

Appendix to report:

SBJ-33-C5-OON-22-RE-018
DESIGN OF PONTOONS AND COLUMNS

Appendix title:

APPENDIX B – ABAQUS RESULTS ULS

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CONCEPT DEVELOPMENT FLOATING BRIDGE E39 BJØRNAFJORDEN

Norconsult 

 DR. TECHN.
OLAV OLSEN

 Prodtex
Production / Technology / Excellence

 IFE

 Pure Logic
The science of production reasoning

 HEYERDAHL ARKITEKTER AS

 H&BB

 MIKO
MARINE AS

 BUKSÉR og
BERGING

 FORCE
TECHNOLOGY

 SWERIM

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1 DESCRIPTION

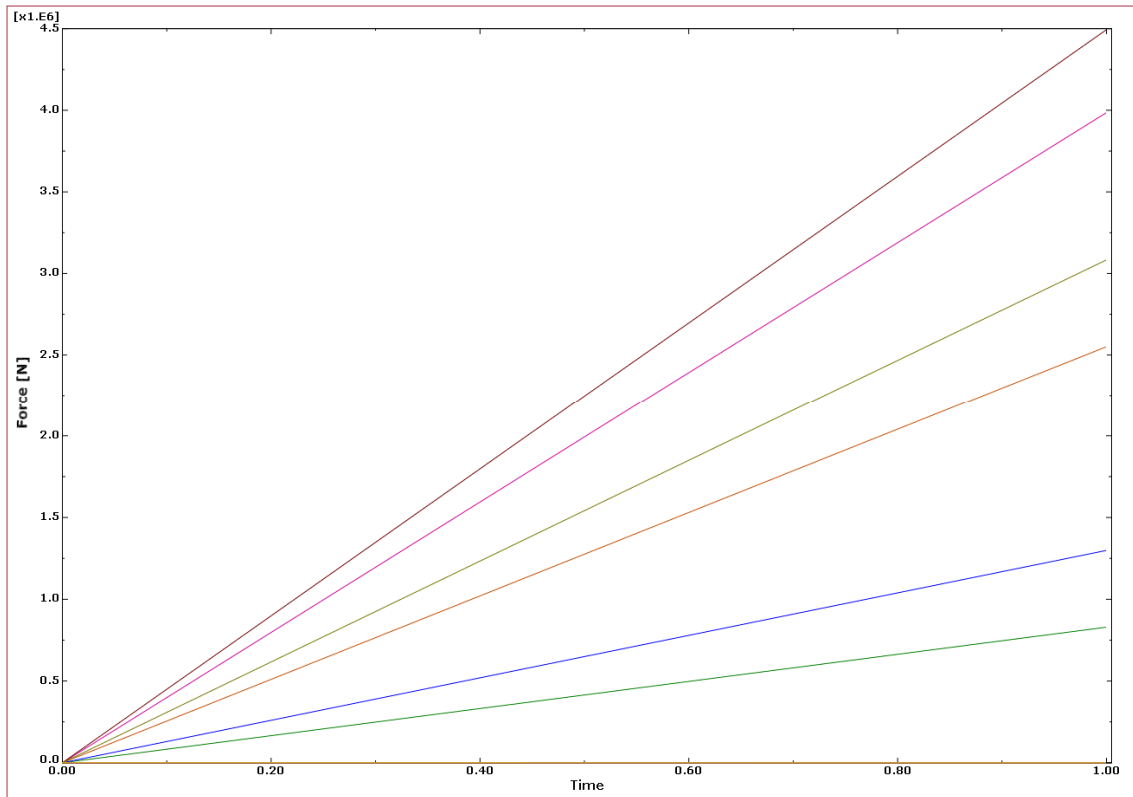
ULS1 = ULS cases where the wave is applied so that maximum quasi-static pontoon moment will occur with wave crest or wave bottom at pontoon middle point.

ULS2 = ULS cases where the wave is applied so that maximum quasi-static column moment will occur with wave crest or wave bottom at $\frac{1}{4}$ of the pontoon length and the corresponding opposite wave bottom or wave crest at $\frac{3}{4}$ of the pontoon length.

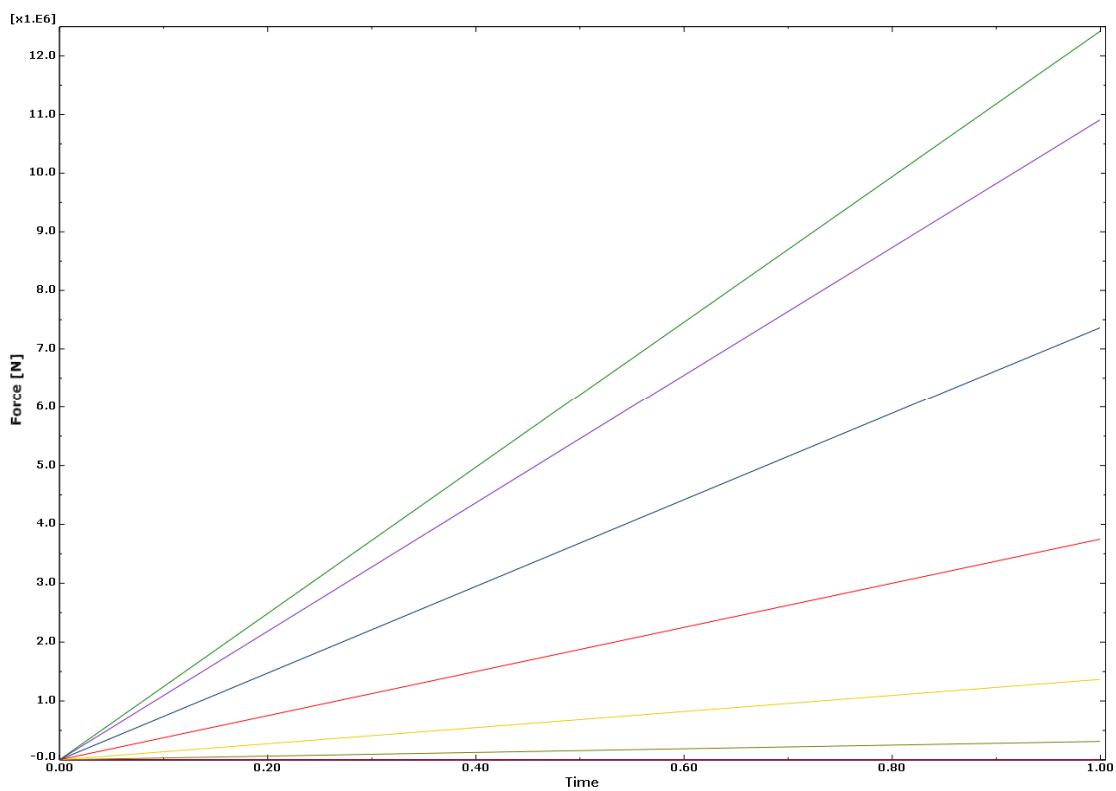
0-90 deg = angle of wave application, 0 degrees pointing at pontoon longitudinal axis.

The following sections show analysis results for all wave directions.

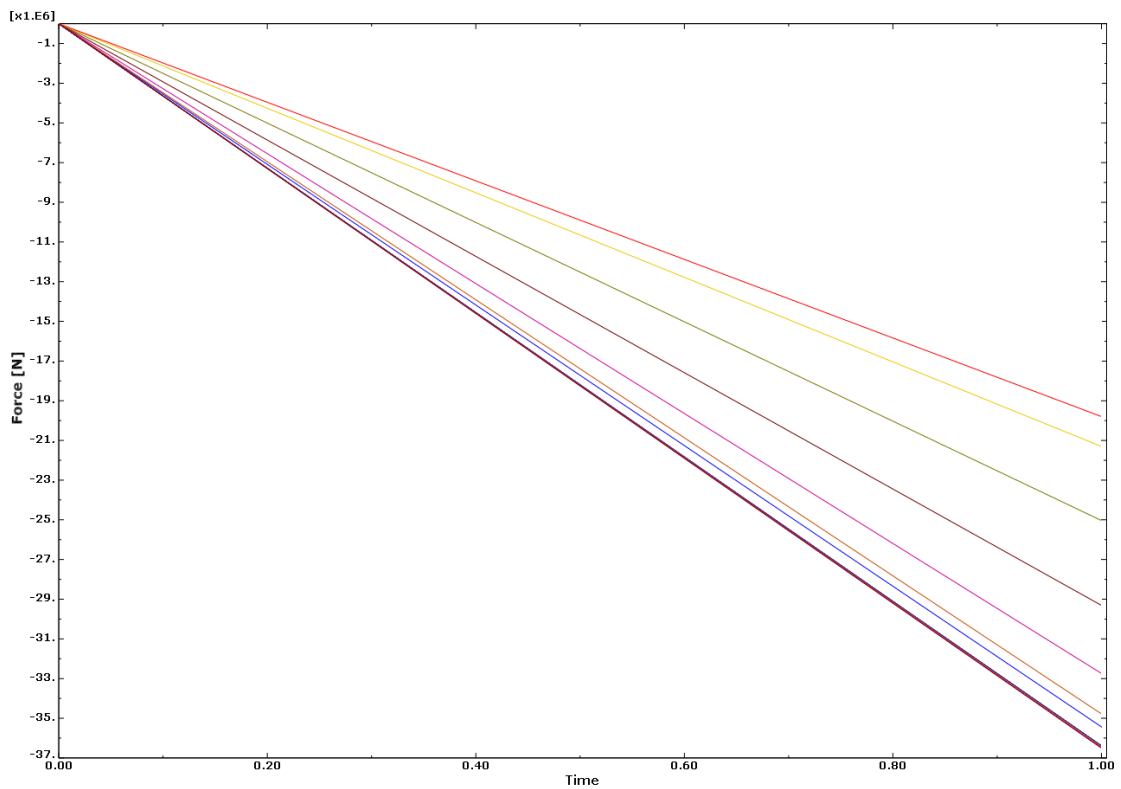
2 REACTION FORCES AND MOMENTS



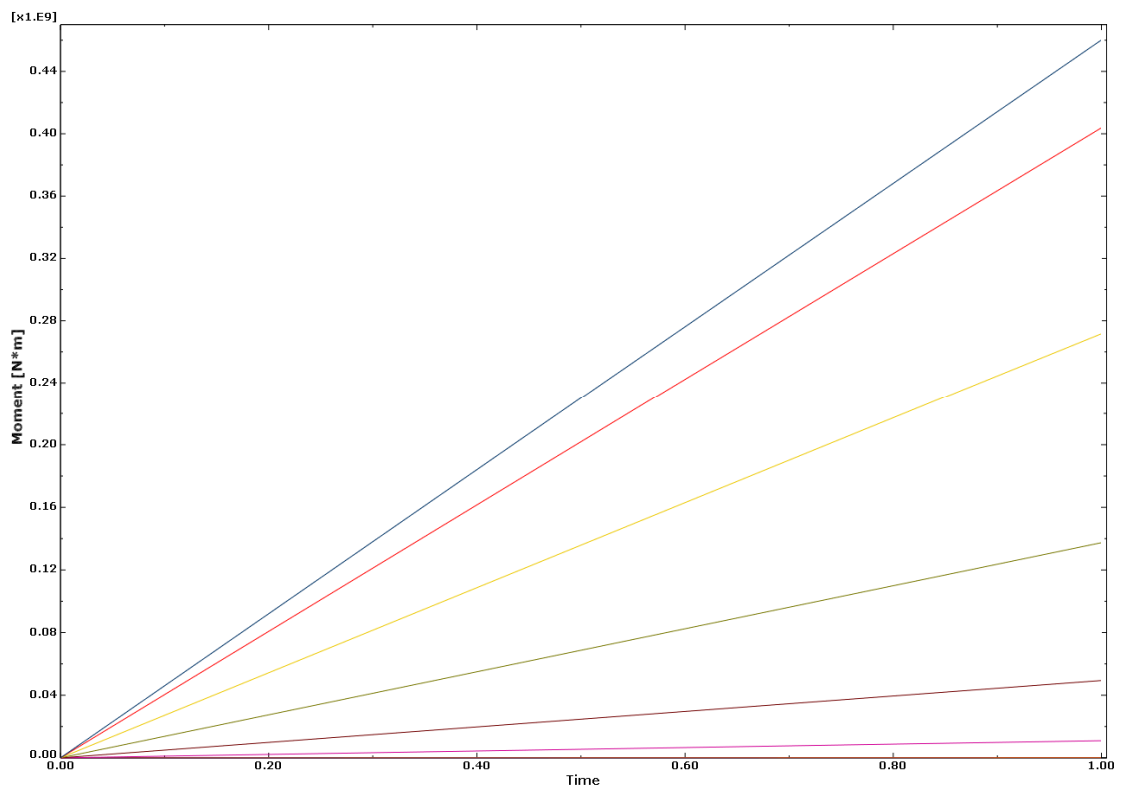
- > Figure 2-1 Reaction force in pontoon longitudinal direction at column top for all wave directions, max 4.5 MN (78% of max shear force F_y in column top from global analyses).



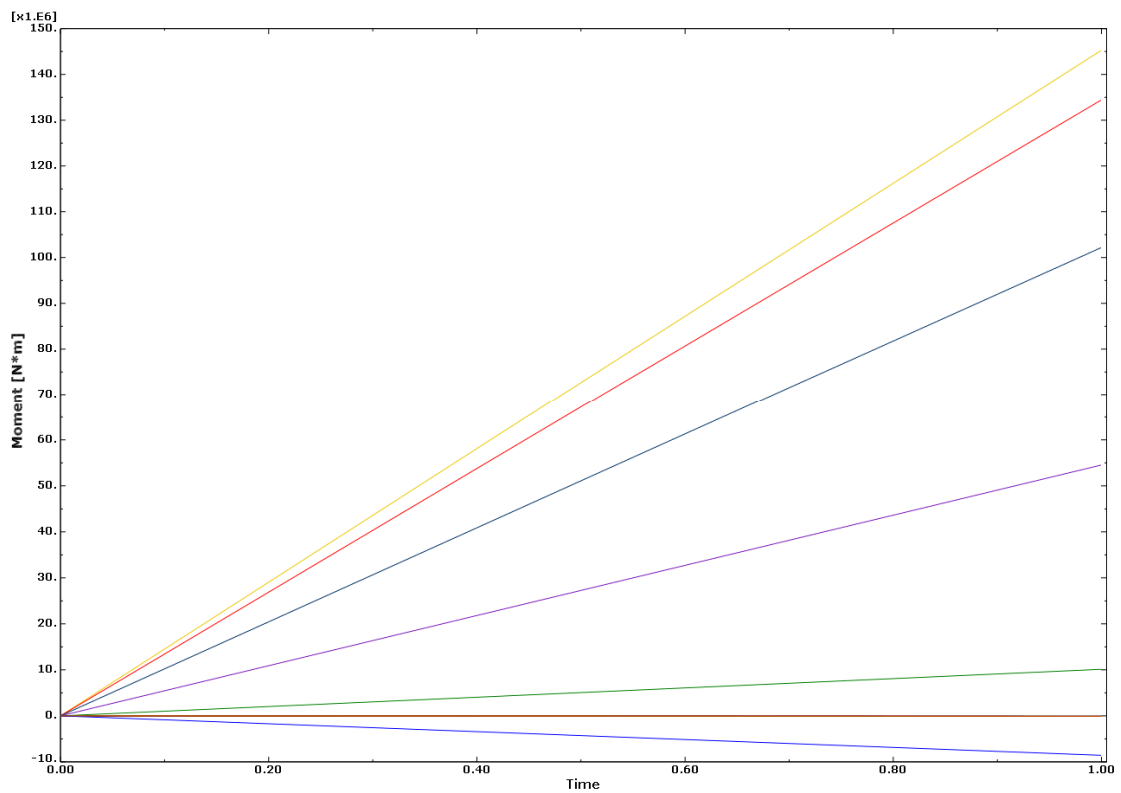
- > *Figure 2-2 Reaction force in pontoon transverse direction at column top for all wave directions, max 12.5 MN (124% of max shear force Fz in column top from global analyses).*



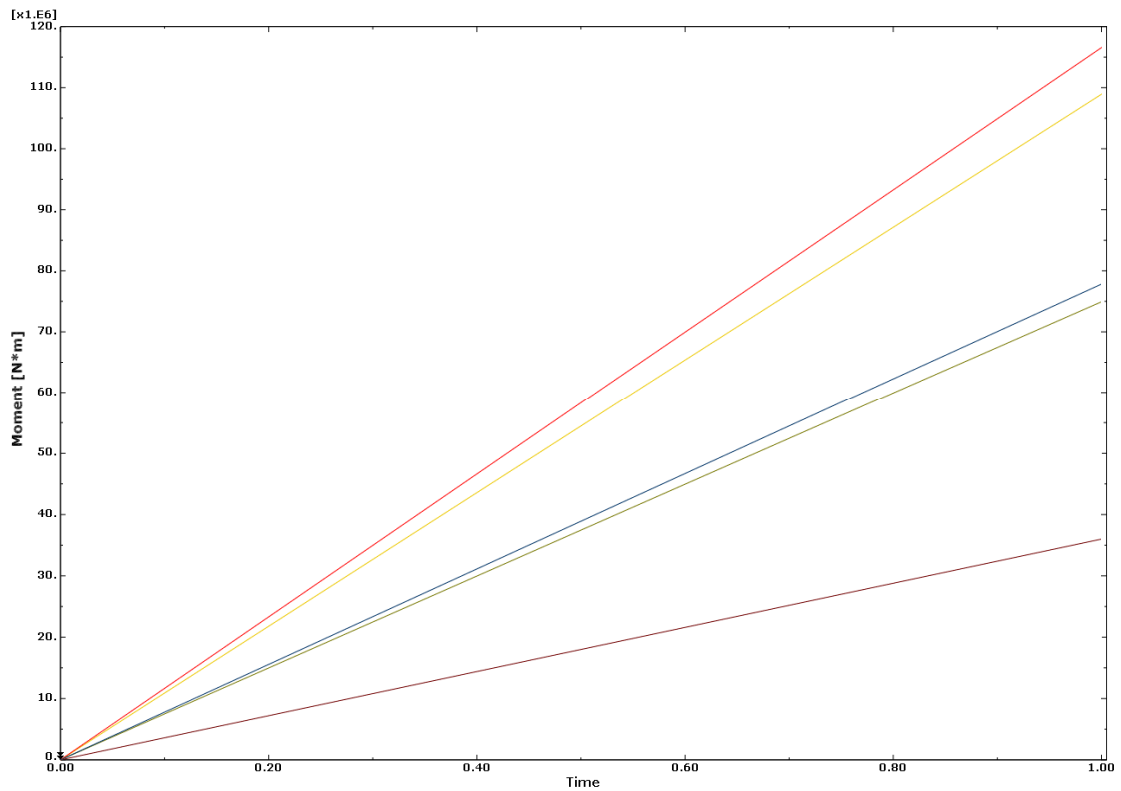
- > Figure 2-3 Reaction force in pontoon vertical direction at column top for all wave directions, max 37 MN (94% of max axial force F_x in column top from global analyses).



