

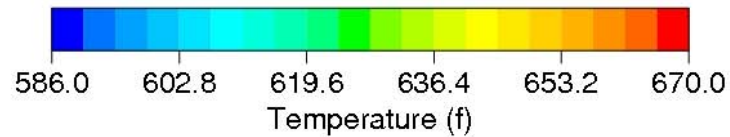
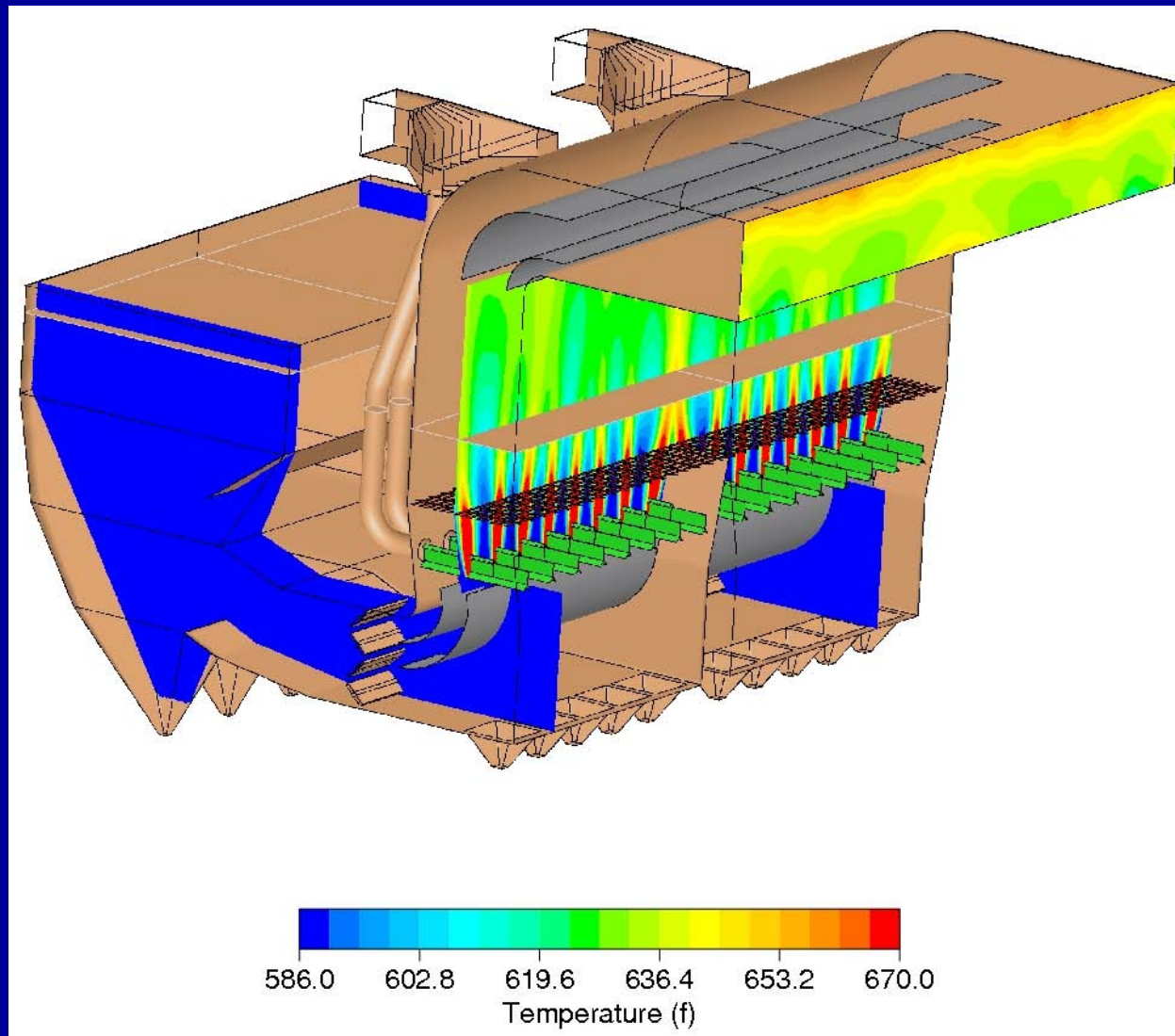
Reinhold Environmental Ltd.



