

# WLNG FST Engineering Completion

## WLNG FST Extreme Weather Analysis

### Struts, Conclusions and Way Forward

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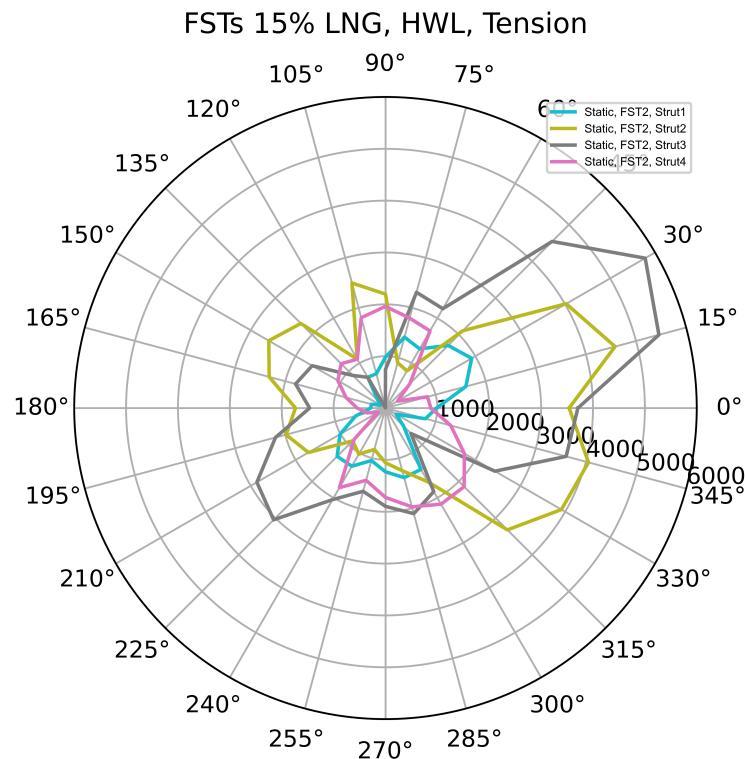
2025-01-31

## **Strut Loads, Static**

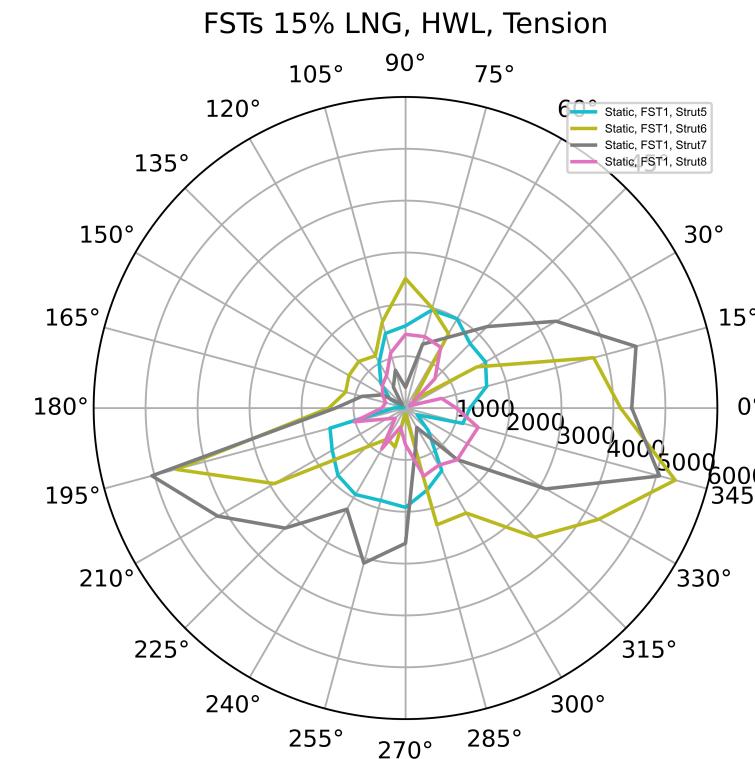
# Max Strut Loads, FSTs 95% LNG, 100yr, HWL, Tension, Static