- > Figure 2-4 Reaction moment about pontoon longitudinal axis at column top for all wave directions, max 460 MNm (130% of max weak axis bending moment in column top from global analyses).

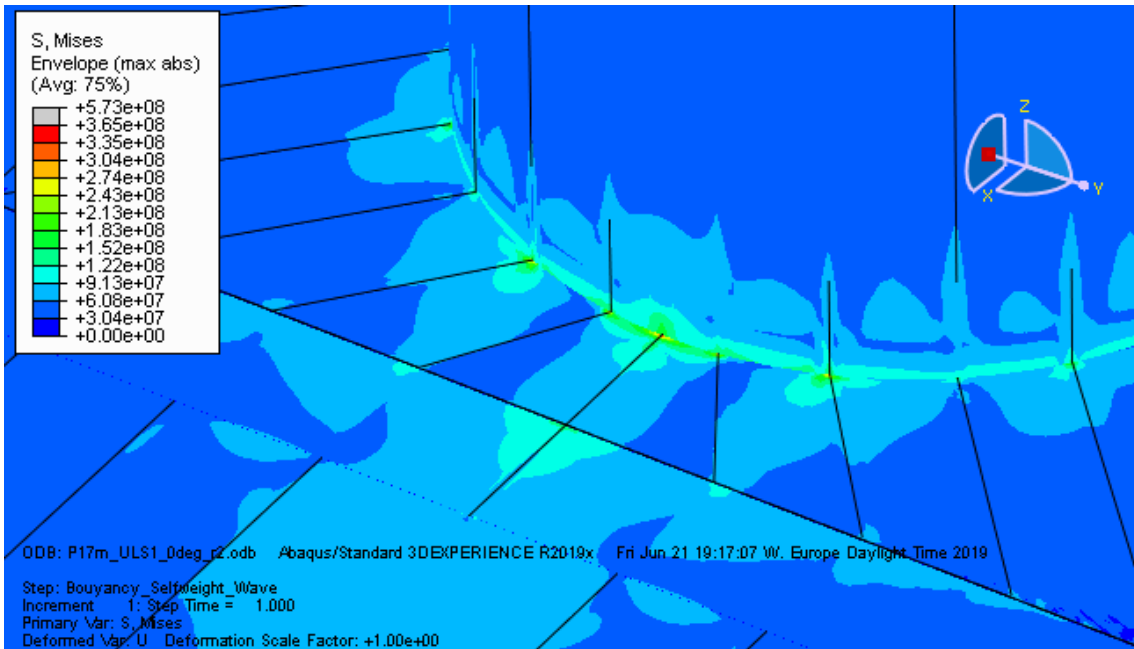
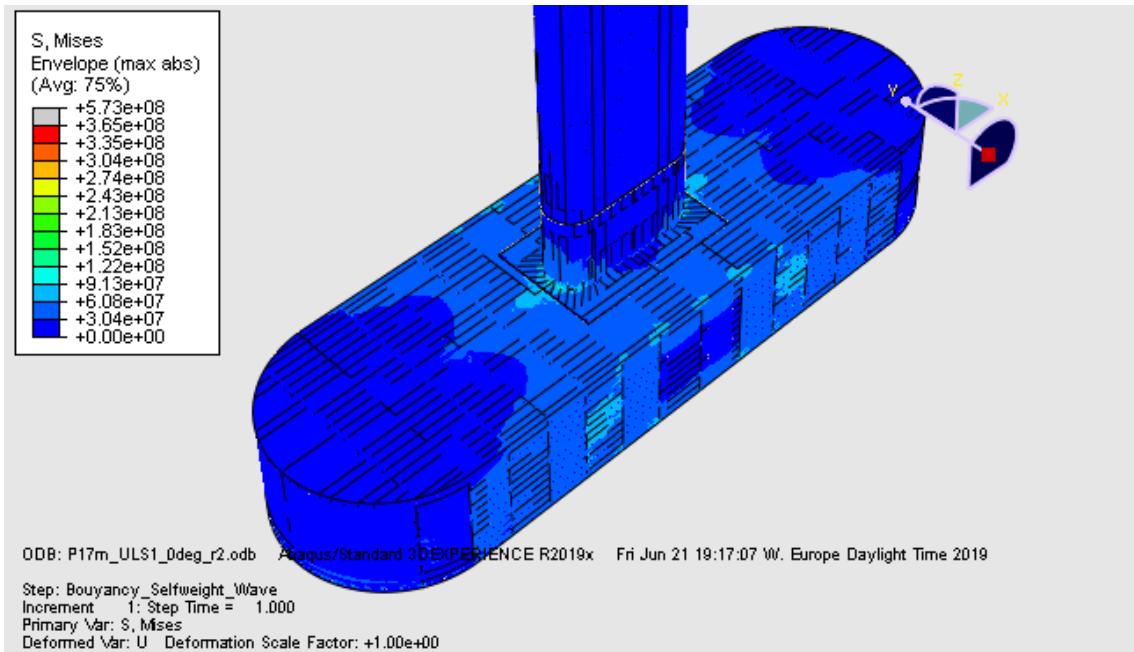


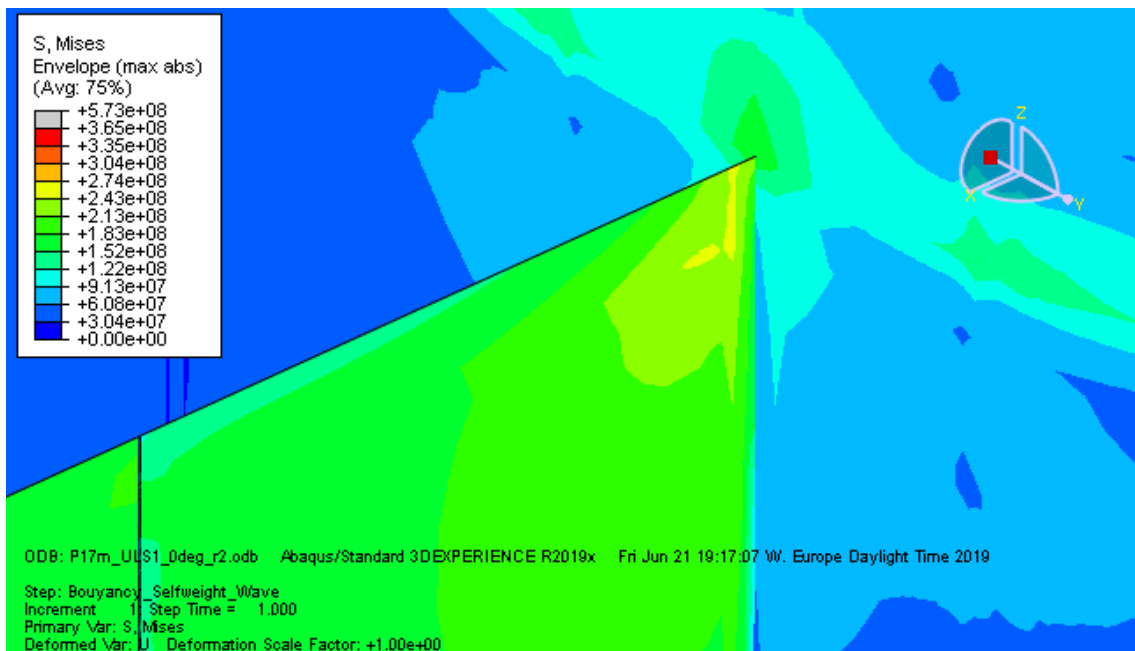
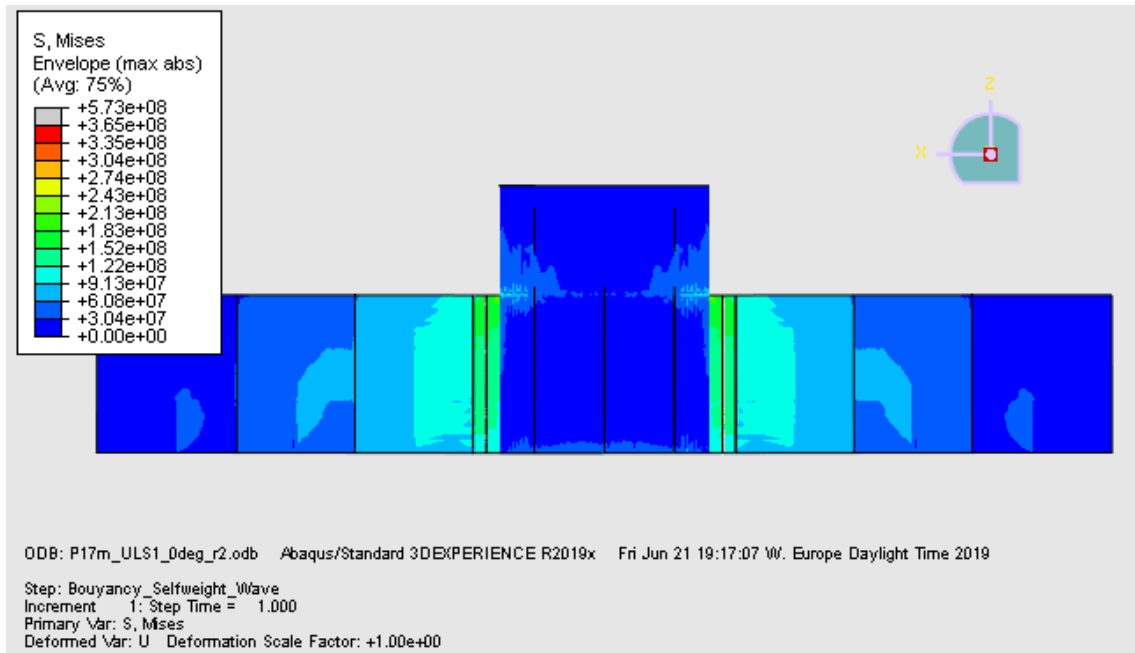
- > Figure 2-5 Reaction moment about pontoon transverse axis at column top for all wave directions, max 145 MNm (89% of max strong axis bending moment in column top from global analyses).



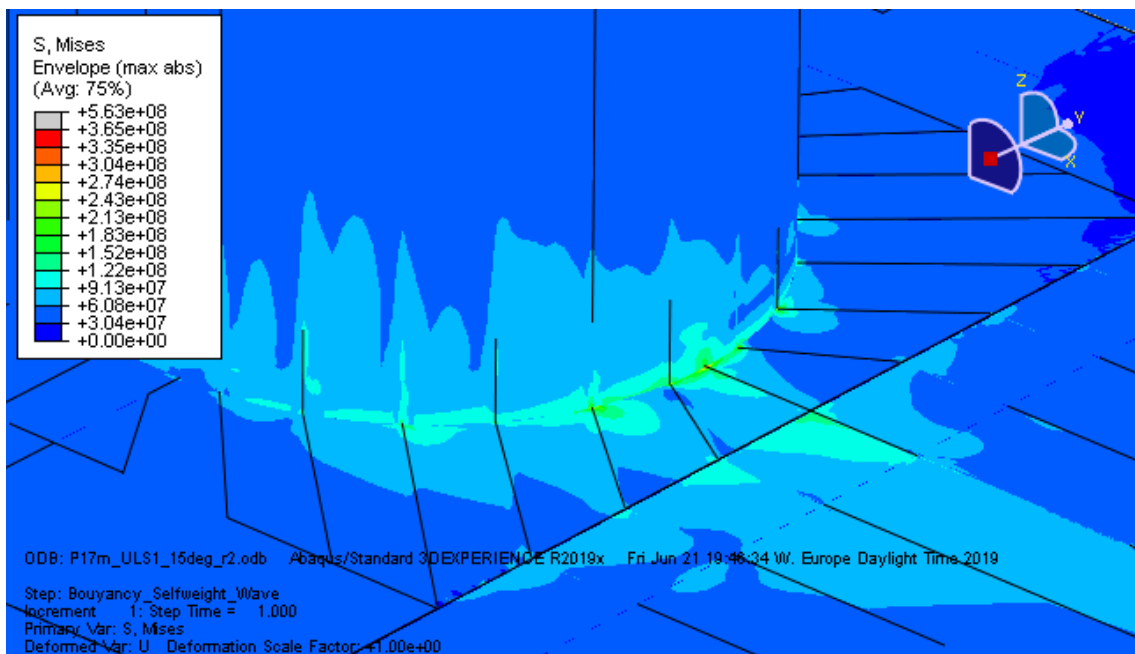
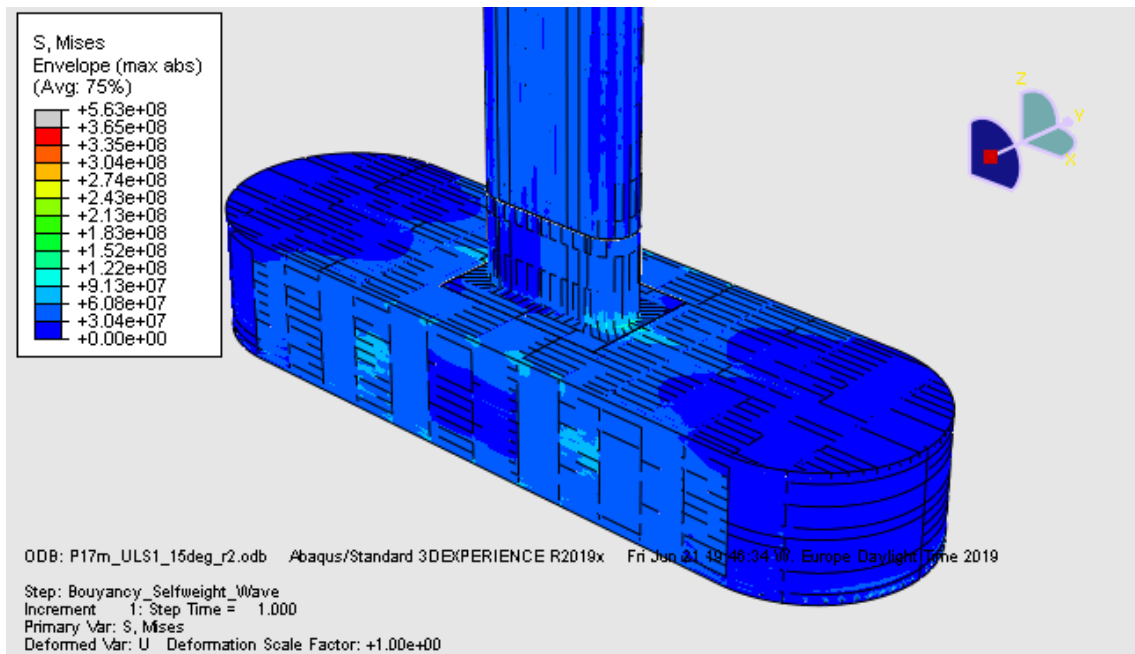
- > Figure 2-6 Reaction moment about pontoon vertical axis, max 117 MNm (152% of max torsional moment in column top from global analyses).

