

# DIESEL PROGRESS

聚焦机动设备市场

跨越国界的权威信息平台

## INTERNATIONAL

March-April 2011



Show Issue

# COMMERCIAL VEHICLE TECHNOLOGY

Including the

**2011** Clean Air  
Components Guide



[www.dieselprogress.com](http://www.dieselprogress.com)

## COMMERCIAL vehicles



Groupement Marti Implenia has purchased 10 Astra HD8 trucks for the construction of a pumped-storage underground site of the Nant de Drance hydroelectric power plant. The installation is being built inside the mountain with an access tunnel of 5.6 km. The trucks are operating on demanding 12% steep slopes, powered by a 353 kW Iveco engine with an Allison automatic transmission spec'd for the application.

## CONTINUING TO POWER FORWARD

Astra HD8 trucks work three shifts, 24 hours a day in €682 million 600 MW Nant de Drance hydroelectric power plant project

BY ROBERTA PRANDI

**G**roupement Marti Implenia (GMI) consortium has been awarded a contract for the construction of the pumped-storage underground site of the hydroelectric power plant of Nant de Drance in the Swiss canton of Valais. GMI is composed of German mechanical tunneling company Tunnelbau Marti AG and Swiss road, civil engineering, construction and infrastructure facilities company Implenia Bau AG.

The hydropower plant Nant de Drance is located between two existing reservoirs on the French-Swiss border, between Martigny (Valais), Switzerland; and Chamonix, France. The plant is expected to produce 600 MW of electric power using the pressure of the water falling 300 m between the two basins. The installation is being built inside the mountain at 1700 m above sea level, with an access tunnel of 5.6 km.

The hydropower plant project costs an estimated €682 million and is managed by energy service provider

Alpiq AG, Swiss Federal Railways SBB, and Valais electrical utility company FMV. The plant will generate 600 MW of electrical power to cover peak demand during major railway traffic in Switzerland. The power plant was built to help stabilize Switzerland's electrical grid. The project was started in 2009 and is expected to be concluded in 2017.

"The construction site is located at 2000 m height, and in the winter the access road is impracticable," said Niklaus Zaugg, mechanical engineer at GMI. "For this reason the construction work takes place from April to November, with three shifts covering 24 hours a day. With the strict deadlines for the project completion, we needed vehicles that were reliable, productive and easy to drive."

To navigate the project's demanding tunnels and the power plant's deep caverns, GMI purchased six Astra HD8 trucks. A second order for four additional trucks will be delivered at the end of April.

The 10 Astra HD8 Series trucks are

heavy-duty vehicles with an 8x6 configuration. The trucks feature a 13 L Iveco Cursor turbo intercooler engine rated 353 kW at 1900 r/min. Maximum torque is 2300 Nm.

The 13 L six-cylinder, inline engine features water cooling and electronic-controlled fuel injection with a variable turbine geometry turbocharger. Cylinder heads are set up in a mono-block configuration, with four valves per cylinder. Displacement per cylinder is 135 x 150 mm.

The Astra Series HD8 trucks are Euro 5 compliant with a selective catalytic reduction (SCR) system. An Allison 4700R transmission is coupled with the powertrain.

The Allison 4700 Series automatic transmission has an integrated hydraulic retarder that has been specifically designed to manage the area's demanding 12% steep slopes that lead to the access tunnel, which often needs to be mastered with a fully loaded vehicle, GMI said.

"The road that goes down to the landfill for the excavated material is

## COMMERCIAL vehicles



GMI is also using an Astra HD8 truck in the Swiss Linth-Limmern hydropower plant project. Access to the site is located 2000 m high, requiring a special heavy-duty cableway to literally "fly" the truck over the Swiss Alps for operation.

very steep and the automatic transmission's retarder simplifies operations, while reducing brake wear," said Zaugg.

The Allison 4700 Series transmission also features a torque converter to avoid dry disc clutching. The transmission was also engineered to eliminate maintenance and wear usually associated with clutches and ensures more precise control of the wheels combined with constant acceleration.

According to Zaugg, the transmission was a significant characteristic of the truck purchase for GMI. "Our personnel working in the tunnels are not quite used to driving just any type of truck. Thus, it was fundamental for us to have easy-to-drive vehicles. Only fully automatic transmissions can ensure an operation free of bad surprises, like clutch failures resulting from wrong maneuvers. With the Allison automatics, our operators were able to drive the Astra HD8 trucks since day one."

In the standard truck configuration, the Astra HD8 Series are equipped with a mechanical servoshift ZF transmission with 16 synchronized forward gears and two reverse. ZF's automatic ASTronic transmission is available as an option, along with Allison's fully automatic 4700 Series transmissions.

One of the six Astra HD8 trucks already purchased by GMI is presently being used in another demanding construction project in Switzerland — the Linthal 2015. This a €1.6 billion project for the power uprating of the Linth-Limmern hydropower plant.

The only access to this construction site is located 2000 m high, requiring a cableway or helicopter for entry. All machinery for the construction site is being transported with special heavy-duty cableway that literally made the Astra HD8 truck "fly" over the Swiss Alps. ♦

**diesel Weblink**

[www.astraspa.com](http://www.astraspa.com)

SEE DIRECTLINK @ [WWW.DIESELPROGRESS.COM](http://WWW.DIESELPROGRESS.COM)

# 10,206

kilograms to load  
and move every  
20 seconds

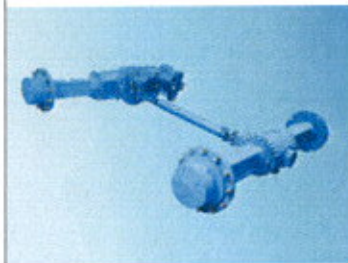


**1** tough  
drivetrain  
system

### TECHNOLOGY THAT DRIVES PERFORMANCE.

Construction equipment must perform in extremely demanding environments, and every component has to be as tough as the conditions. Dana products are engineered to provide exceptional durability, as well as versatility and ease of service. Whether you need single-reduction and planetary axles, powershift transmission, torque converters, or driveshaft assemblies, Dana engineers highly innovative modules and systems for all product families.

For more information, visit [www.dana.com/offhighway](http://www.dana.com/offhighway).



*Our wide range of proven product models is optimally configured to each specific application as an integrated system.*

#### Construction

Agricultural

Mining

Forestry

Material Handling

Outdoor Power

Leisure/Utility



## SPICER®

Off-Highway Products

© 2011 Dana Limited