- TBA

FST2



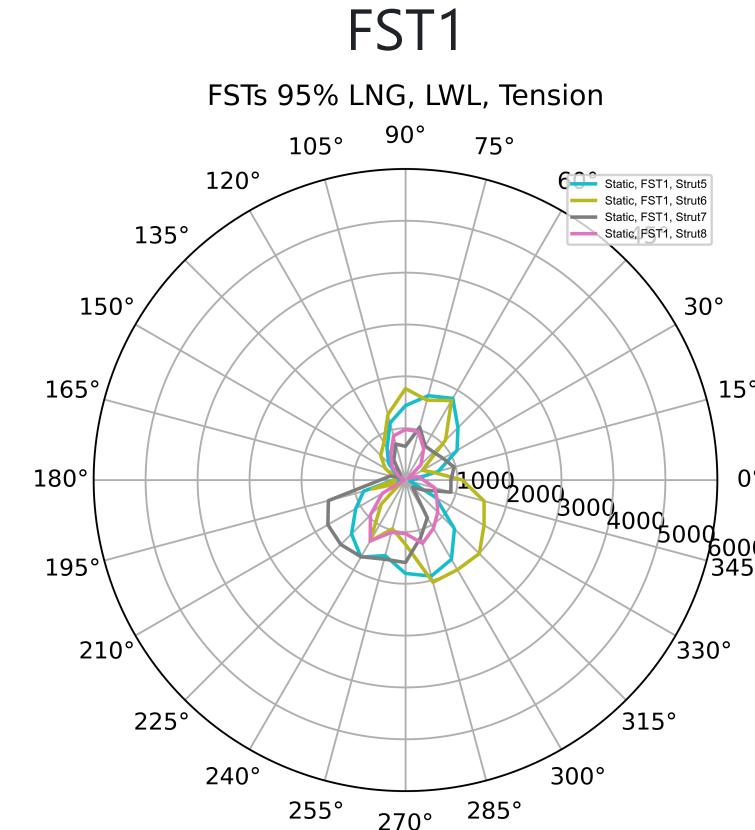
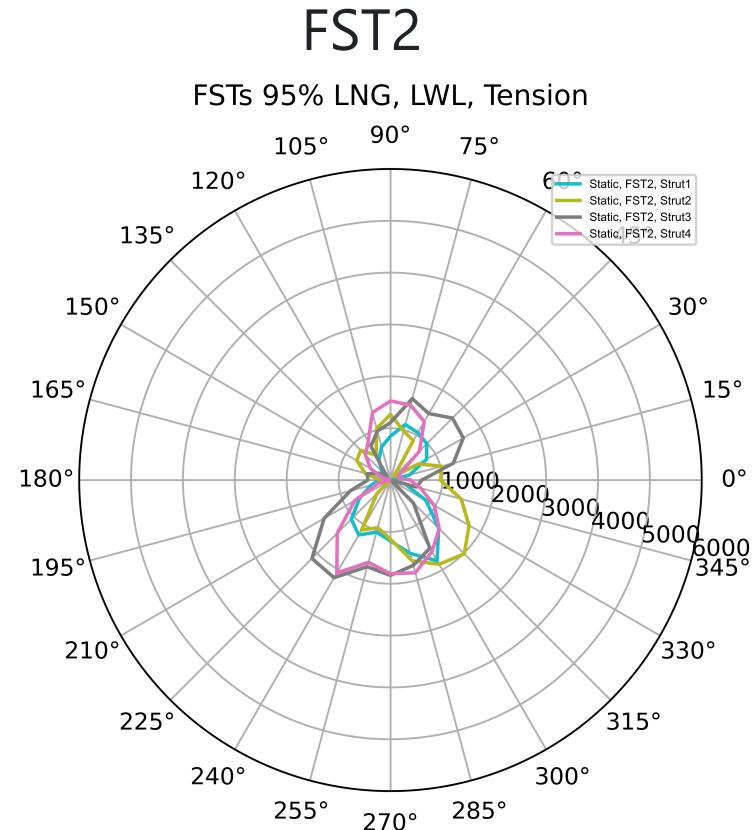
FST1