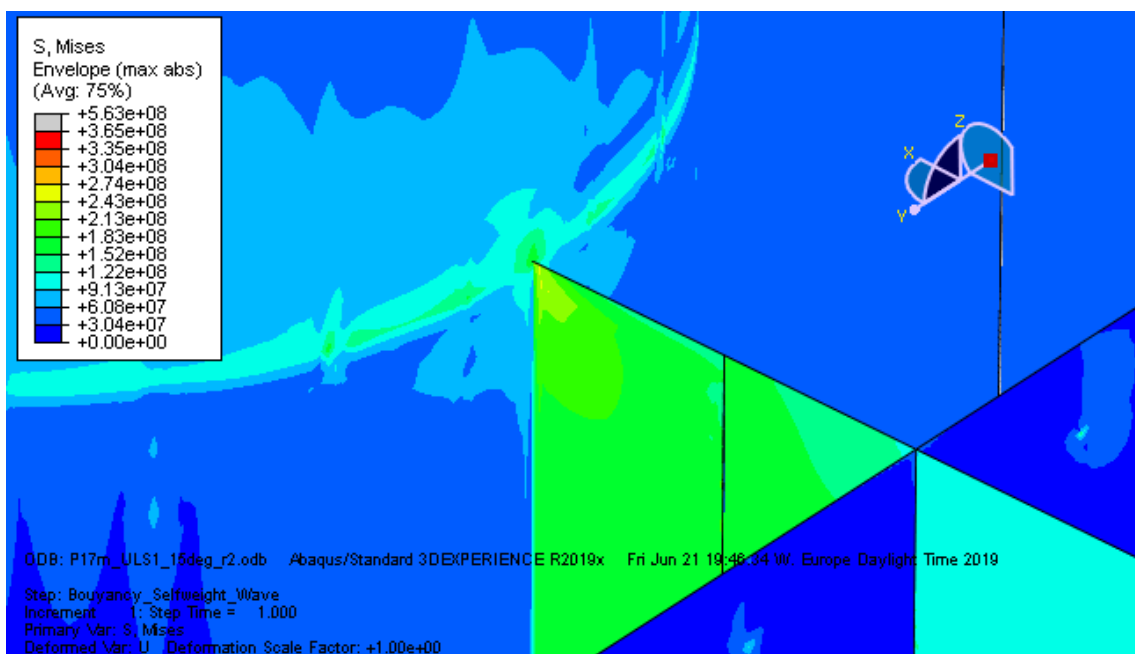
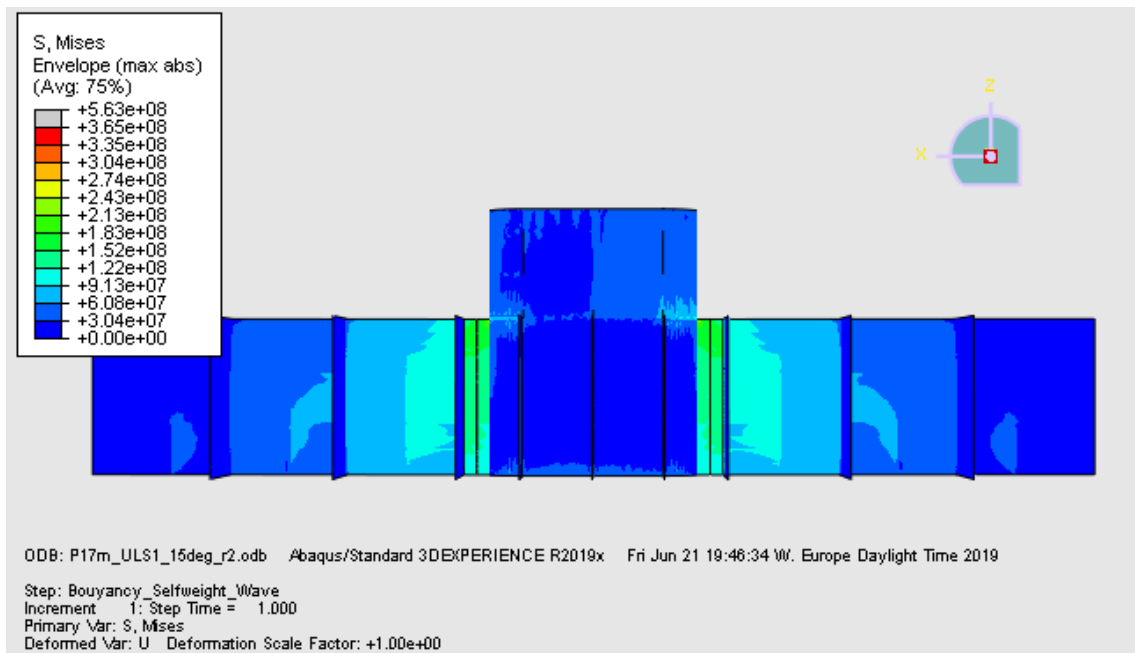
3 ULS 1 0DEG



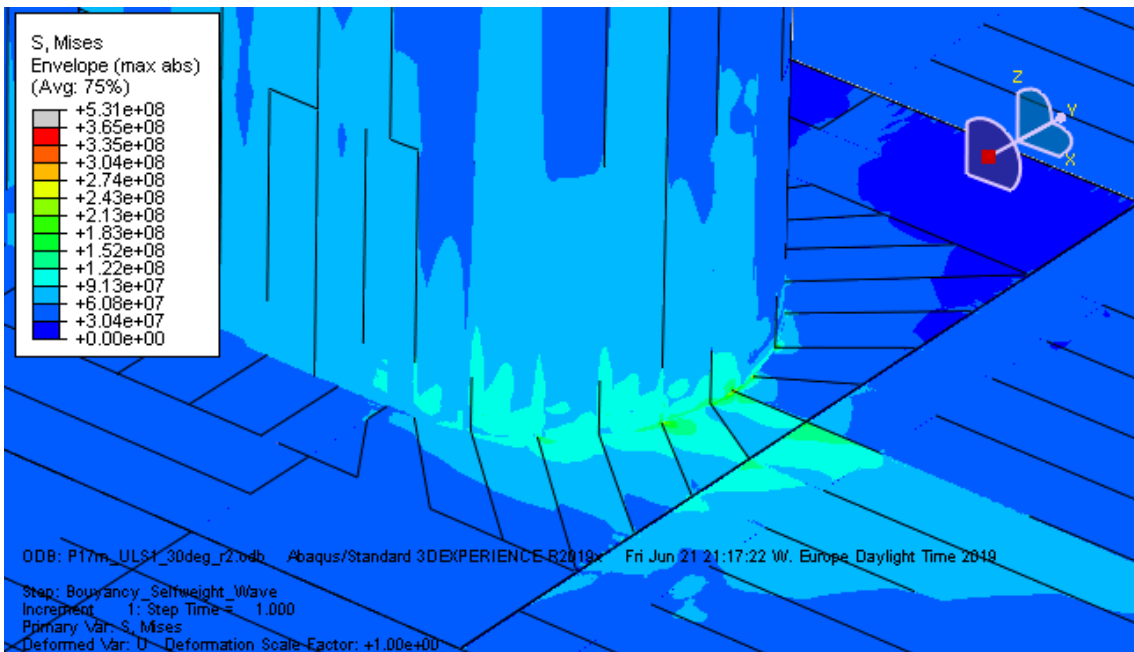
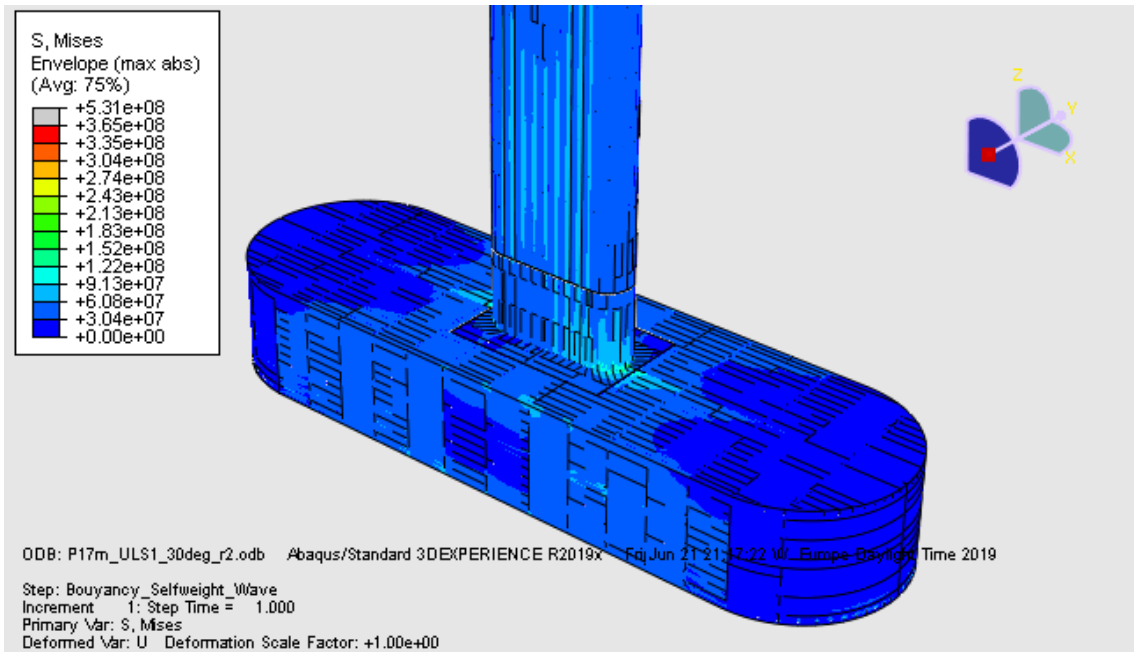


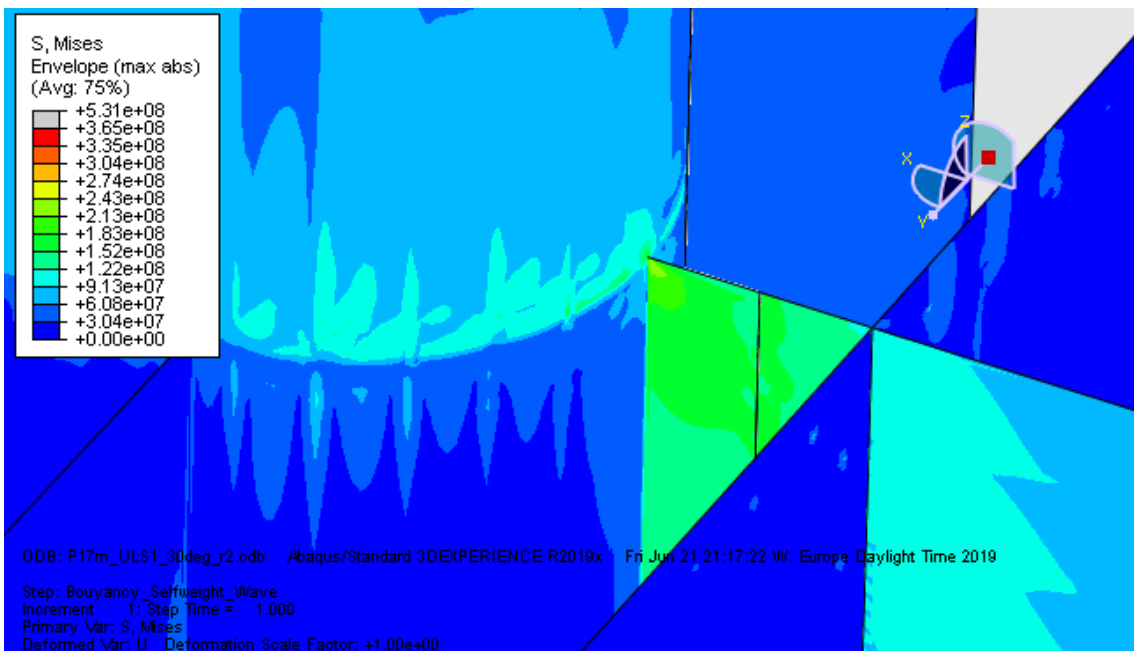
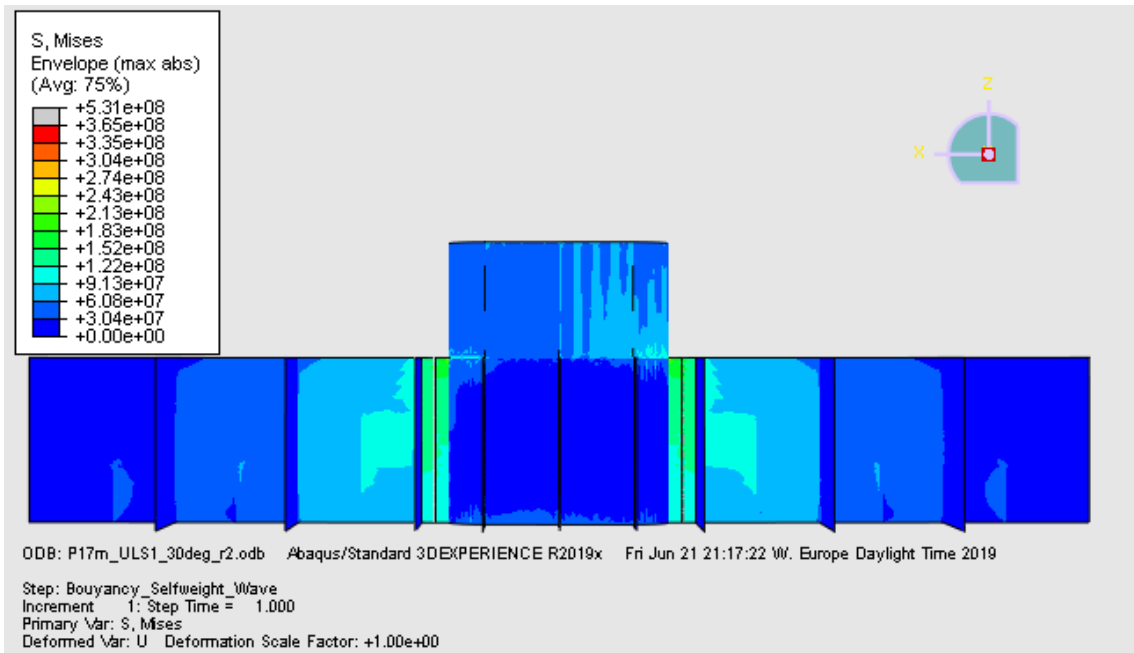
4 ULS 1 15DEG



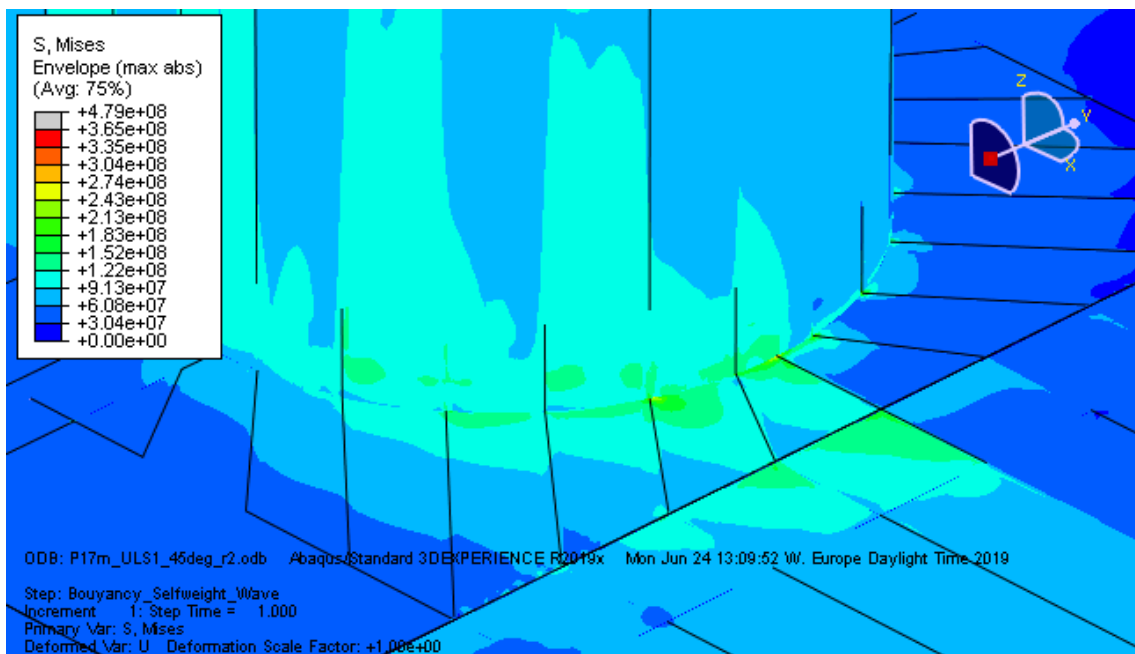
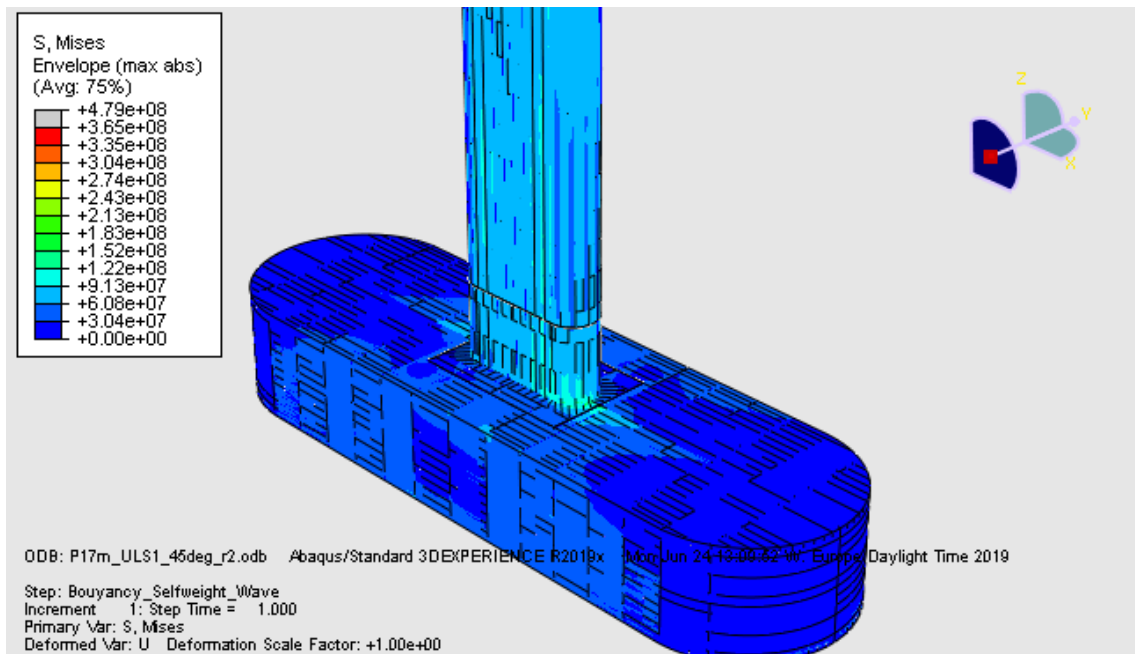


