



# Shredders and Hägglunds a formidable

## Napier Recovery Systems were invited to develop recycling machines

Article and photo by: Hägglunds Sales Team, United Kingdom.

►► The flexible characteristics and benefits of hydraulic drives are perfectly demonstrated by the mobile tyre shredding plant of Napier Recovery Systems Ltd (NRS) in the UK.

Tyres and other waste products are often stored on airfields, in quarries or landfill sites that do not have adequate electricity supplies to power heavy shredding plant. Therefore there is a market for diesel powered and mobile systems for size reduction equipment to facilitate the recycling of these waste materials.

### Developing new machine solutions

Tyres in particular have become important due to recent legislation that by preventing land filling of tyres want to encourage recycling. NRS were invited to develop

machines for this purpose including car, truck and super single tyres. NRS have been involved in waste reduction and tyre recycling since 1979 using imported shredding machines and reclamation systems including, when necessary, design and manufacturing of equipment to complement the imported items.

### Successful shredding machine leads to new enquiries

The latest project, a twin shaft hook type shredding machine with production capacity of twelve tonnes per hour, for Redscar Tyres Ltd in Preston, followed the success of a machine of similar size for Spay Bay Salvage Ltd in Scotland in 2000. John Edwards of NRS commented "The machine has performed impeccably. It has performed so well that the interest has led to a number of positive enquiries still ongoing."

### Hägglunds hydraulics the choice

On past machines, with mechanical or electric solutions, it was found that the high inertia of the drives imparted very high and unnecessary loads onto shafts cutters and bearings. This caused damage and therefore production losses and high maintenance costs. The Hägglunds hydraulic drive system has almost negligible inertia and very fast pressure control which virtually eliminates these transient forces, resulting in a much more robust reliable and productive machine.

### Easy control of speed

The latest of these machines uses a 275 HP Volvo engine driving tandem open loop piston pumps and tandem gear pump combination. The rotor drives are provided by two Compact CA 210 motors, simply and directly mounted on the rotor shafts, each



To the left the new NRS machine where the rotor drives are provided by two of Hägglunds Compact (CA 210) motors, simply and directly mounted on the rotor shafts. Each individually powered by the piston pumps so that the speeds can be adjusted to give a differential shearing speed between the rotors. To the right, the first machine of this type in Spay Bay, Scotland. Thanks to the success of this machine, more are now being built.

## combination

individually powered by the piston pumps. The speeds can be adjusted to give a differential shearing speed between the rotors. The gear pumps and associated hydraulics control the air blast cooling, the three conveyors as well as the on board crane for feeding the tyres into the shredder.

### Alternative methods investigated for this plant were:

- 1) Diesel mechanical, comprising the engine with a clutch into a large gearbox driving one rotor and bull gears on the rear end driving the second rotor. This arrangement was considered to be unsuitable for the shredder control needed and for reversing of shredder rotors on maximum load.
- 2) Diesel electric; was considered unsuitable for high powered machines due to the size and high cost of the diesel generators, required to cope when the main electric motors went into maximum load conditions.
- 3) The solution chosen was a hydraulic drive system together with a diesel, which gave the best value for money providing full control of the shredding machine, including importantly the ancillary equipment. The compact direct drive offered by the hydraulic drive system and torque characteristics of the hydraulic motors ensured that even at stalling conditions in the shredder, the rotors provided two or three times the nominal torque. This gives a formidable shredding performance and even when something jams in the rotors, the same torque is available in reverse to free up the machine. A feature not available with other systems.