- TBA

# Max Strut Loads, FSTs 95% LNG, 100yr, LWL, Tension, Static

- TBA



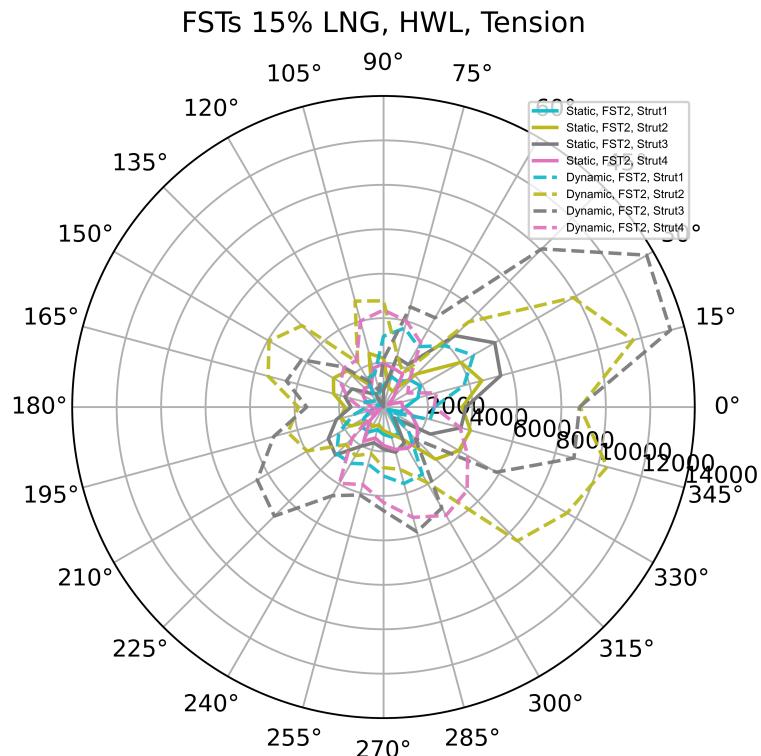
- TBA

## **Strut Loads, Dynamic**

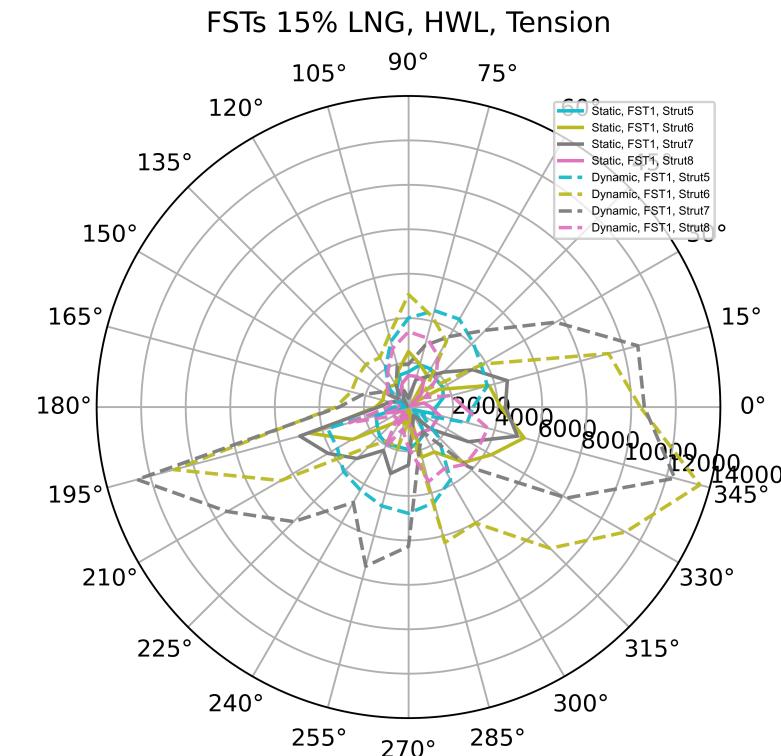
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- TBA