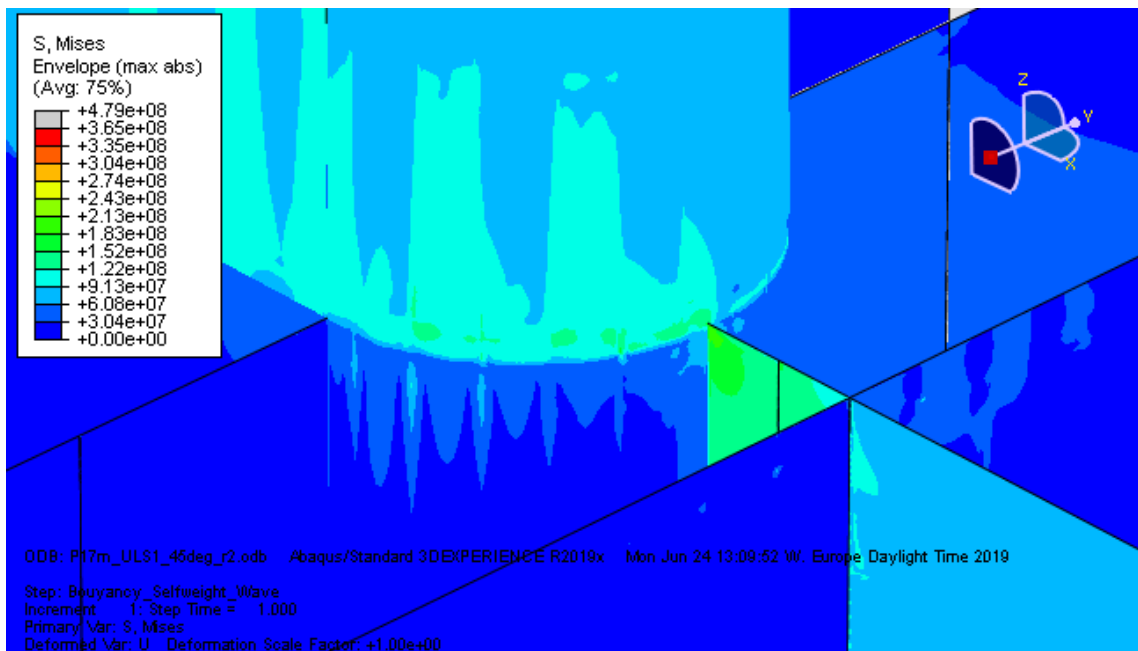
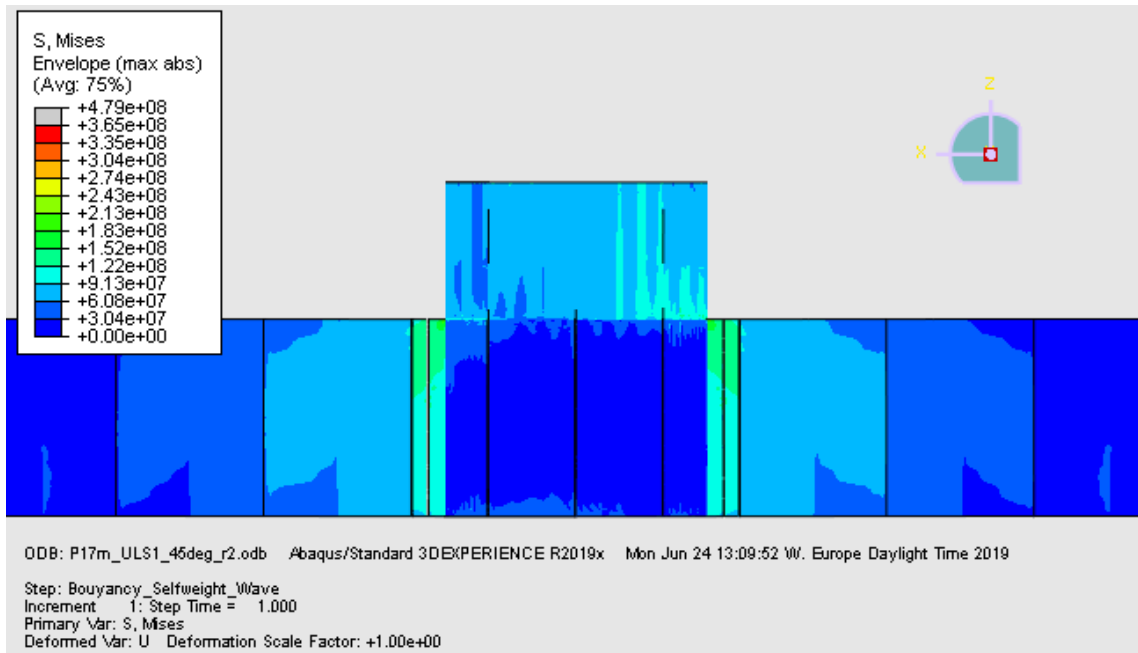
5 ULS 1 30DEG



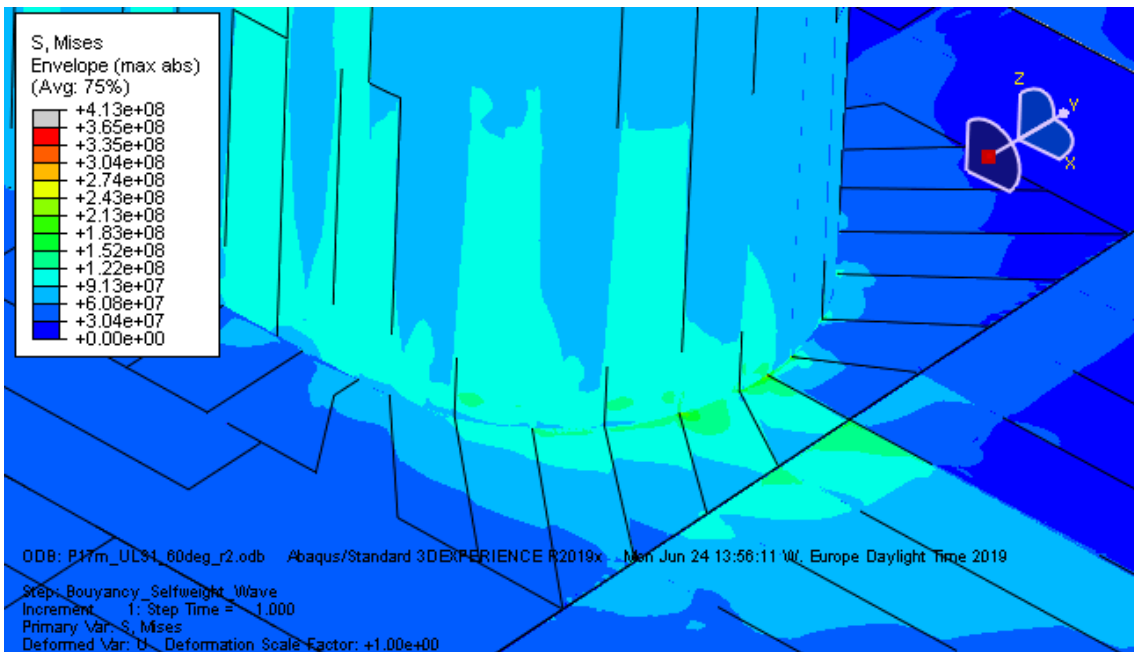
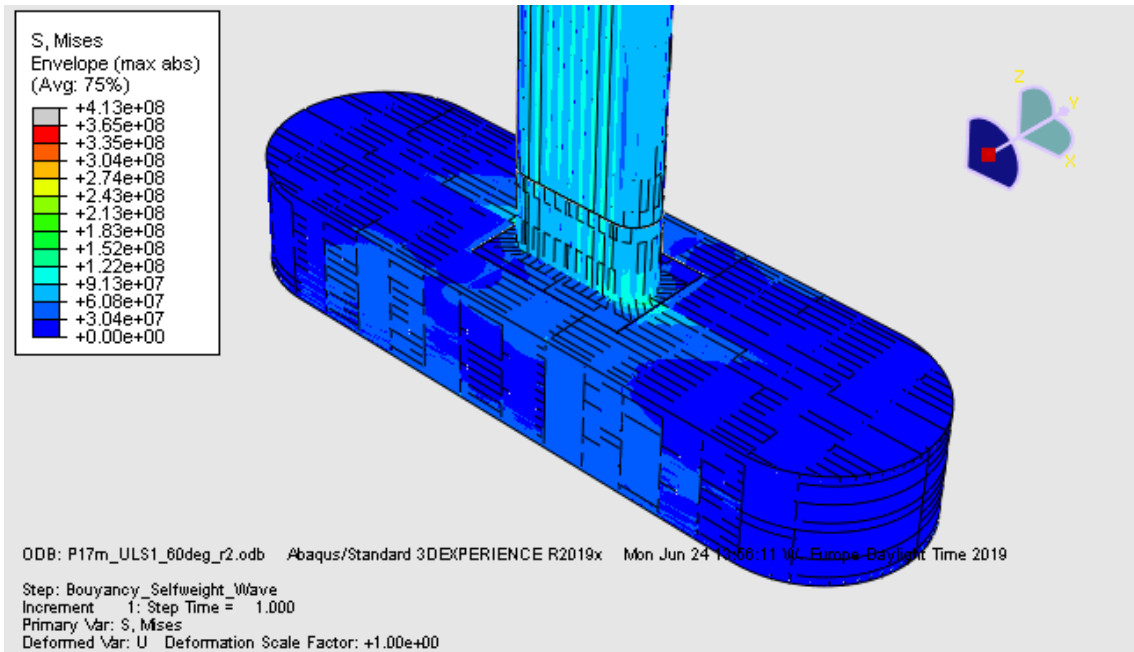


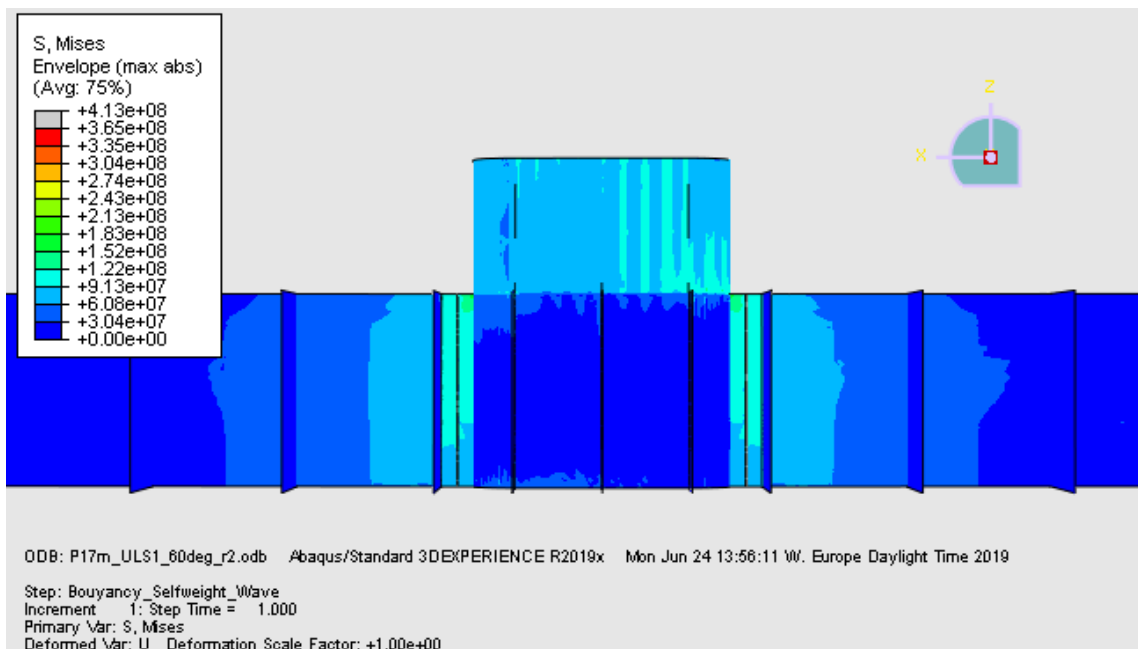
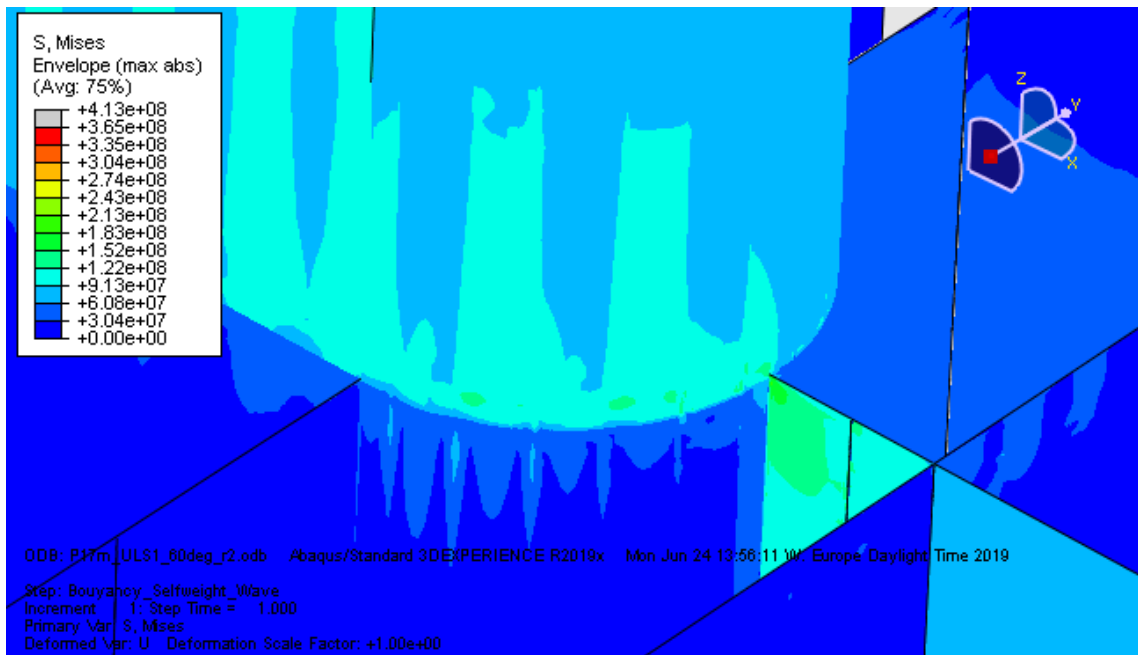
6 ULS 1 45DEG



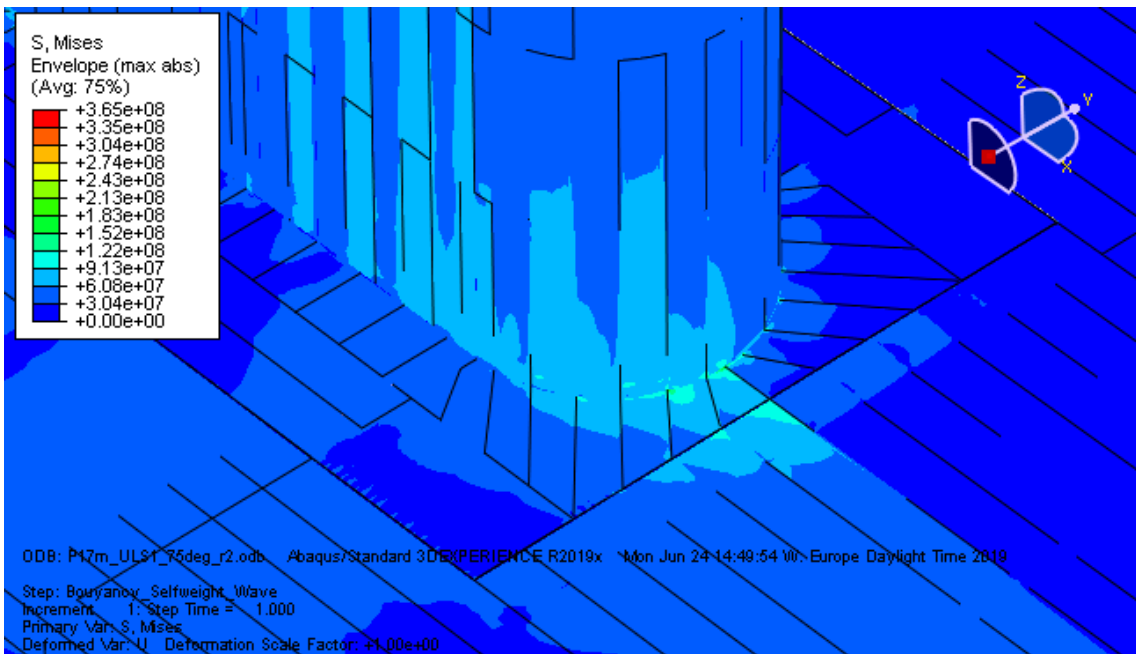
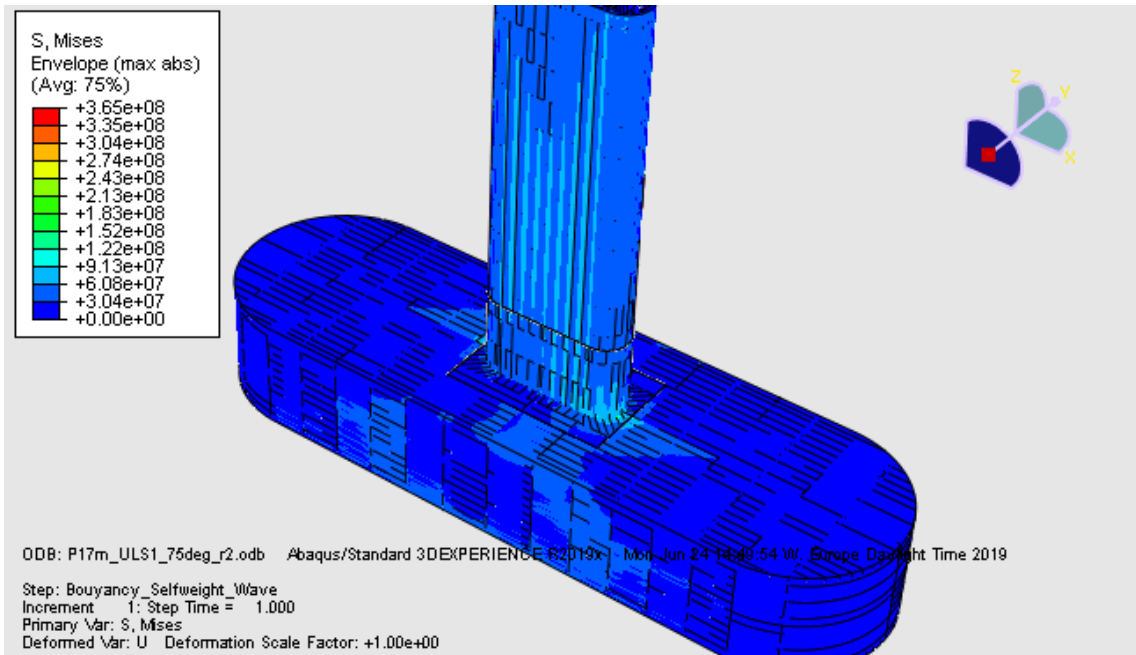


