

Abstract

Modelling of Large Rectangular Beam Structures with Adjacent Small Fluid Gaps, When Under A Dynamic Transient Load

Small fluid gaps in large beam structures can significantly affect the loads generated in the structure when substantial dynamic loads are applied to it.

This presentation looks in detail at how modelling, small fluid gaps in large beam structures can drastically change the loads generated by

- a) changing gap sizes.
- b) modelling dry or wet conditions and
- c) modelling single or multiple adjacent beams.

The initial investigation focuses on a long rectangular section component, which is constrained fully at the top and bottom. Approximately mid-way a contact area is modelled to create a small gap between this area and the component. An initial dynamic analysis is carried out using dry conditions. Sensitivity is carried out by changing the gap size. Further analyses are carried out by modelling the wet conditions using appropriate ls-dyna elements.

Once a good understanding of the single long rectangular beam section is gained, complexity is added by introducing 2 more identical beams adjacent to the original. Now there is no contact area at the mid-way of the components, the only contacts the 3 rectangular beams have are between themselves. Investigations are then carried out to see how the 3 beams behave for given geometry, gap size and wet/dry conditions. Do they move independently or do they behave as a single entity?

Thanks,

Kind Regards,

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