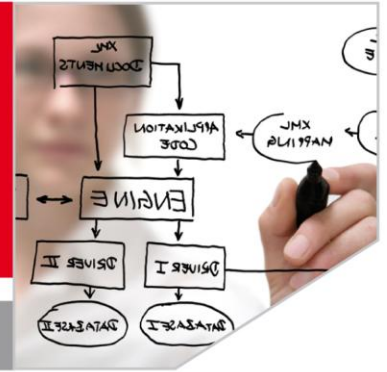


Improvements to Train Positioning Velocity Profiles

John Bills, Mechanical Engineer, Curtin University

Mechanical Branch Engineers Australia WA, the Institution of Mechanical Engineers, the American Society of Mechanical Engineers and Australian Society for Bulk Solids Handling



EVENT DETAILS

Date:

Thursday, 4 October 2012

Time:

5.30 pm for a 6.00 pm start

Venue:

Auditorium
Engineers Australia
712 Murray Street
West Perth

Cost:

Free

RSVP:

Not required

Iron ore deposits in Western Australia are located large distances from suitable export facilities. Extensive rail networks are used to transport the iron ore to seaports along the coast for shipment. Trains used for these purposes can be over two kilometres long weighing over 24,000 tonnes. On arrival at the seaport the open-top wagons are unloaded by a car dumper. During this unloading process two wagons at a time are sequentially indexed along the track into the car dumper and inverted to empty the ore.

This presentation shows how the in-train forces experienced during car dumping can be reduced by altering the velocity-time profile of the positioner. During wagon indexation large coupler loads are experienced along the train. These large cyclic loads can cause: high fatigue rates on wagon connection components, in-service coupler failures resulting in split trains, high wagon maintenance and production delays. Analogue and numerical models created to simulate train unloading dynamics are shown in this presentation. These models allowed testing of various positioner velocity-time profiles for their effect on in-train coupler forces. Findings show a surprisingly strong relationship between positioner velocity and peak coupler forces leading to practical findings for the operation of car dumpers and rolling stock.



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ABOUT THE SPEAKER

John Bills graduated from Curtin University last year with a Bachelor of Mechanical Engineering (Honours). His final year thesis on train positioning received much industry attention and won awards including Railway Engineering Student Thesis Award by RTSA. John now works in the Oil & Gas industry for General Electric in their Project Management team for new turbomachinery installations.