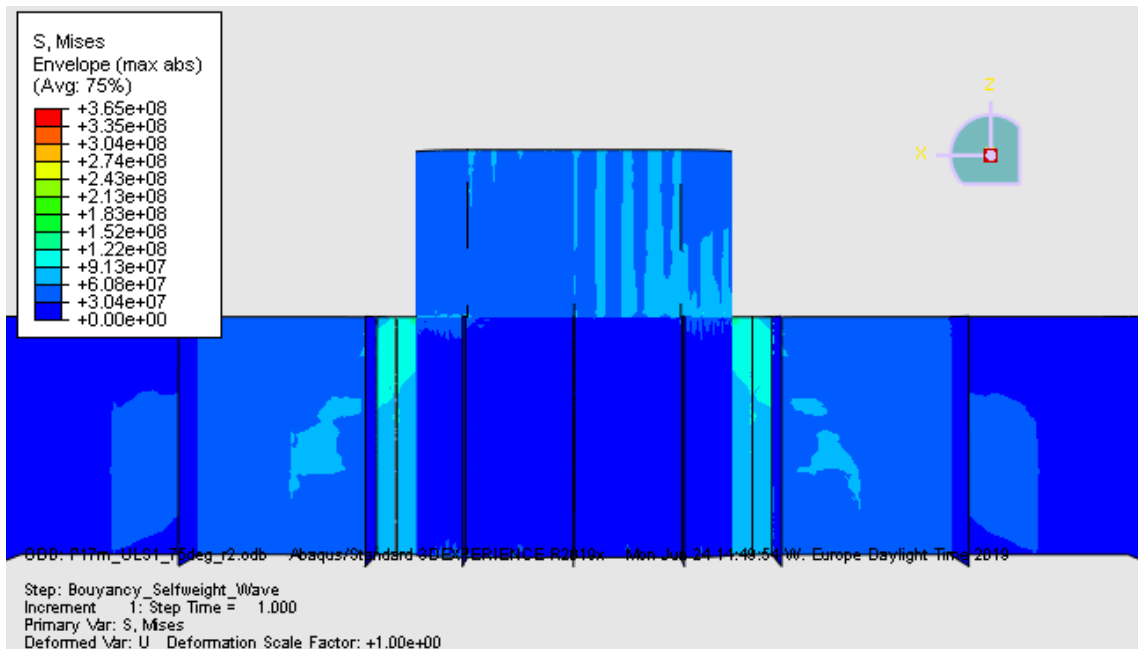
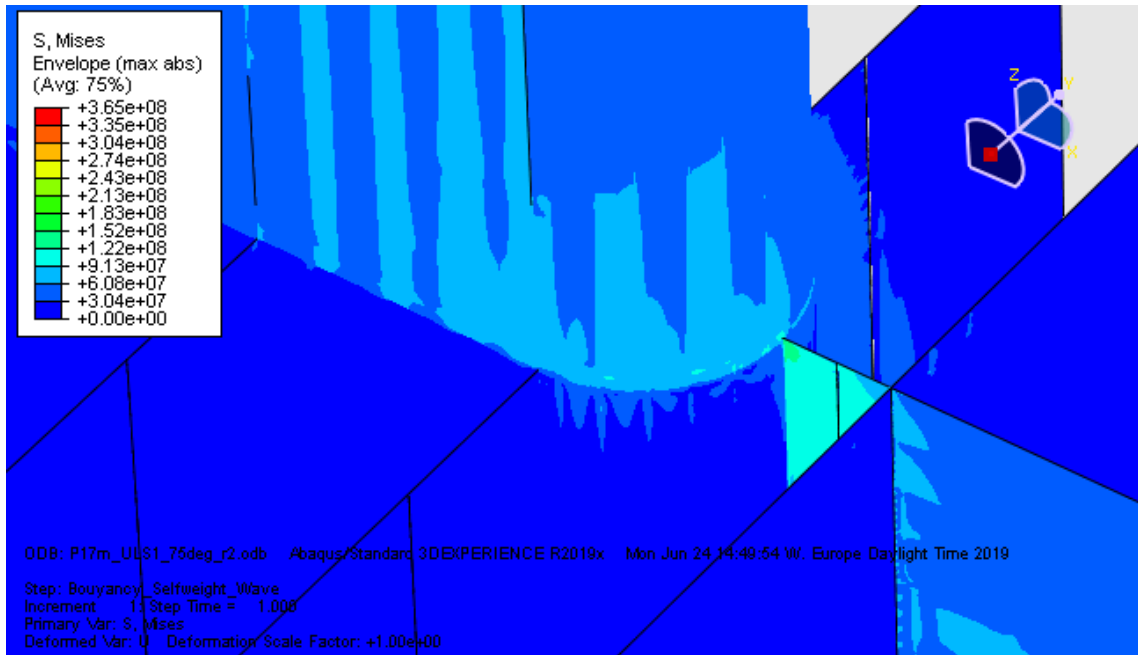
7 ULS 1 60DEG



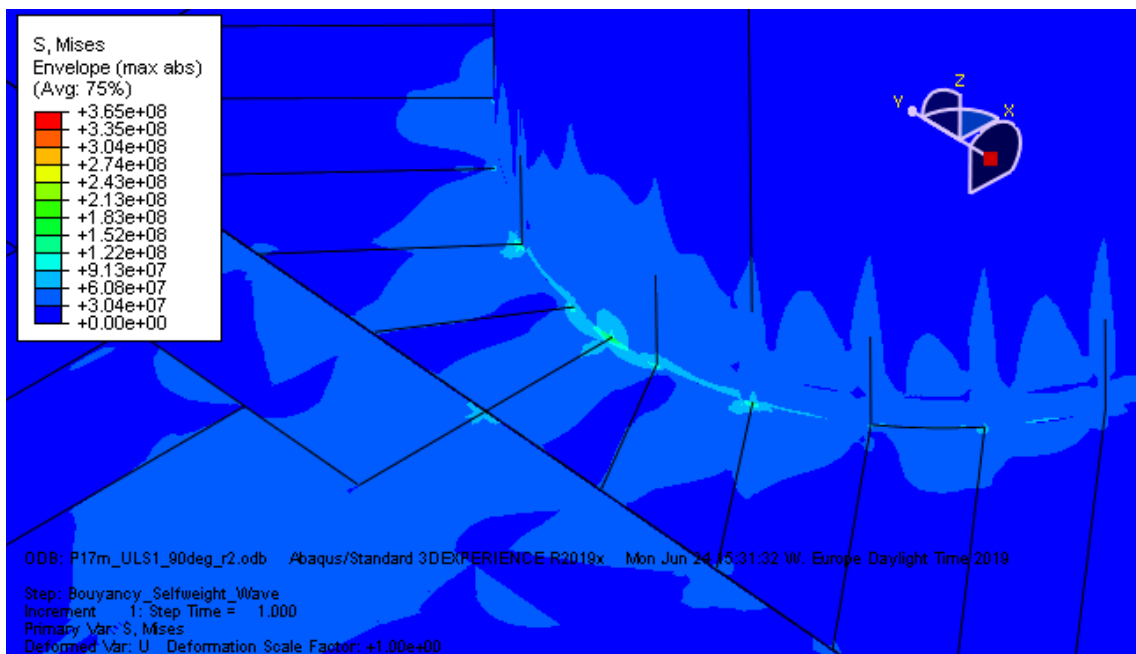
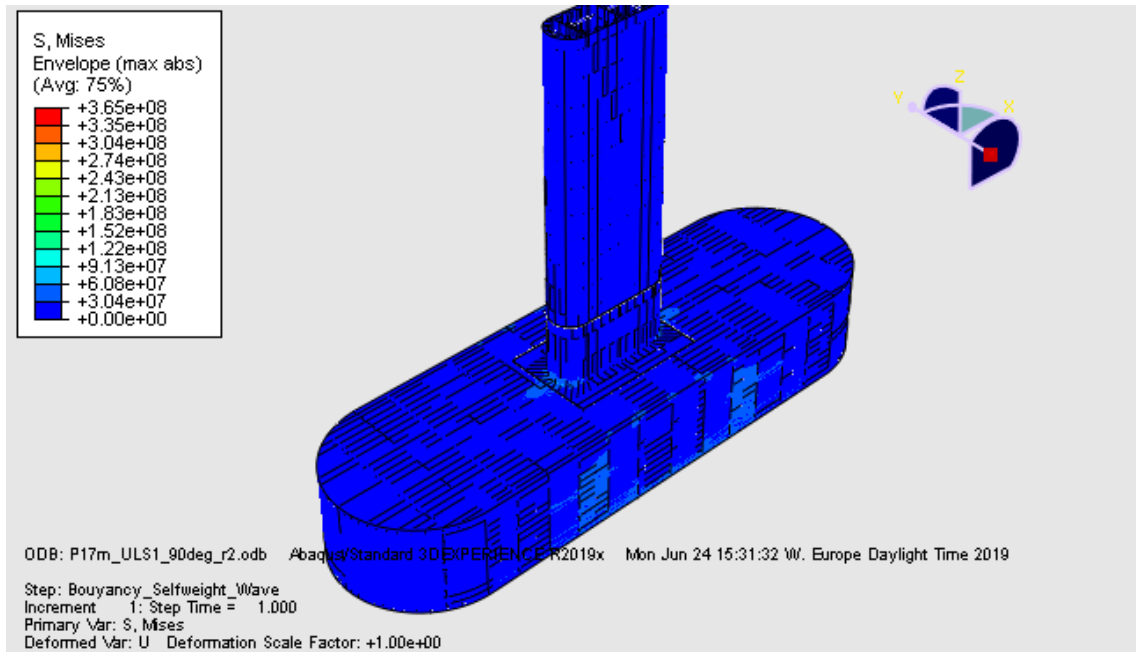


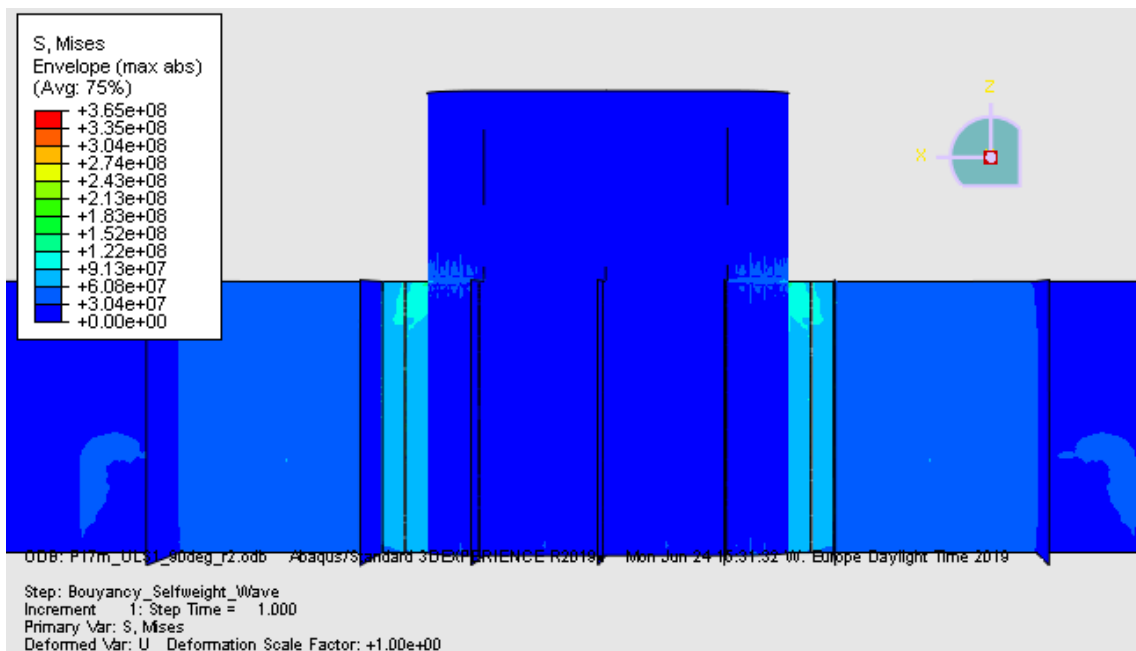
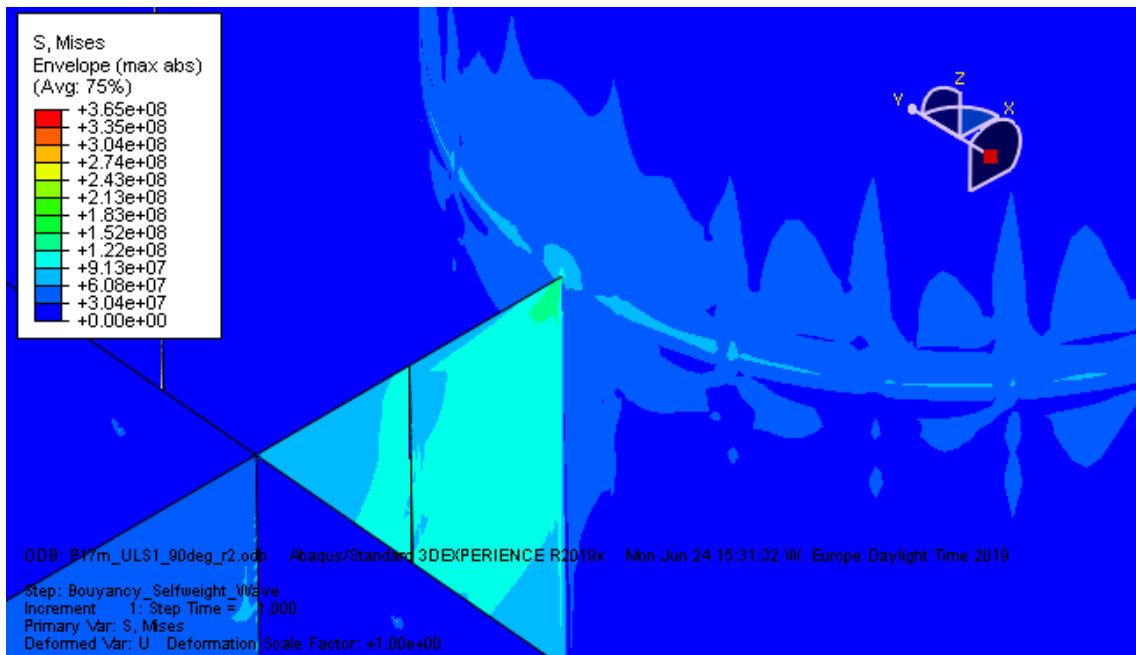
8 ULS 1 75DEG



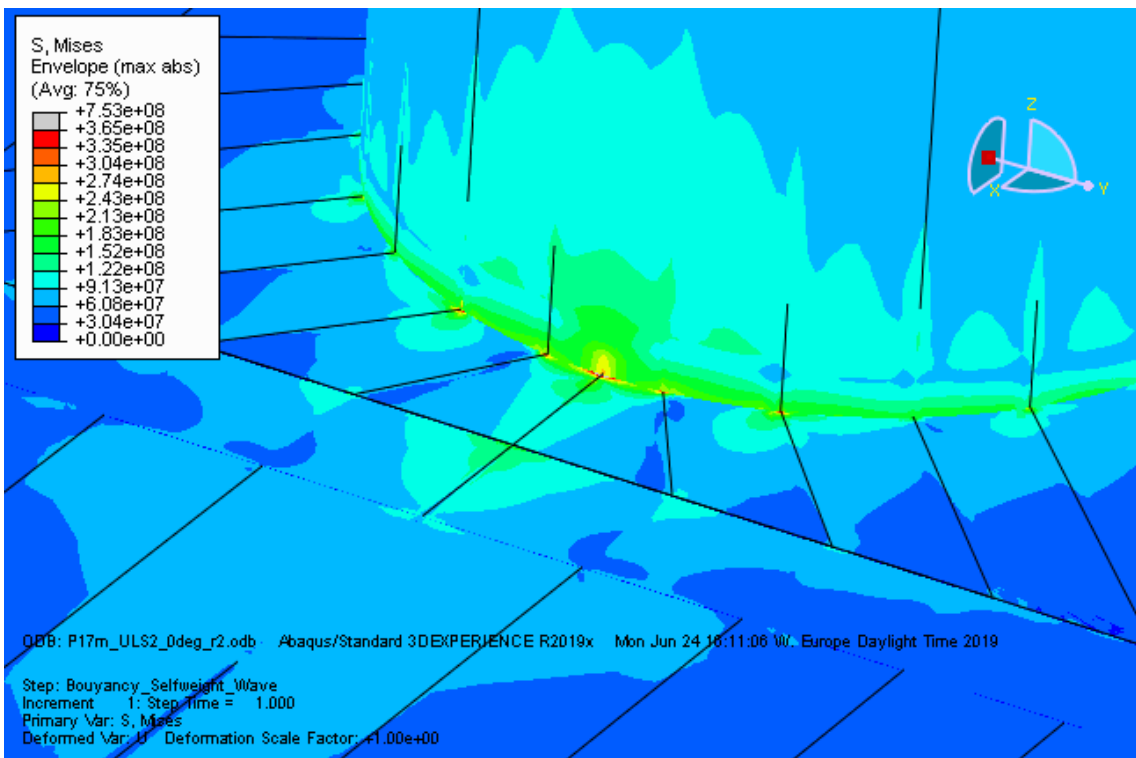
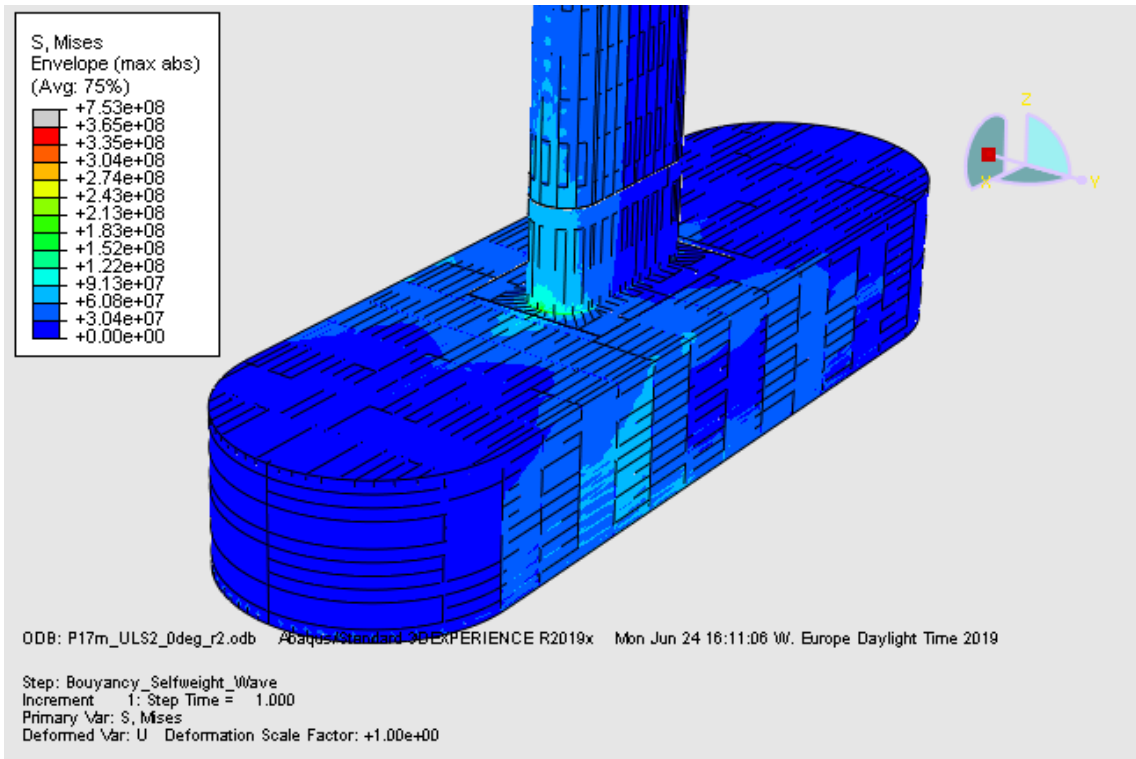