2008 NOx-Combustion Round
Table & Expo Presentation

February 4-5, 2008 in Richmond, VA

Case Study – IPL Harding Street Unit 7



Case Study – IPL Harding Street Unit 7

❖ Low Load

- CFD model: ΔT at catalyst ± 20 °F
- Physical model: ΔT at catalyst ± 29 °F

❖ Mid Load

- CFD model: ΔT at catalyst ± 22 °F
- Physical model: ΔT at catalyst ± 9 °F

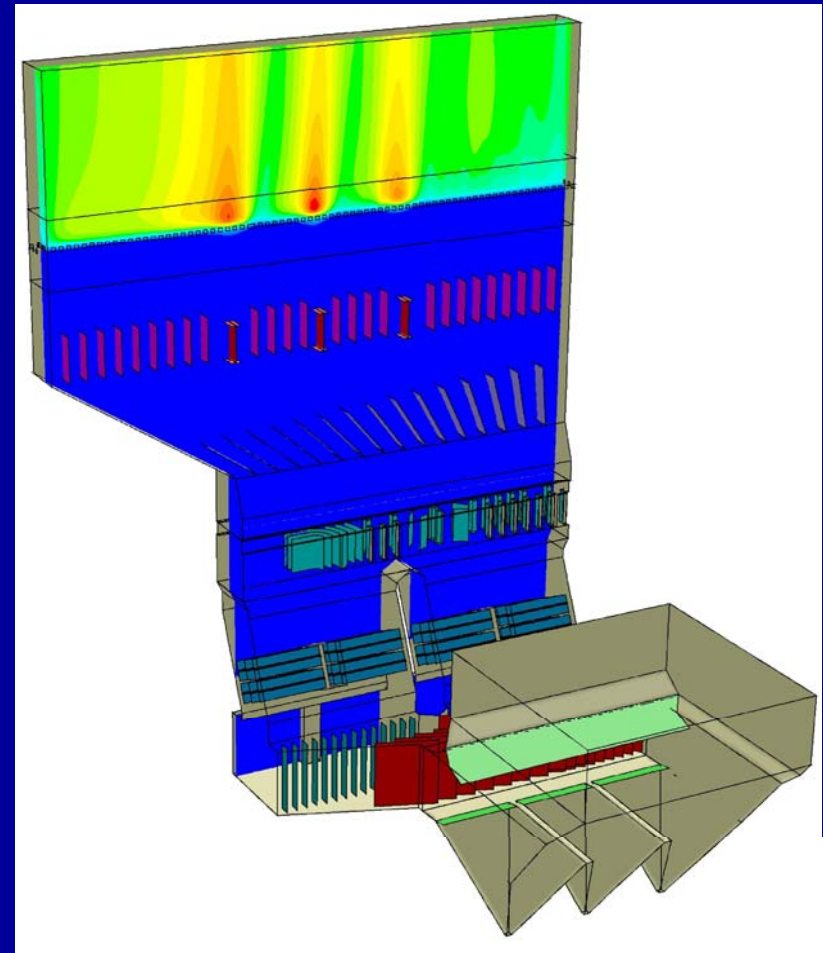
❖ Operating experience since start up May 2005

