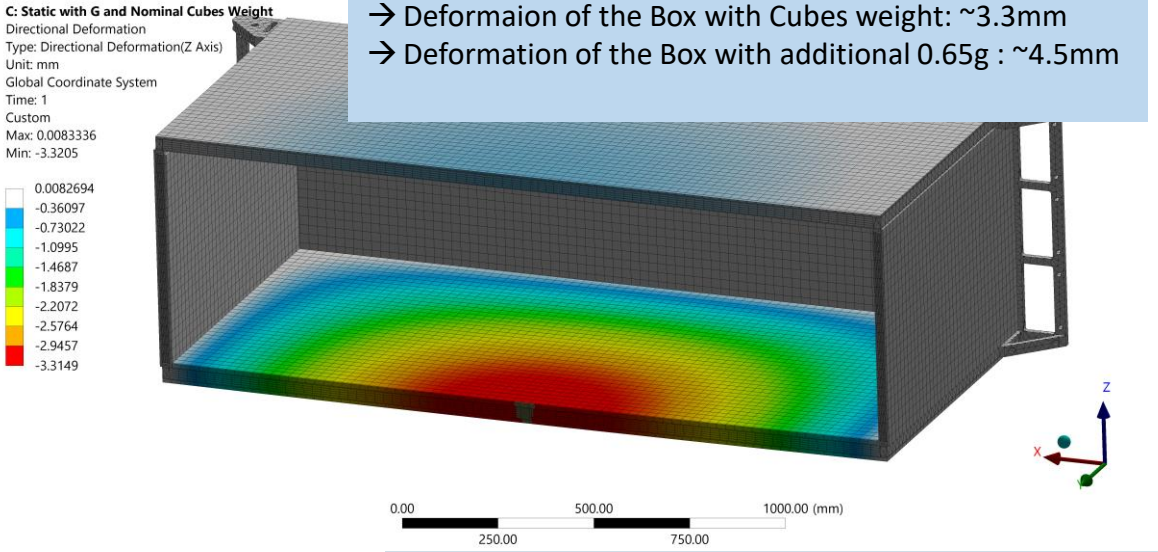
BOX FEA RESULTS

- Deformations at the Box caused by using crane are negligible.
- Vibrations induced from the crane are for sure not worse than vibrations caused by an earthquake



→ Deformaion of the Box with Cubes weight: ~3.3mm
→ Deformation of the Box with additional 0.65g : ~4.5mm

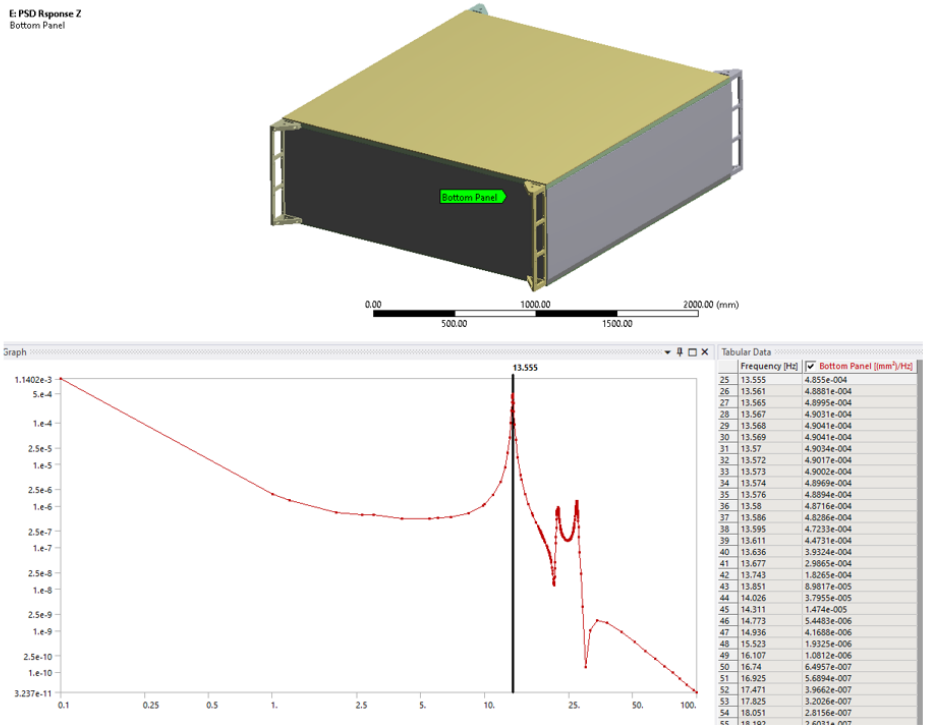


Figure 6-59 Scenario 1 – Vibration in Z direction – Results at the Bottom Panel

A peak is found at 13,555 [Hz] with a PSD of 4.855e^{-4} [(mm^2)/Hz]

Indicatively vibrational amplitude derived of the Bottom Panel → A=0.081 mm

Max Crane Acceleration considered for Lifting Device Design:

Additional 0.1g in every direction

BS EN 13155:2020

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13155

December 2020

ICS 53.020.30

Supersedes EN 13155:2003+A2:2009

English Version

Crane - Safety - Non-fixed load lifting attachments

Appareils de levage à charge suspendue - Sécurité - Accessoires de levage amovibles

Krane - Sicherheit - Lose Lastaufnahmemittel

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→ Semi-Static FEA were done assuming 0.65g in every direction

BOX FEA RESU

- Deformations at th
  are negligible.
- Vibrations induced
  not worse than vib
  earthquake

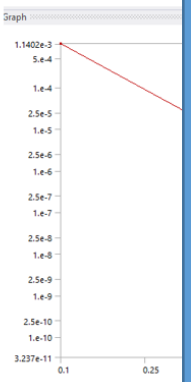
Estimated Amplitude

Conclusions:

- From the mechanical point of view the box is safely stable
- Influence of an Earthquake at the Box shows that the semi-static FEA with 1.65g is conservative → Real deformation of the Bottom Panel will be less than the ~4.5mm results from FEA.
- Once the SFGD Box is closed (with foam) cubes will not be able to move easily inside the Box (this is a consideration and not a statement). Especially becasue Crane acceleration is very low.
- As stated in the FEA report is practically impossible to simulate the behaviour of the 2 Milions cubes inside the box.

Risks by considering multiple manipulations:

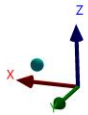
- Possibility to have an earthquake during operation
- Human Error → shock against obstacle
  → bad fixing or mistakes at the Lifting device



Figur

A peak is found at 13,5

Indicatively vibrational amplitude derived of the Bottom Panel → A=0.081 mm



Device Design:

BS EN 13155:2020

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load lifting attachments

Krane - Sicherheit - Lose Lastaufnahmemittel

suming

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