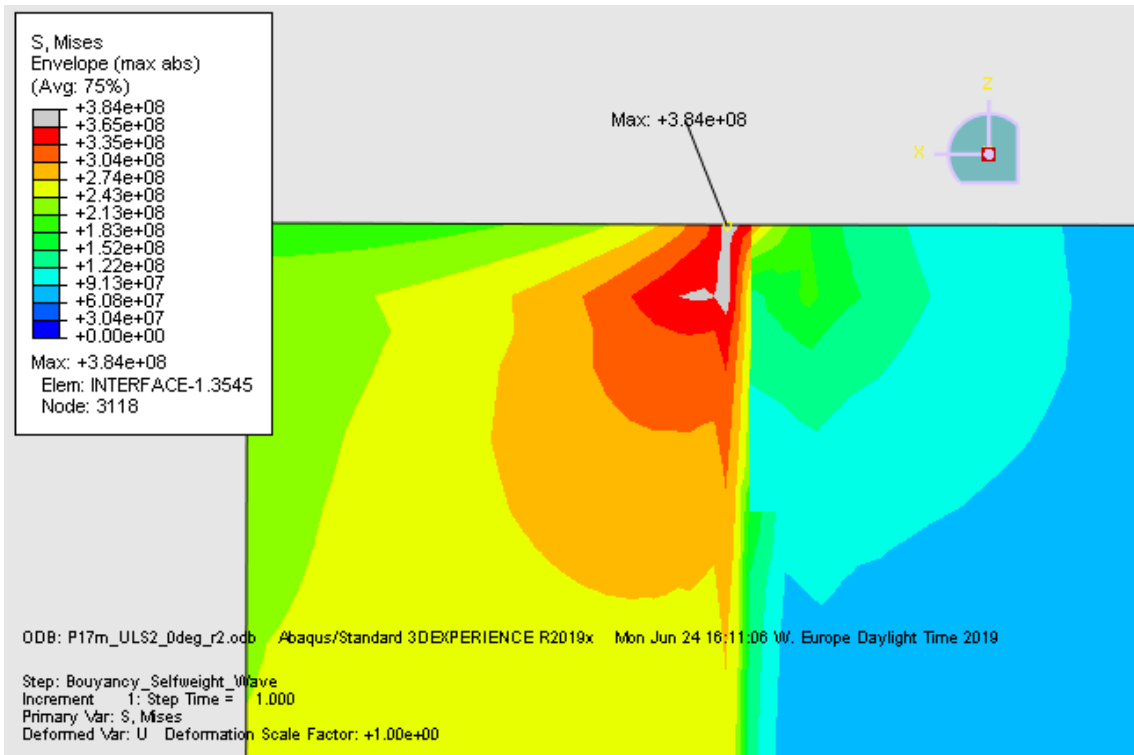
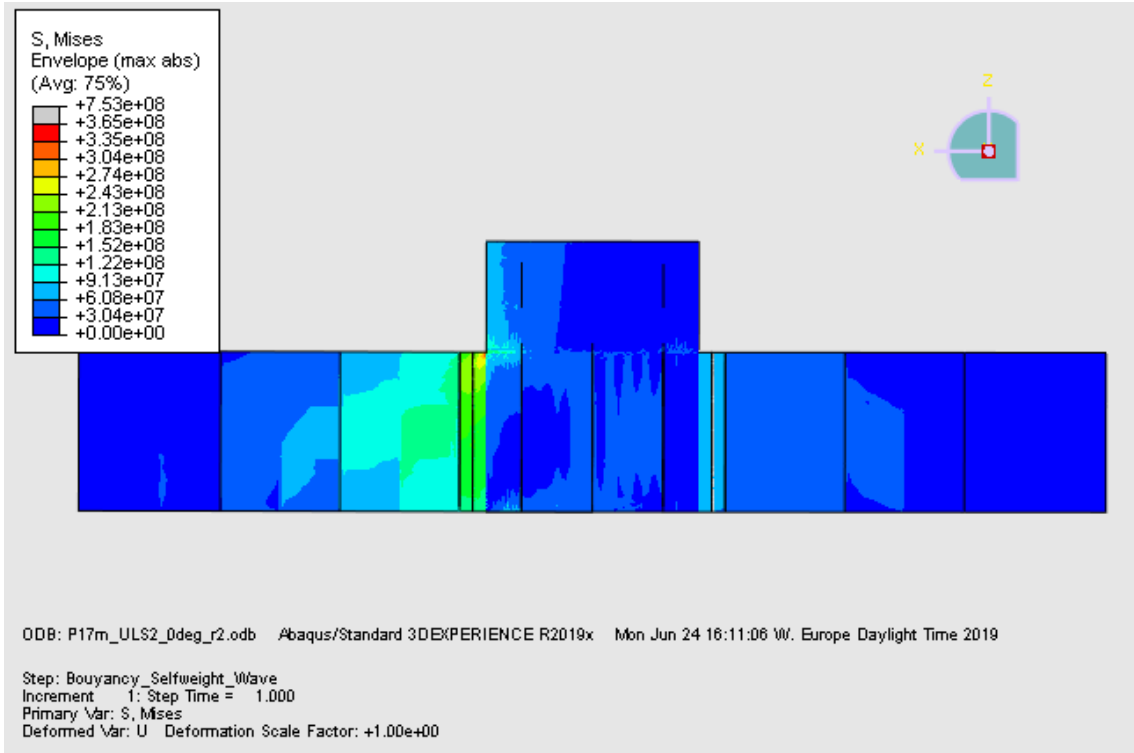
9 ULS 1 90DEG



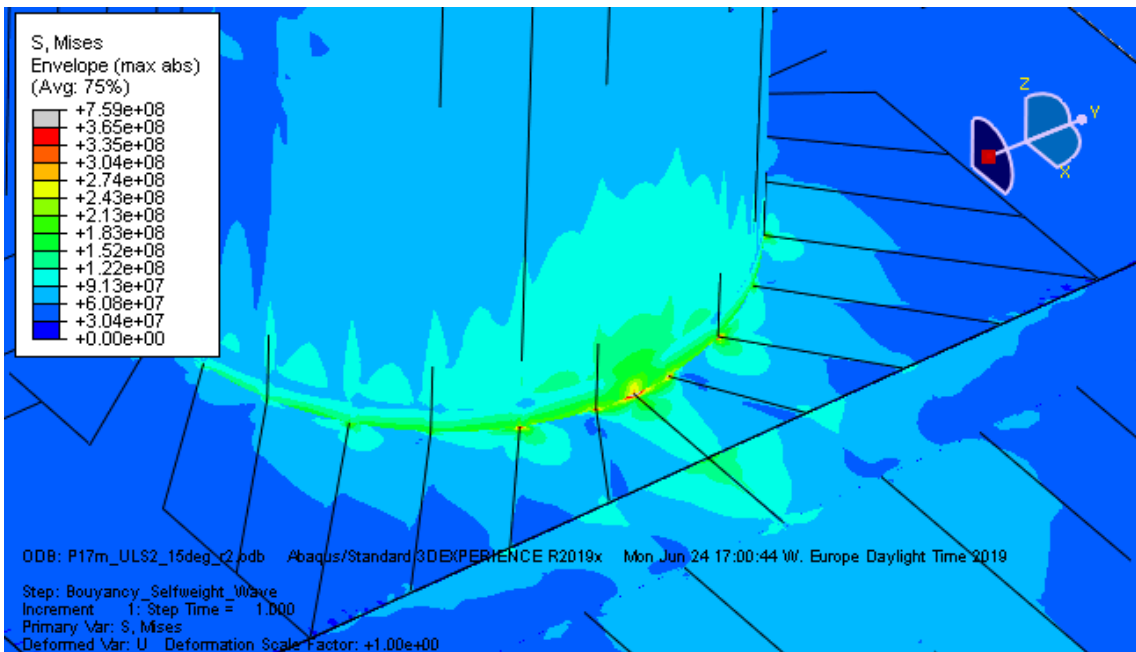
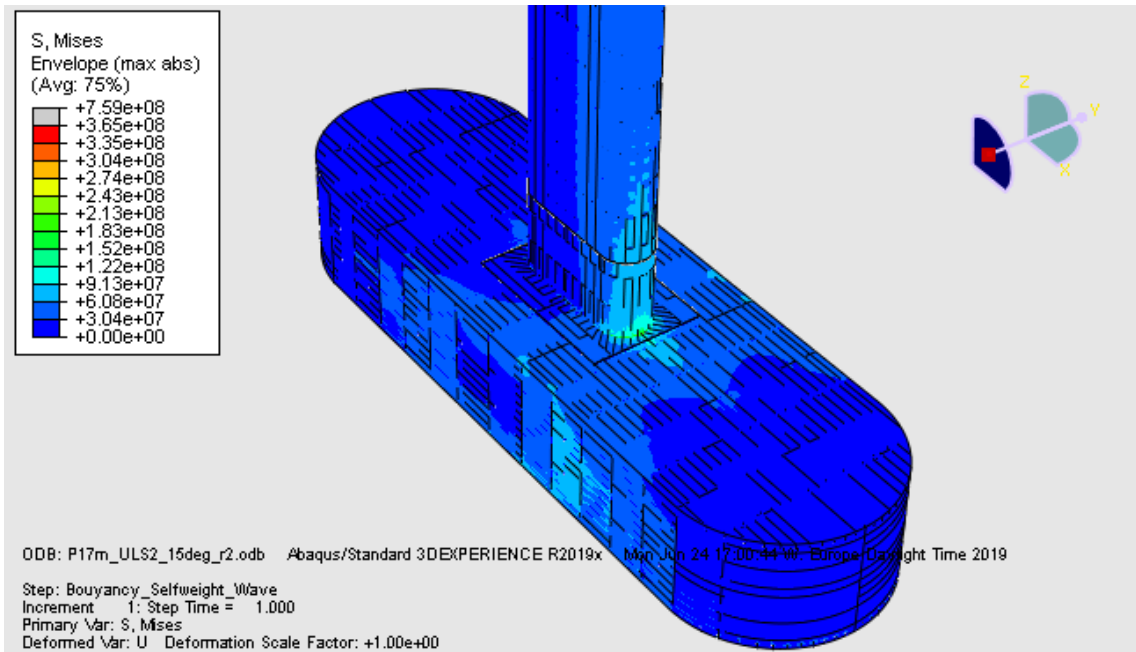


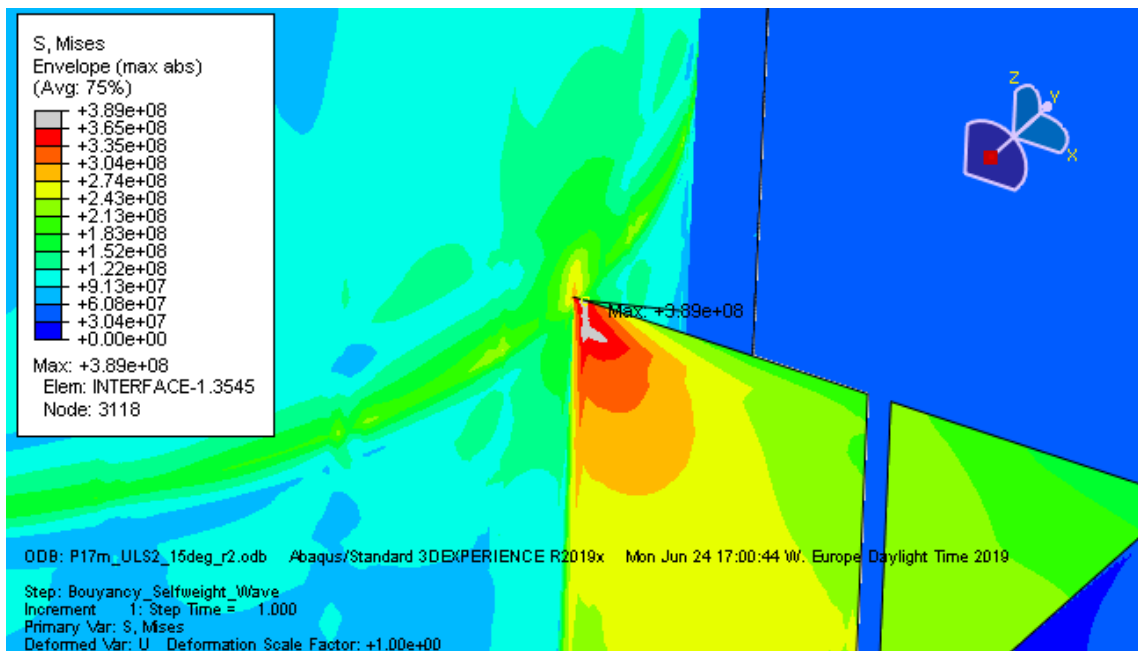
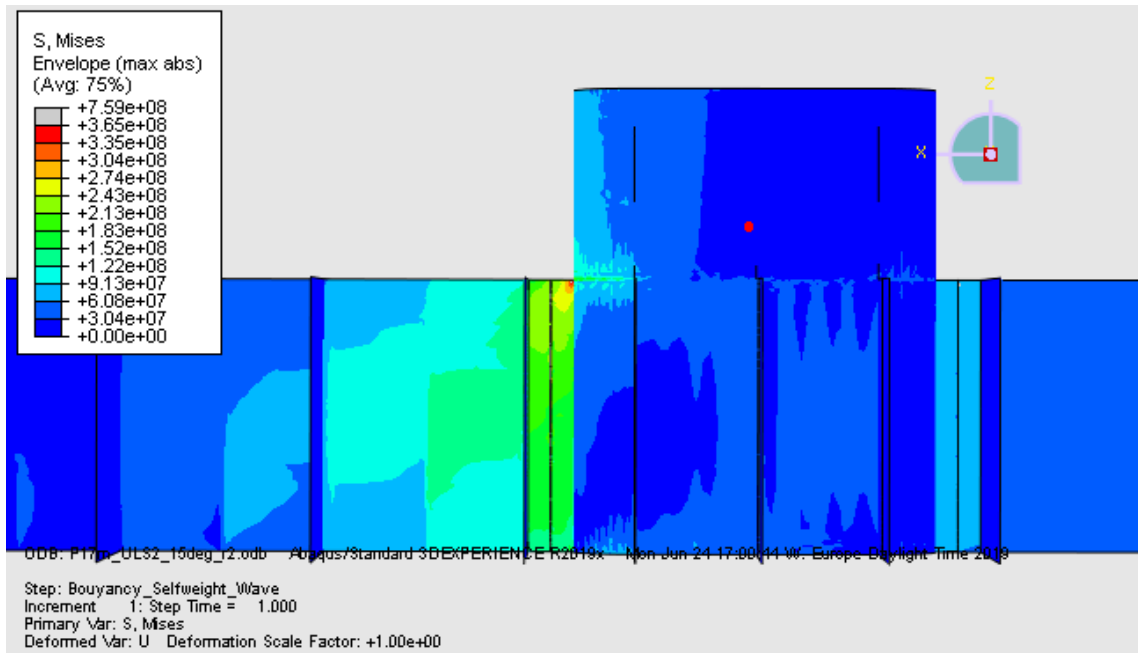
10 ULS 2 0DEG