- No problems achieving low load turndown
- NO_x reduction guarantees met



SCR Ammonia Injection

- ❖ Tracer gas in physical model
- ❖ Species tracking in CFD



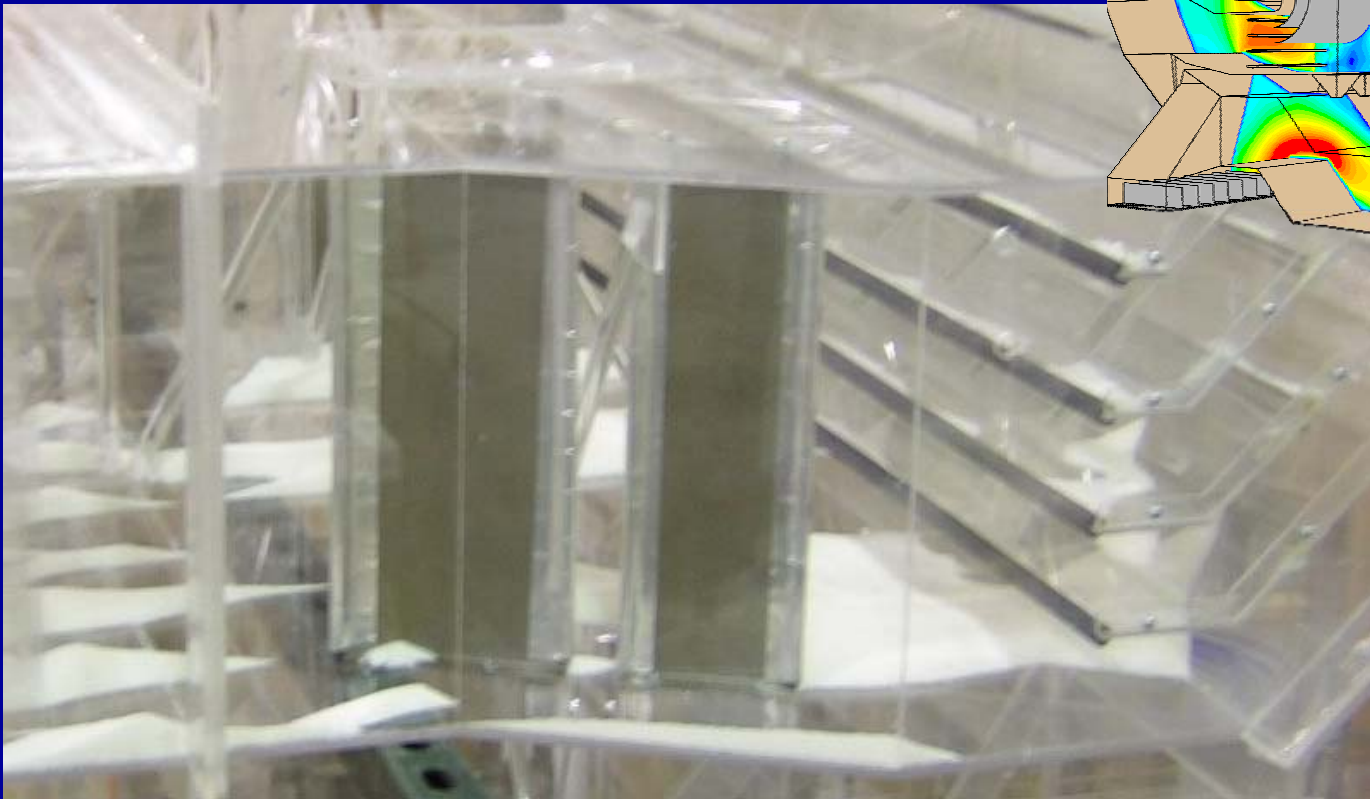
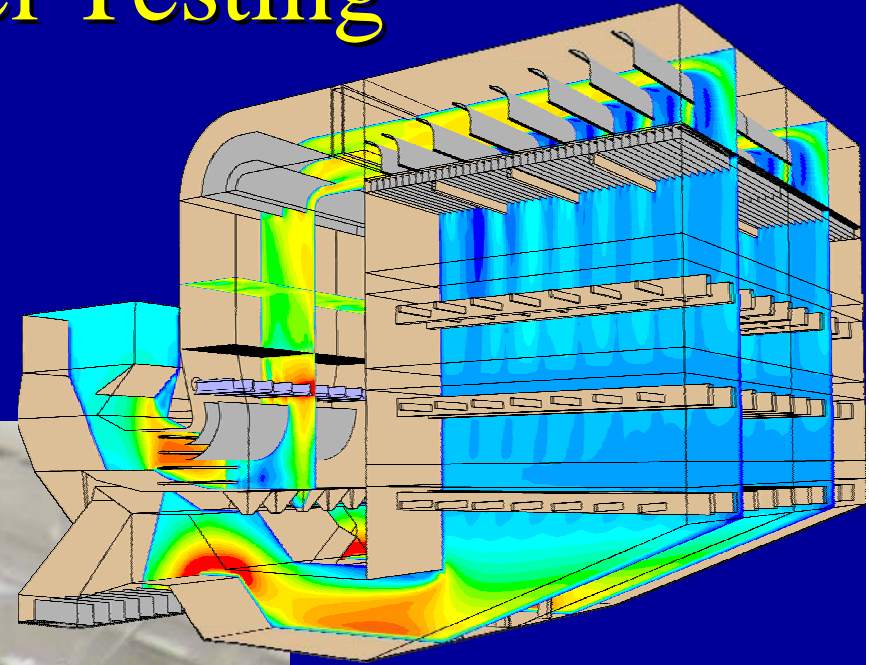
Ash Deposition

