

# Structural modelling of FPSO modules to avoid vibration problems

SRJ CASE STUDY, 2021



## PROBLEM

Space is always a premium on FPSOs, so creating more compact modules can provide significant advantages.

A FPSO designer was looking to create generic modules that housed different types of machinery. A concern was raised as to the impact that machinery induced vibration may have during operations.

SRJ was engaged to perform a detailed structural modelling of the proposed module design, to help mitigate the risk posed by machinery induced vibration.

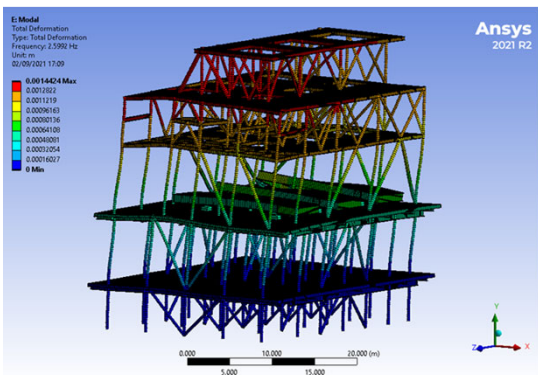
## SRJ SOLUTION

The vibration studies included a machinery review to identify excitations and sensitivities to vibration. This was followed by a structural finite element assessment of the module, to assess transmission paths between machinery and predict likely vibration levels due to the identified excitation forces.

Where excessive vibration was predicted remedial solutions were assessed, these included:

- Changes to machinery mounting, use of anti-vibration mounts instead of gimbal mounts or hard fixing to the deck
- Localised stiffening of the structure
- Increased separation between machines

The vibration study also provided design recommendations for other potential vibration sources, such as from piping and valves.



## DELIVERED VALUE



### REDUCED OPERATIONAL COSTS

By including vibration studies in the design the risk is reduced of having to implement costly mitigations during operations.



### INCREASED RELIABILITY

Multiple machinery types within the same module can now be run reliably.



### IMPROVED INTEGRITY

The structural integrity of the modules will be preserved for longer thus reducing risk and reducing overall lifecycle cost.

SRJ provides specialised consultancy services.  
Contact us for more information.

david.capeling@srj-technologies.com  
bill.skales@srj-technologies.com

SRJ Technologies Group plc  
www.srj-technologies.com

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