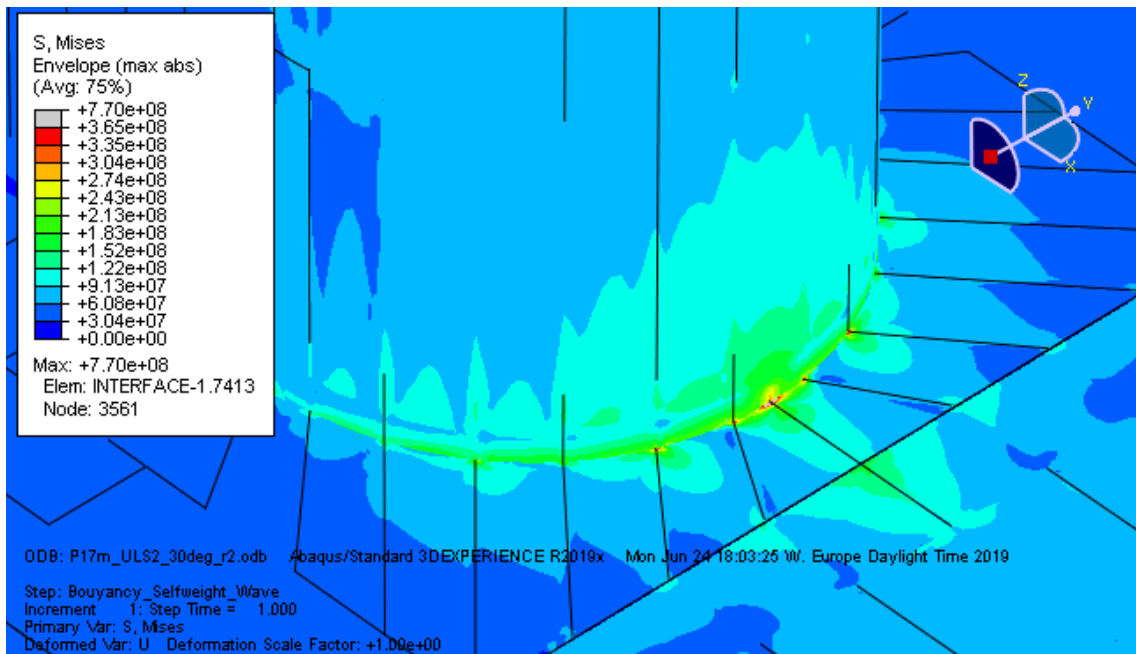
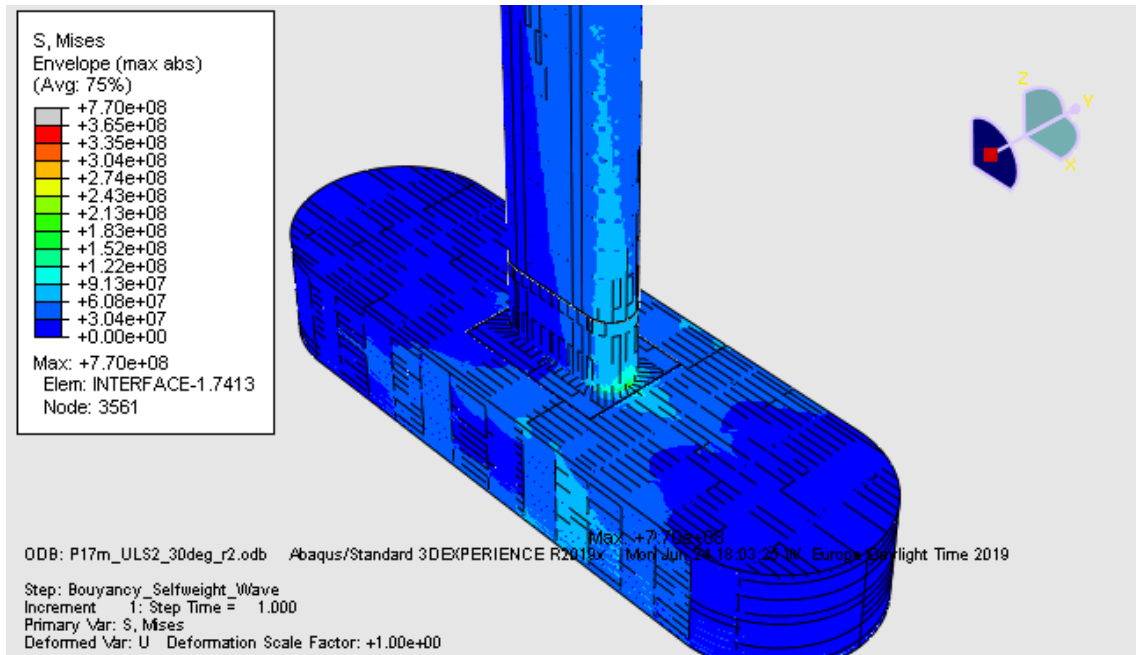


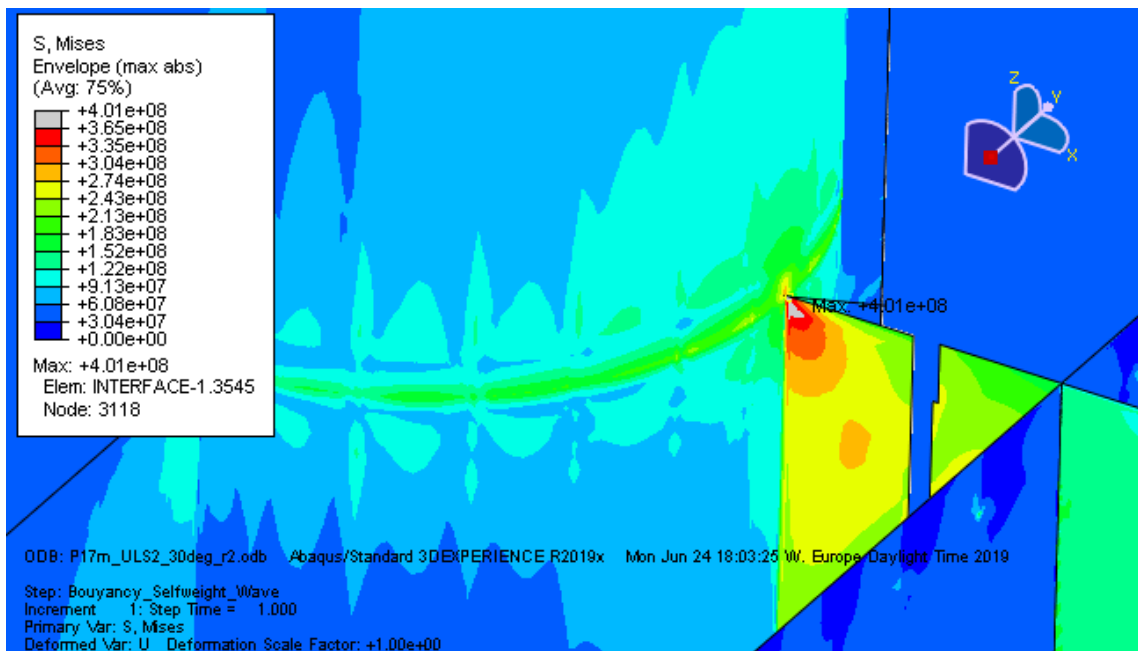
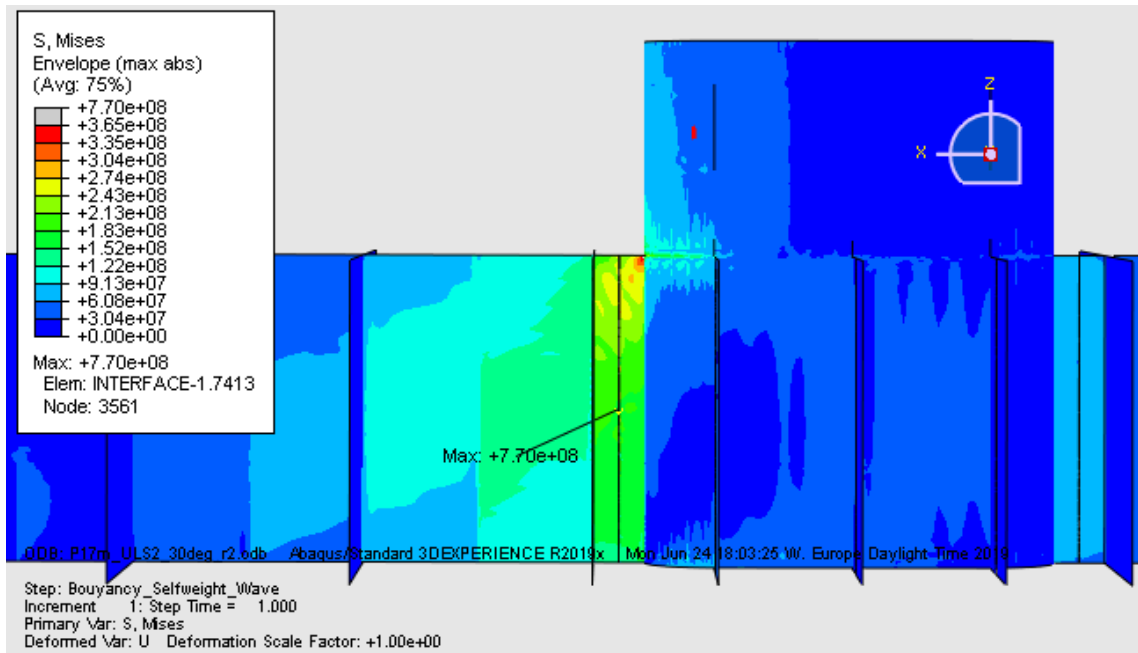
11 ULS 2 15DEG



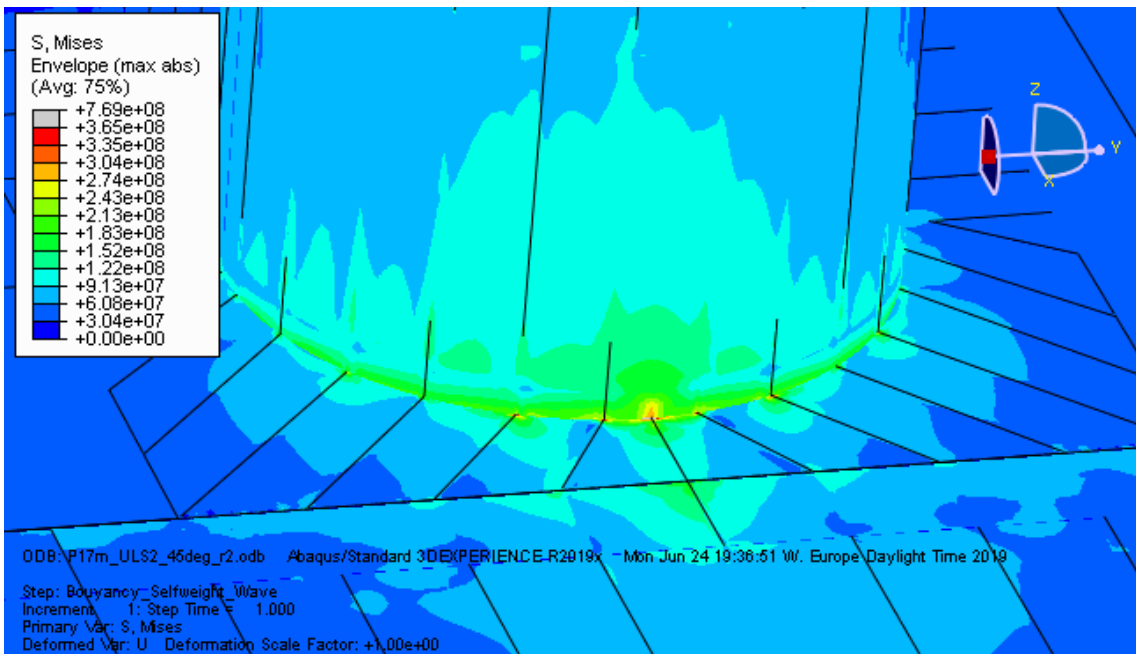
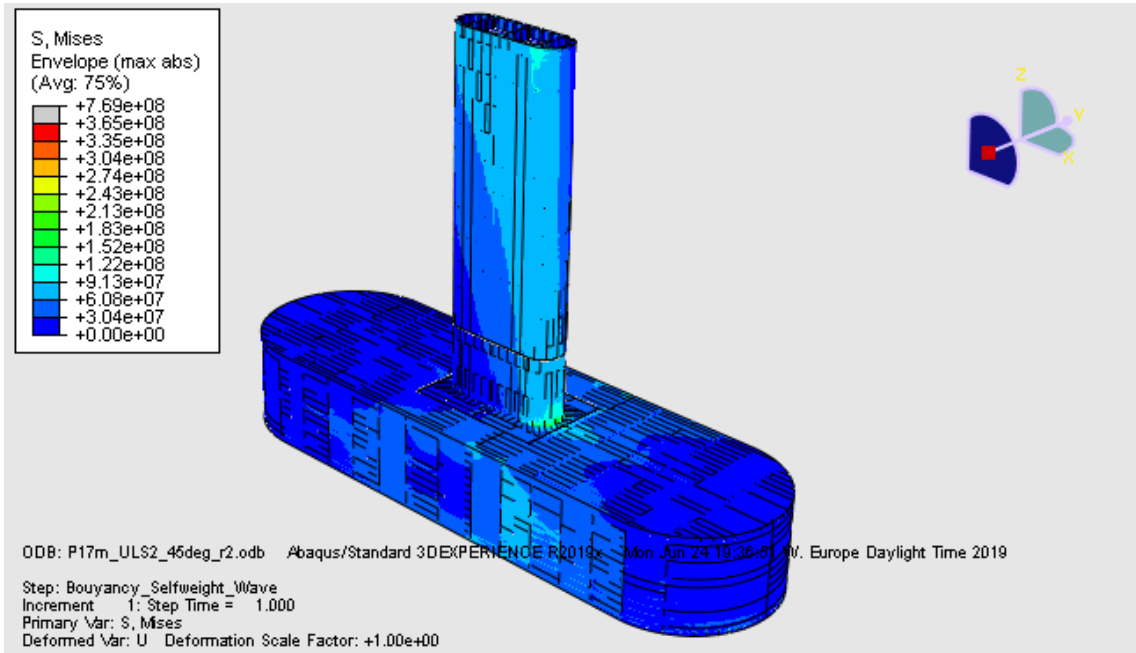


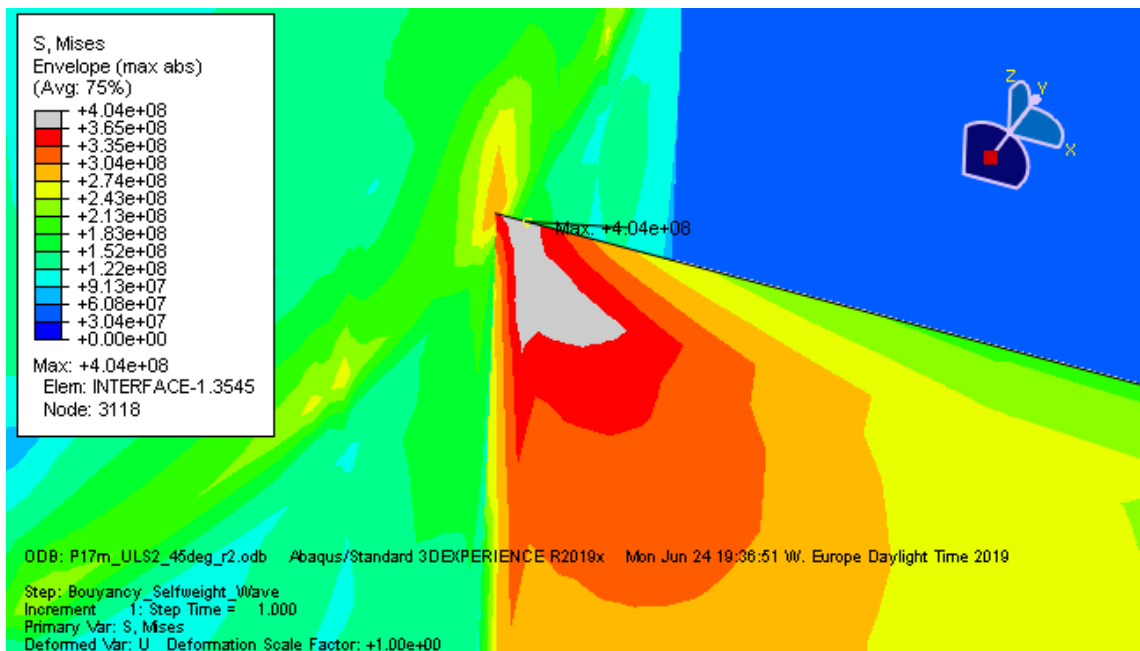
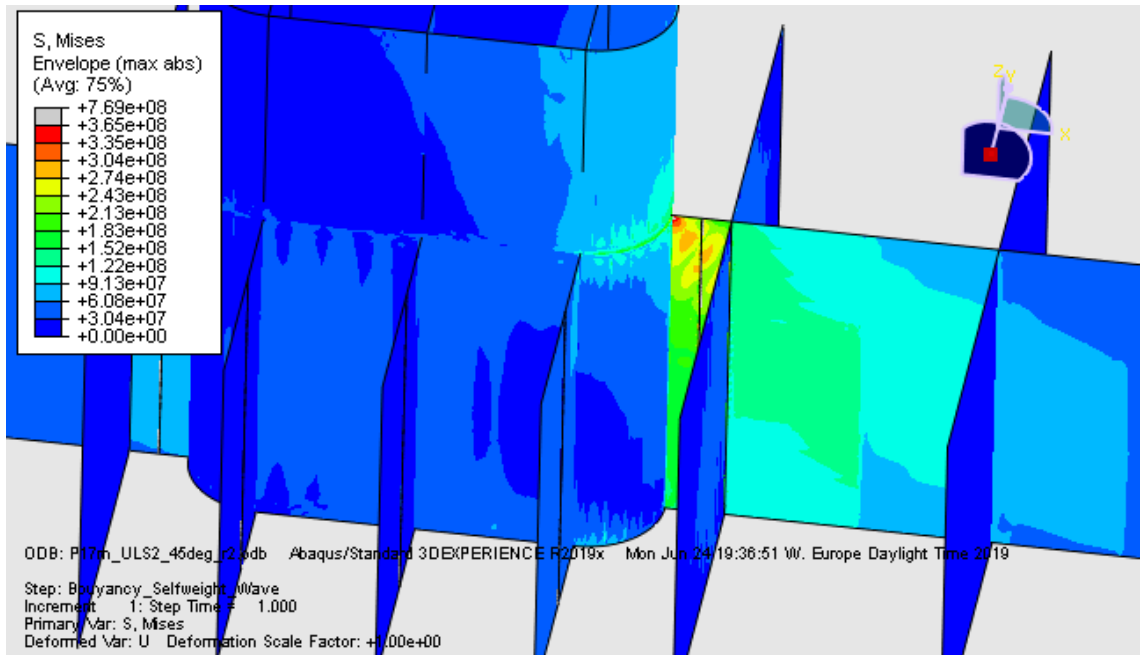
12 ULS 2 30DEG