- ❖ Duct floors
- ❖ Turning vanes
- ❖ Catalyst



Ash Deposition – Model Testing

- ❖ Drop out
- ❖ Re-entrainment



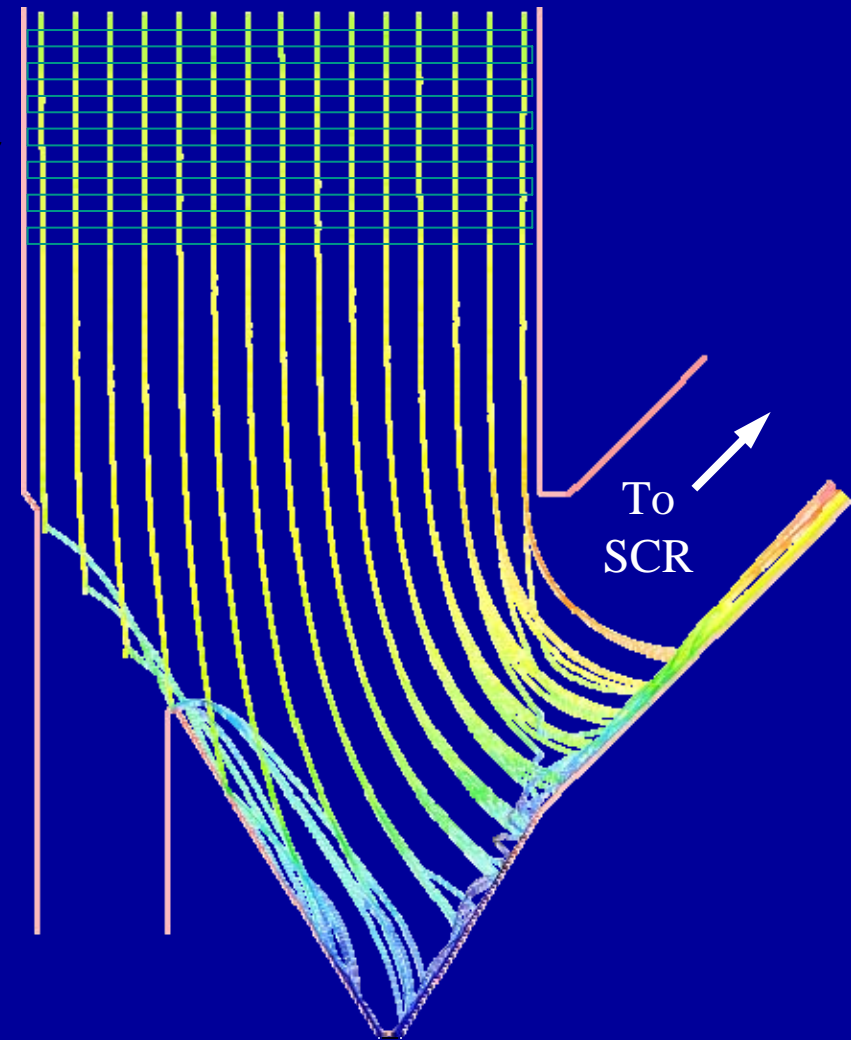
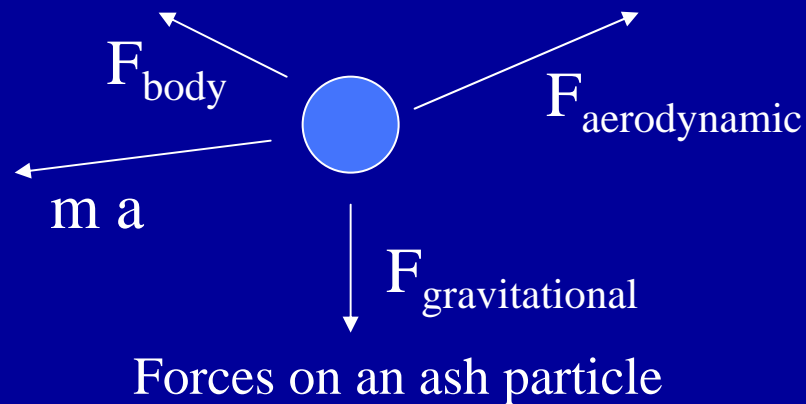
SCR Large Particle Ash Capture

- ❖ Catalyst openings for coal-fired plants are smaller than LPA particles
- ❖ Once LPA becomes “wedged” into a cell, fine ash builds up as well
 - Hard to clean
 - Get dunes of ash on top layer catalyst



LPA Modeling

- ❖ Track ash particles through the ductwork and hopper regions
- ❖ Calculate hopper capture efficiency for various particle sizes
- ❖ Use model to evaluate wide range of design options



Baseline Geometry
5 mm particle streamlines -
60% capture