FST2



FST1

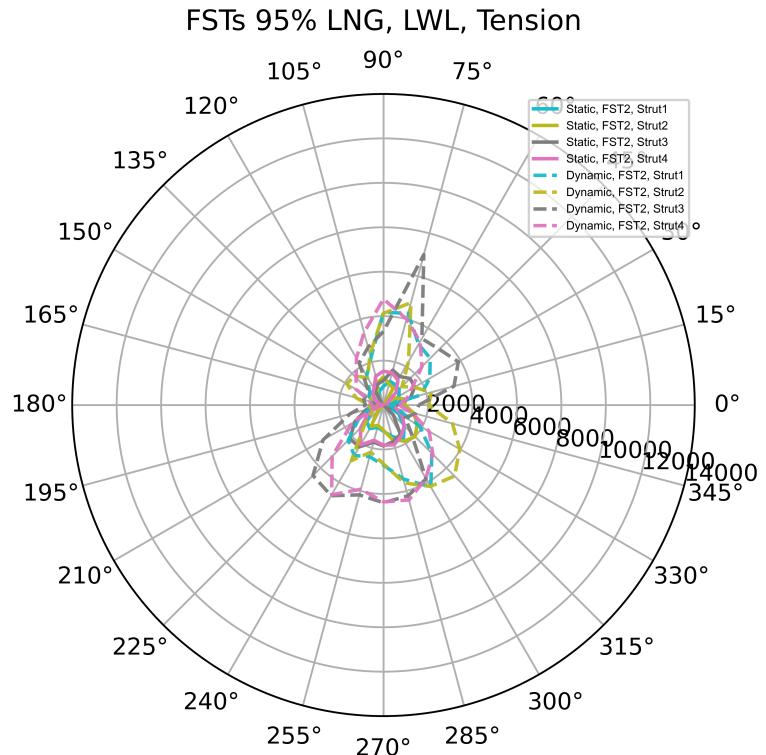


- TBA

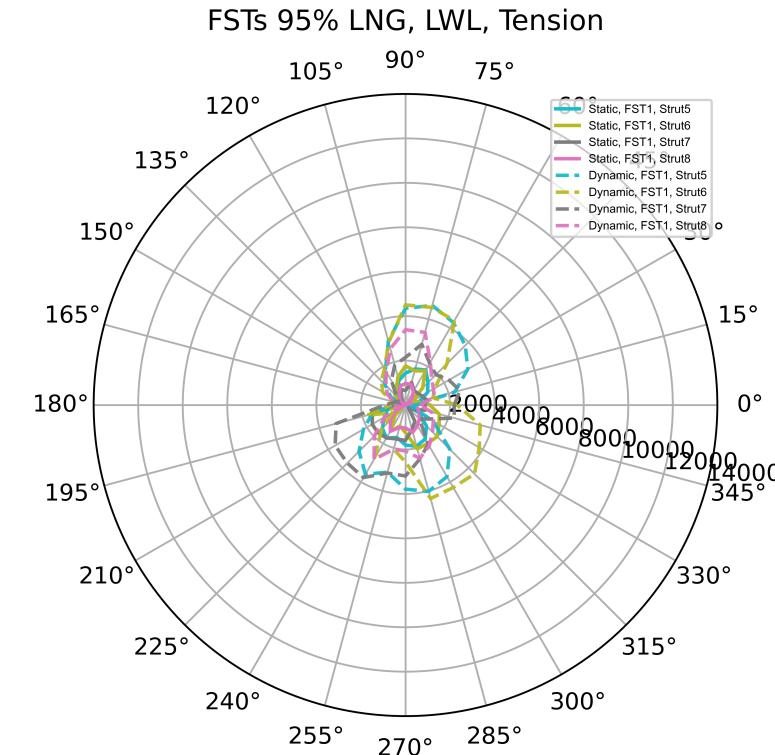
# Max Strut Loads, FSTs 95% LNG, 100yr, LWL, Tension, Dynamic

