# STAR-CCM+ an Invaluable Tool for Coal Fired Power Plant Design Optimisation

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Aerotherm was contracted to evaluate the dynamic behaviour of a large nozzle check valve integrated into a feeder tank system forming part of a pipeline project in Southern Africa.

The scenario investigated considered the dynamic response (opening) of the nozzle check valve should the head in the main pipeline suddenly be lost. Several techniques were explored to implement the dynamic plunger motion into the simulation. STAR-CCM+ enabled Aerotherm to in a very short time frame develop a practical methodology to model the dynamic plunger motion. This technique utilised user coded JAVA macros to control the plunger motion and physics. The flow induced forces are calculated within STAR-CCM+, passed to the used sub-routine which calculates the plunger dynamics and passes back the plunger displacement/velocity. STAR-CCM+?s extremely powerful meshing capabilities and efficient memory management enabled the valve to be modelled in a very high level of detail.

Aerotherm?s model answered all the questions surrounding the implementation of the valve into the feeder tank system and provided priceless insight into the dynamic system response to such events.

**Author Company:**
Aerotherm Computational Dynamics
**Author Name:**
Ignus le Roux, Warwick Ham
**Industries:**
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Oil and Gas[3]
**Products:**
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**Conference:**
STAR Global Conference 2014[5]





**Links:**

[1] http://www.cd-adapco.com/sites/default/files/Presentation/SGC2014_AerothermSteinmuller_leRouxHam.pdf
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