

Schematic of the installation at National Power. Powder is fed from FIBCs and drums into a loss-in-weight feed-sieving system which then leads to material conditioning and cell production process.

# Spiroflow brings power to the people

*National Power's electro-chemical Regenesys system is set to change the way in which we receive our power supply by operating like a giant rechargeable battery. Spiroflow has generated its own contribution to this revolutionary process.*

**N**ational Power has developed a revolutionary large-scale electricity storage process, based on a regenerative fuel cell, which could change the way power systems of the future are planned and operated. At the heart of this new process lies a component manufactured using equipment developed by Spiroflow.

The Regenesys system uses an electro-chemical process and operates like a giant rechargeable battery, storing hundreds or even thousands of megawatt hours of electricity - enough to supply whole towns for hours at a time. The ability to store electricity in this way will bring a multitude of benefits to the power industry and to users.

## Expertise

Spiroflow's solids handling expertise was required in the production of a key fuel cell component. The novel manufacturing process employed demanded precise mixing and delivery of two distinct and differently sized solid powders.

The main powder is received in one-tonne bulk bags. Due to restricted headroom, Spiroflow produced a Type 5 "low loading" discharger, with a removable top frame allowing a forklift truck to lift the bulk bag into place from the bottom of the frame. This means that clearance only has to be as high as the top of the discharger.

When the top frame is lifted into place it docks with a dust-tight seal, before the bag is emptied and its contents conveyed by a flexible screw conveyor to the process. This is done very steeply, with no loss in throughput rate, and the powder is deposited into the receiving hopper of a loss-in-weight feeder.

## Reusable

The minor ingredient is received in reusable drums. A Spiroflow mobile drum tipper places this powder into a 100 litre stainless steel hopper, and a smaller flexible screw conveyor then carries the product to another loss-in-weight feeder.

All the metal contact parts for the

system are stainless steel and the bulk bag discharger ensures dust-free bulk bag emptying.

The loss-in-weight feeders discharge the two powders in precise ratios into a connecting chute where they meet in a rotary sifter. The sifted powders then move to a very gentle mixer where they are completely blended together.

## Process

The key to the whole system is a Spiroflow spreader hopper, into which the blended product is then placed. The spreader provides a very even and accurate discharge of powder across a conveyor belt which carries the powders through the proprietary manufacturing process. The finished component is then assembled into the fuel cell modules for installation into the full Regenesys plant.

The ability to store electricity when demand and costs are low, for later release when demand and prices are high, reduces the need to call up more expensive power plants.

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# COVER STORY: SPIROFLOW



Ingredients are conveyed steeply from source to the process using flexible screw conveyors.



A low loading Type 5 discharger is used due to restricted headroom.

The Regenesys system, which can deliver power instantly, can therefore assist demand planning, improve the use of power station assets so that less capacity is needed, enhance operation and give customers greater security of delivery.

## Confident

National Power is confident that this new technology will change the way power systems are planned and operated around the world.

"It is clear that a lot of people are interested in the benefits this technology can offer", says Philip Johnson, general manager for the Regenesys business.

"It offers developers the choice of building fewer power stations and instead Regenesys to help meet peak demands and maximise investment returns. It allows better use to be made of the cleanest generating plant and can also enhance the value of renewable generators such as wind and solar power".

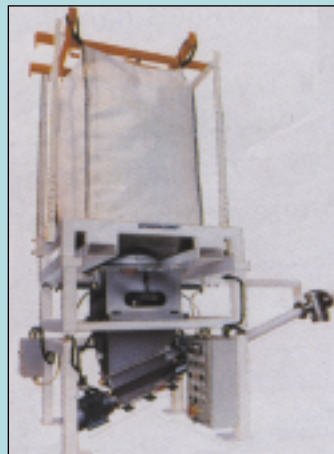
## Discharging with a height restriction

Spiroflow's Type 5 low loading discharger empties bulk bags and sacks in process areas where restricted headroom causes problems in handling bags or where only a low forklift truck is available. The top section of the discharger is a removable frame onto which the bulk bag is loaded at ground level. The frame is spring loaded to tension the bag during discharge.

The frame has fork channels at its base and needs only to be lifted three to four feet onto the discharger base.

The discharger base unit has a dust-tight docking seal onto which the top frame and bag is placed. A spout clamp allows the bag to be untied without dust emission or spillage, via an access door.

When the bag is untied, the access door is closed and the clamp opened to release the bag contents, either partially or fully depending on the flow rate and the flow properties. For poor-flowing or compacted materials, massage plates are fitted to assist flow from the bag.



Removable top section of T5 low loading bulk bag discharger



Spiroflow's low loading bulk bag discharger