- TBA

FST2



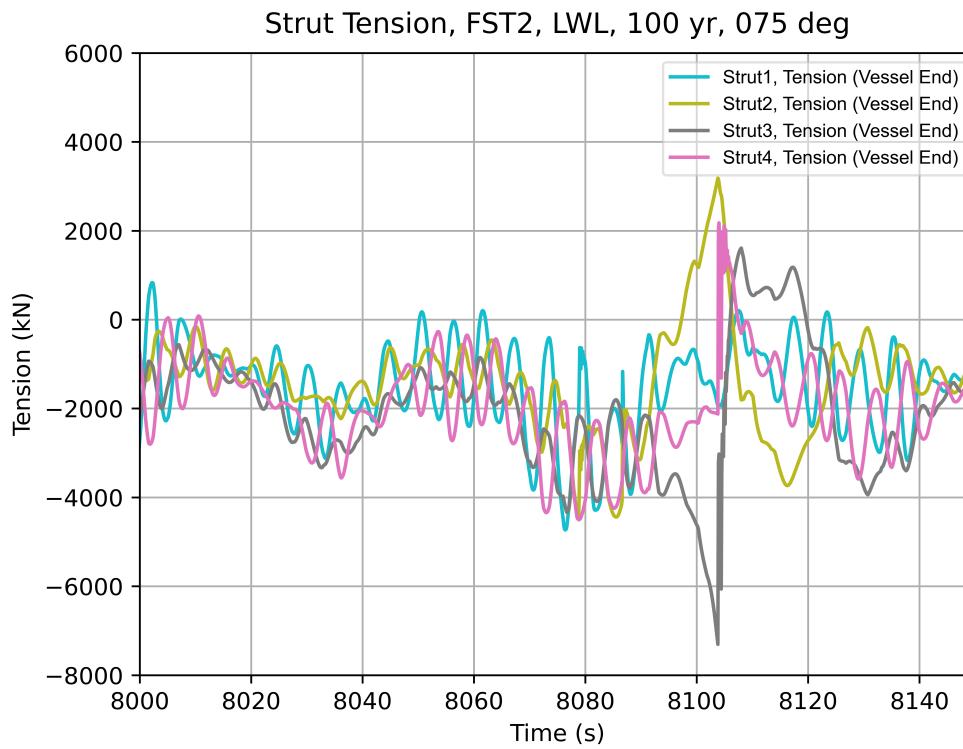
FST1



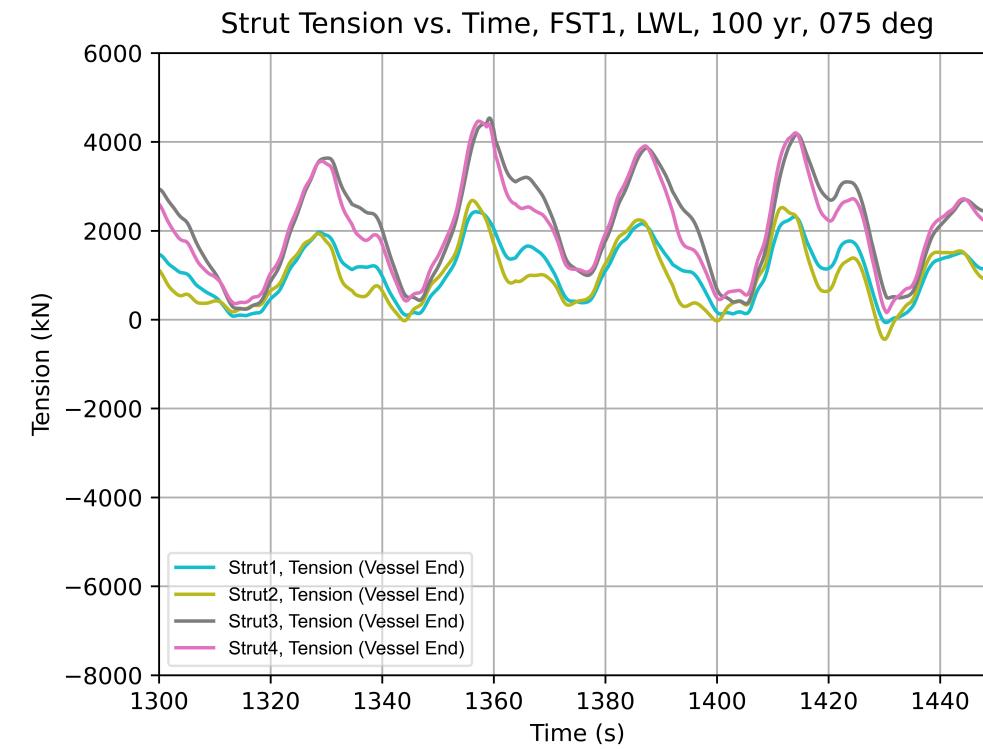
- TBA

# FSTs 95% LNG, 100yr, LWL - Force Timetrace

Min -ve



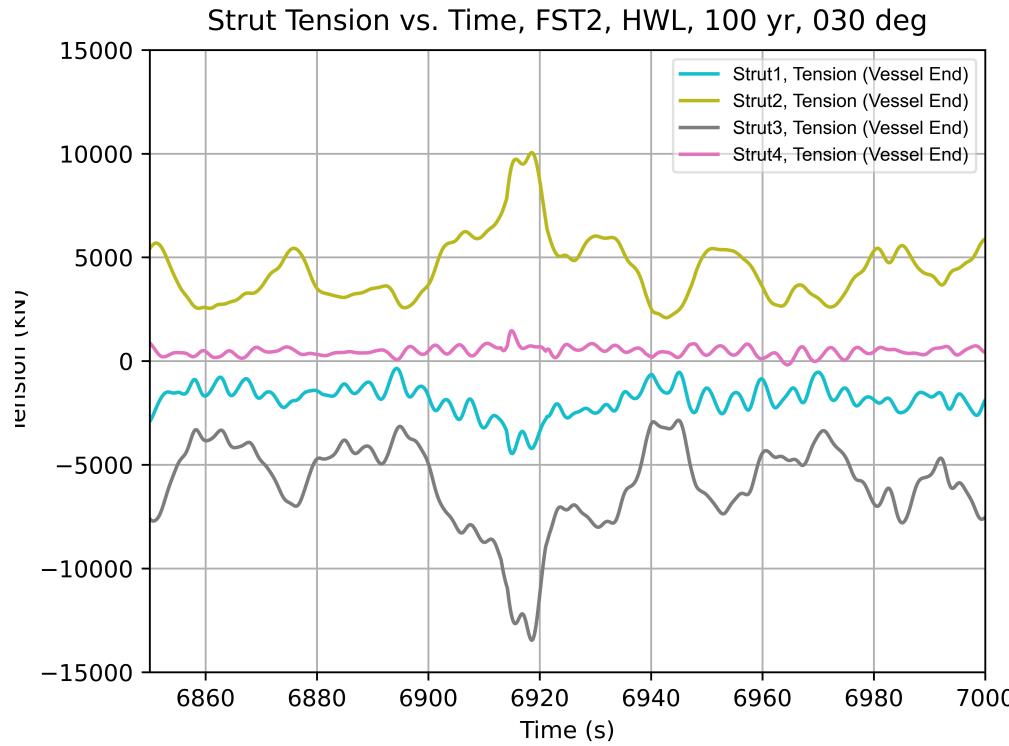
Max +ve



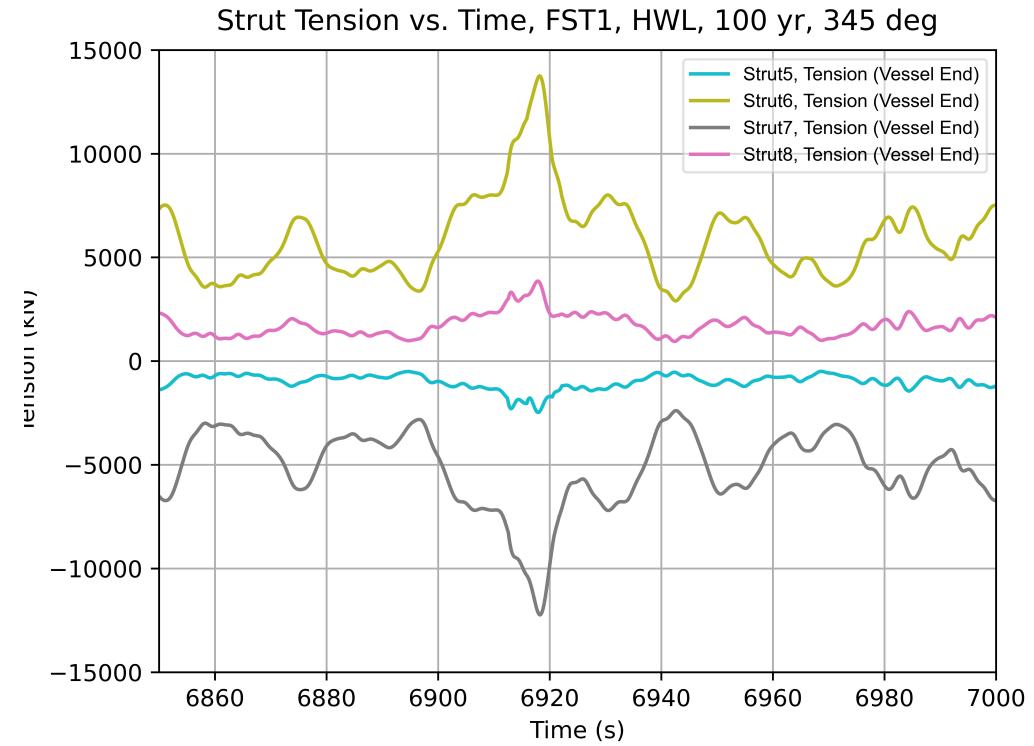
- The struts are in sync
- Results in lower strut forces when compared to HWL results

# FSTs 15% LNG, 100yr, HWL - Force Timetrace

Min -ve



Max +ve



- The 2 struts pairs are locked FST in tension-compression position
  - Results in high strut forces for FSTs 15% LNG, LWL condition
- This tension-compression lock position is similar to what was obtained in AQWA

## FSTs, 100yr Discussion

- 100yr, HWL has tension-compression lock position
  - potentially due to force coefficients used
  - Perform sensitivity analysis with wind force yaw-coefficients = 0
  - Perform timestep sensitivity with 0.05s and 0.025s. Current timestep is 0.1s.
- Determine whether tension-compression lock position is realistic due to prevailing external static loads (e.g. wind, current, wave etc.)

# Conclusions

## Way Forward

- FST tension-compression lock position
  - Theoretically, this effect may be possible.
  - Recommend permanent moring system designer, WSP to verify that this phenomenon does not occur from their design.
  - FST strut interface foundation is currently designed for all loads presented in this document.

# Way Forward

- 100 yr FSTs only QA/QC (Ongoing)
- 5 yr FSTs with LNGC
  - Will get this running after few more insights in 100 yr analysis