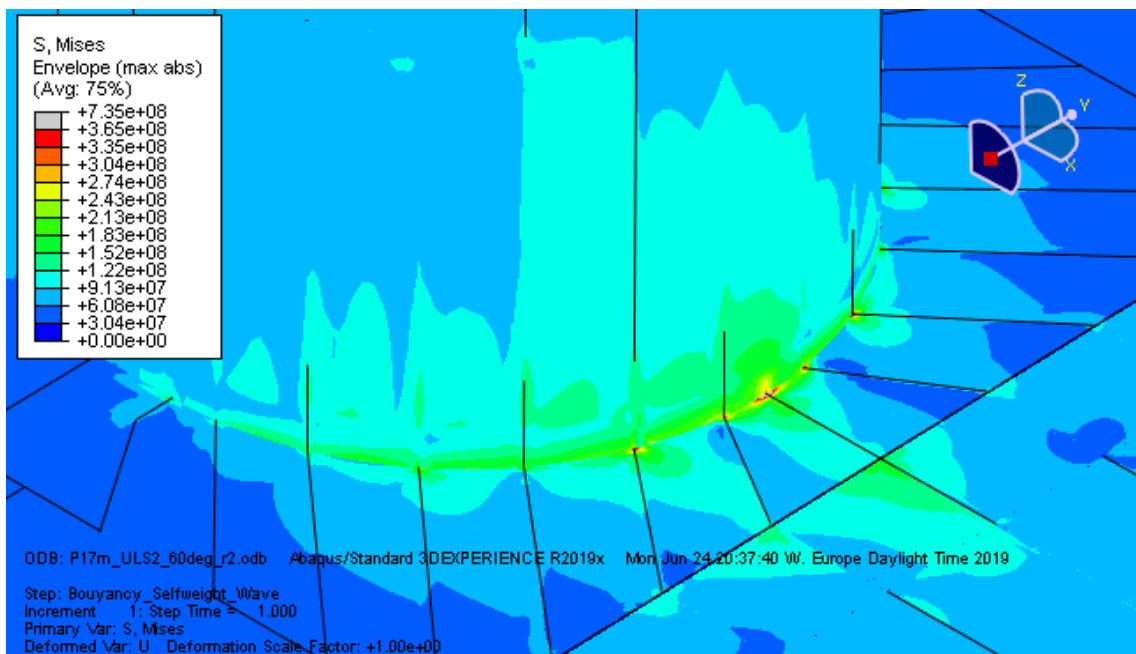
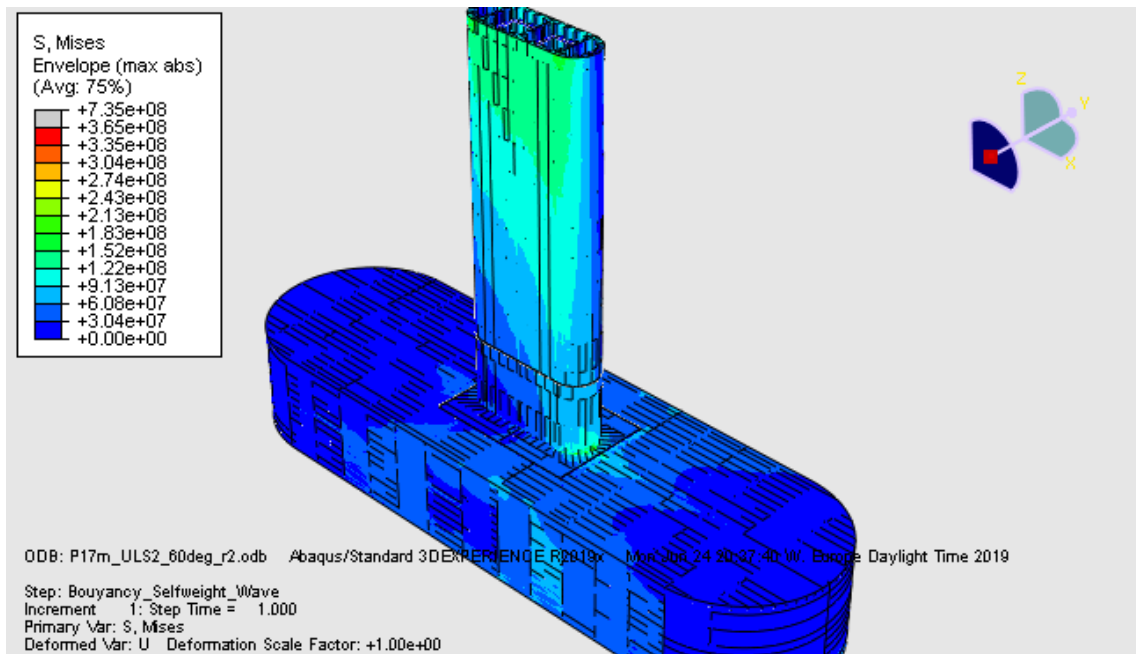


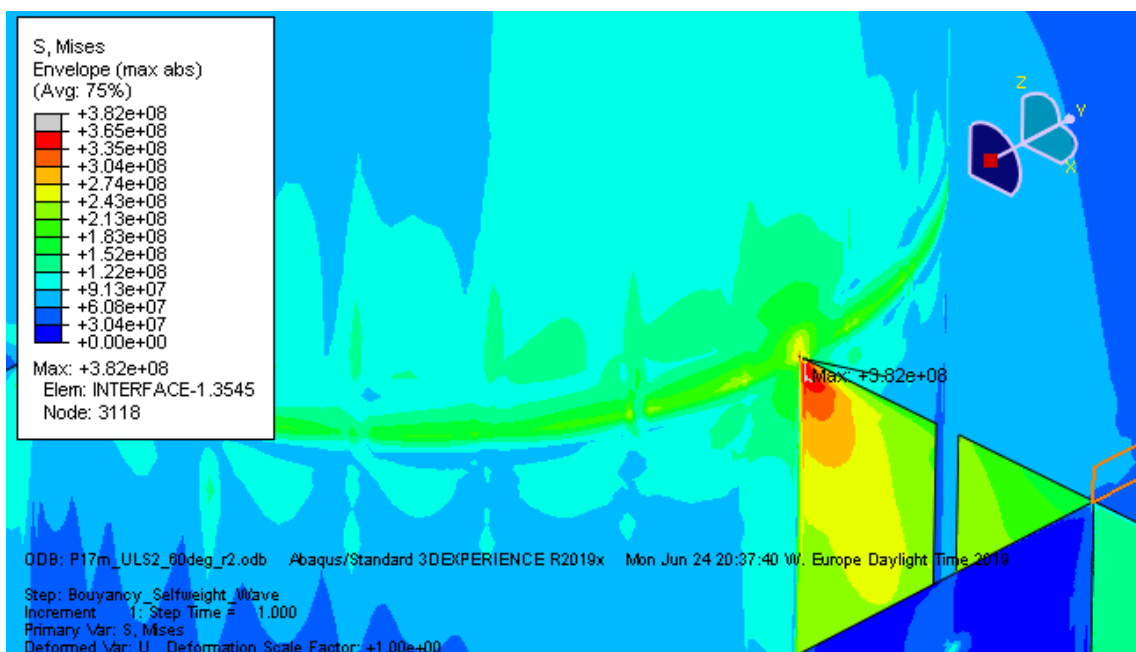
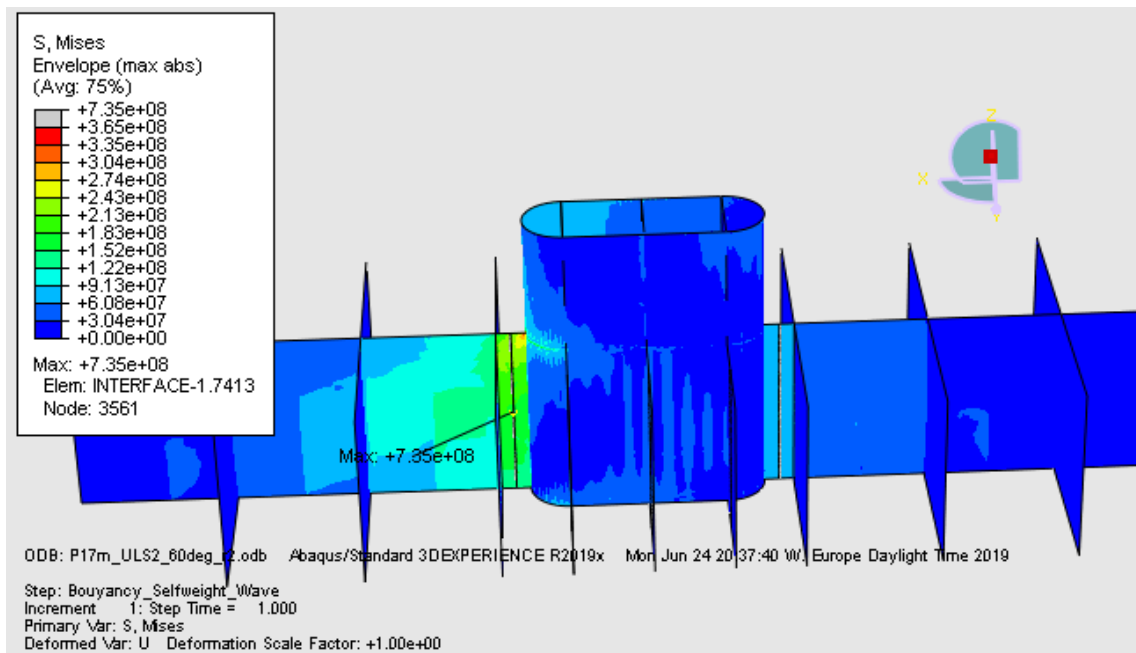
13 ULS 2 45DEG



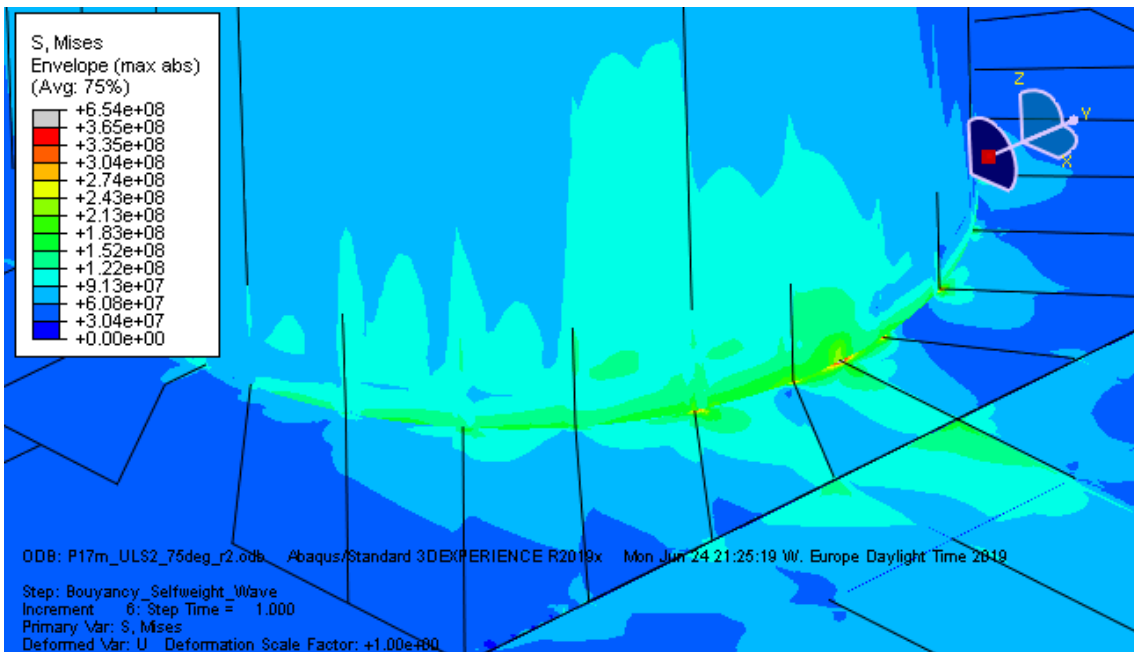
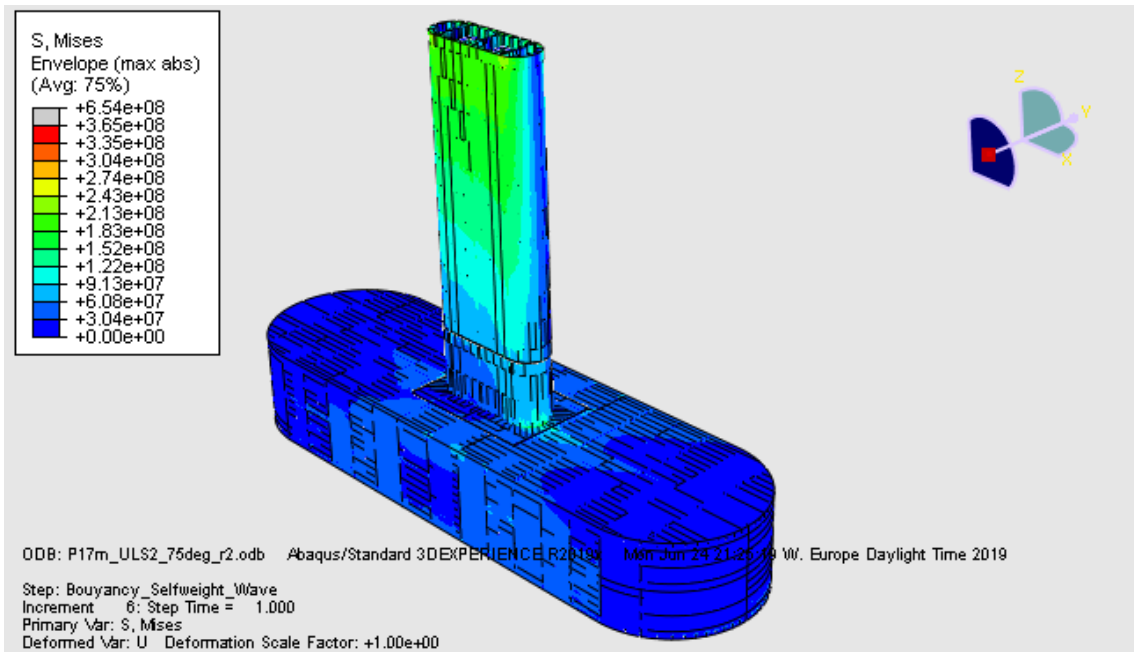


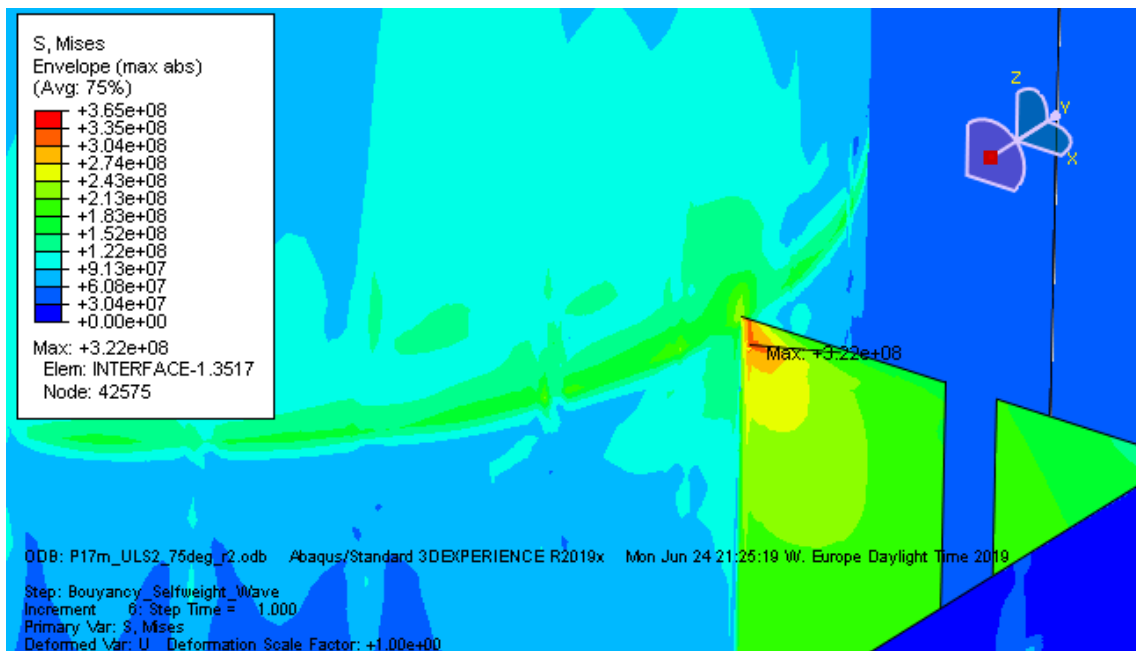
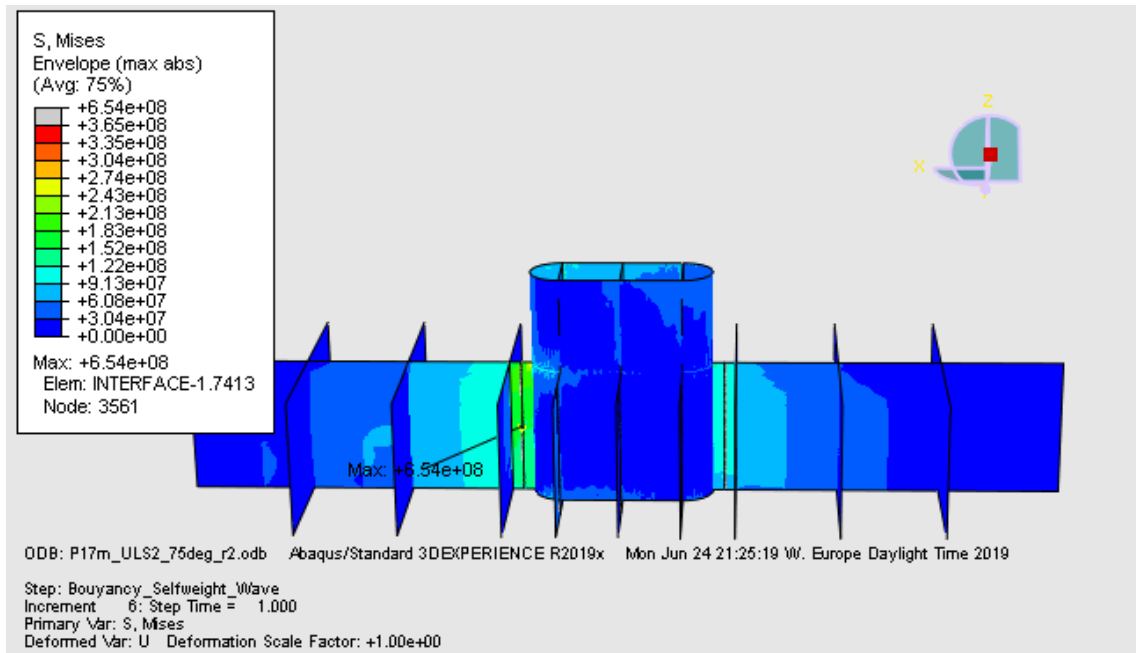
14 ULS 2 60DEG





15 ULS 2 75DEG





16 ULS 2 90DEG

