

Dust expert says Olds Elevator, DSH can help avoid explosions



"I see the Olds Elevator replacing lots of bucket elevators," commented Associate Professor Peter Wypych, Centre for Bulk Solids and Particulate Technologies, University of Wollongong.

One of the foremost Australian experts on dust control, Professor Peter Wypych of the University of Wollongong, was enthusiastic in his endorsement of the Olds Elevator and Dust Suppression Hopper (DSH) at the recent Dust Explosions 2007 conference.



The Dust Suppression Hopper in action.



Installation of an Olds Elevator.

In the lead-up to Wypych's session, conference delegates, mainly comprising senior executives from the grains, food and agriculture sectors, had heard repeatedly of the dangers in bulk handling plants of secondary explosions arising from migrant dust accumulated over a long period of time.

A frequently referenced example was the devastating explosion at the Bestcare pet food factory in Gunnedah in January 2003 which leveled the factory and a good many buildings in a one kilometre radius. There, a propane leak occasioned a small primary explosion, with years of built-up dust contributing to the secondary, and far larger, dust explosion.

One speaker, Tony Vierboom, director, Nova Protection Systems, explained that a small layer of dust (of just 0.4mm of dust on each square metre of floor space) can be enough to produce a "very large and devastating explosion".

In his session on "latest developments in handling technology to increase plant safety" Professor Wypych discussed two new systems — both backed by small companies — which promise major reductions in fugitive dust emissions.

The Olds Elevator was developed by Australian engineer Peter Olds when he needed to elevate sand for metal casting five metres above his foundry floor. In a flash of inspiration, Olds reversed the normal screw conveyor to create a device — the Olds Elevator — in which the outer casing rotates around a static inner screw.

The Olds Elevator minimizes particle damage and dust and hence, according to Professor Wypych has "much less chance of explosion propagation."

According to Robert Olds, a director of the family firm backing

the Olds Elevator, the product is being distributed internationally via a "family" of distributors.

Professor Wypych commented that: "We're quite intrigued by this product at (the University of) Wollongong and we are going to apply some science, so we are building a test rig." He added, "I see the Olds Elevator replacing lots of bucket elevators."

The Dust Suppression Hopper was developed by DSH Systems' Trevor Schwass when he was asked by a fertiliser company for a solution to a plant plagued by dust. The facility was suffering to such an extent that men and machinery disappeared into the murk.

In response, and after several years of design, tinkering and fine-tuning, Trevor developed the Dust Suppression Hopper which continuously discharges product through free air as a solid column.

The system consists of a hopper with a central plug and uses mechanical means to control the clearance between the hopper and the plug. Material is conveyed into the top of the hopper and is contained until the weight forces the hopper to move away from the plug, releasing the material through the cavity between the plug and the hopper at the bottom of the device. The "head" of material maintained in the hopper squeezes the trapped air and allows it to disperse; the product then flows in parallel entry and exit.

Following Professor Wypych's presentation, and practical demonstration of a perspex section of an Olds Elevator, questions came thick and fast from the conference audience.

In the battle to reduce the incidence of dust explosions, the Olds Elevator and Dust Suppression Hopper will be two very useful tools in the armoury of bulk handling engineers and technicians. ■