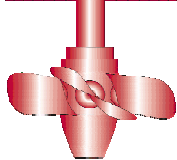


# MJ2 TECHNOLOGIES S.A.R.L.

## TURBINE DE TRÈS BASSES CHUTES, VERY LOW HEAD TURBINE: NEWS LETTER N° 10

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### HYDRO 2011



*HYDRO 11  
Prague 17 to 19<sup>th</sup> October  
Come and visit us  
on our boot*



[www.vlh-turbine.com](http://www.vlh-turbine.com)

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## THE VLH SETS A NEW FISH-FRIENDLINESS STANDARD

Dear Friends and Partners,

MJ2 has just completed two years of industrial development. (see next chapters)



Villa d'Alme HPP

At the beginning of 2011, 15 VLHs have been installed and approved, and 2 others are due within the next 2 months. This year, we will be way over the threshold of 20 installed machines.

To face this significant development, MJ2 has welcomed new staff members. By the end of the year, we will be more than 15.

Before talking about the future, let us first look back on 2010, which has been full of major achievements.

The first one, chronologically, has been the commissioning of our first VLH outside of France, a 500-kW DN 4500 for the Montodine power plant, in Italy. A second VLH has been commissioned in Italy, in September, on the tail race of the Villa d'Alme power plant, near Bergamo.

From the beginning, the VLH project has a clearly international scope. Foreign markets will rapidly amount for a major part of our sales. In 2011, we will commission our first two VLHs in Belgium and we will start the manufacturing of 4 DN 5000 VLHs for Poland.

A second very important milestone for the

development of our project has been the trust placed in us by EDF (Electricité de France) through its subsidiary company SHEMA, which has placed a firm order for 14 VLH units equipped with the vertically pivoting guard gates that we have de-



Eel passage test 10/2010

signed. This project, which will complement the first two units delivered on the Mayenne river, will provide the harnessing of the 16 Mayenne sills with VLH turbines.

The fish-friendliness of the VLH has been a key factor in this choice for the harnessing of a river where eels are a sensitive issue. Its visual integration in a well-preserved landscape was also an important element for its selection.

Finally, in October, we have carried out tests of eel passage through the new hydraulic profile of the latest-generation VLHs on the Frouard hydroelectric power plant site, on the Moselle river.

The results, which are now official, speak for themselves: Survival rate 100 %.

The VLH is setting a new fish-friendliness and environmental integration standard.

Enjoy reading this letter

Marc Leclerc  
General Manager

## 2<sup>nd</sup> EEL PASSAGE TEST

The Frouard hydroelectric power plant is located on the Moselle river. This project has been disclosed in our previous Newsletter.



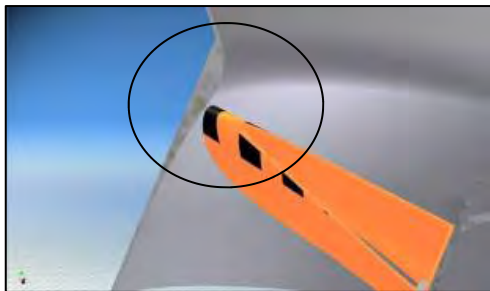
General view of the Frouard SHP

Once the equipment has been tested, the official tests were carried out in October. The system of injection at several points and



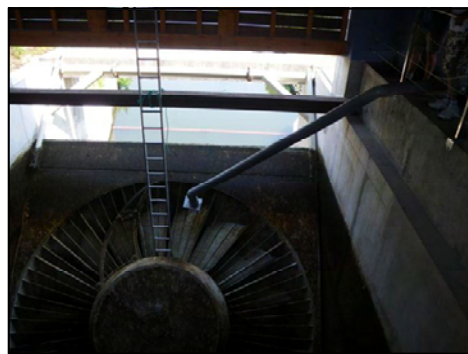
Downstream view of the Frouard HPP tailrace

The power plant comprises a 400-kW DN 4500 VLH under a 2.5-m head. This latest-generation VLH is provided with a



Discharge ring spherical profile

the recovery device are very similar to those used in the first 2008 tests in Millau on the Troussy VLH. After each specimen has been measured and inspected, the eels were dis-



Installation of the eel injection device

discharge ring having a spherical shape at the transition between the inlet cone and the actual discharge ring.

As in the first Millau tests, a first series of tests intended to try the equipment and the

tributed in batches and were directly introduced into the VLH immediately upstream of the guide vanes through a Ø 200 PVC tube.



Frouard VLH out of the water



Installation of the recovery device: net frame, net, and floating pontoon

scientific protocol has been carried out in June 2010.

The injection point could be displaced along the distributor spoke. 4 different points have been used in Frouard.

*"2<sup>nd</sup> live eel passage test"*

## 2<sup>nd</sup> EEL PASSAGE TEST

This 2<sup>nd</sup> test is the result of an international cooperation. A scientific committee has been formed, comprised of the best



VLH in operation, with installed injection system

French specialists of hydroelectric turbine crossing, from the ONEMA, and of German and Belgian scientists. Further, a team of Polish specialists and members of the Commission internationale de protection de la Meuse et de la Sarre (CIPMS) have also attended the tests.

244 eels have been fished in Germany and transported to the Frouard site where they



Storage tanks with weirs

have been housed, with a water supply from the Moselle. The storage water parameters, such as temperature and dissolved oxygen rate, have been controlled.



Installation of the net by means of the crane

The eels have been introduced by hand into the injection system.

They have then been recovered in the fish box installed in the floating pontoon con-



Introducing the eels by hand

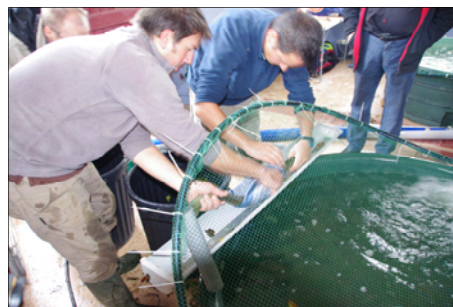
nected to the outlet of the recovery net.

The recovered specimens have then been examined and placed back in their housing



Eel recovery in the floating pontoon fish box

to remain under observation for 48h.



Examination of the recovered eels

Outcome of the tests: After the tests and 48h of observation, **no direct mortality has been observed** for the 200 injected eels.

The VLH thus gives the proof that hydroelectricity is not incompatible with the protection of fishery species.

*“a European scientific committee formed of German, French, and Belgian specialists »*

*“A 0 % mortality, beyond all expectations »*

## HISTORIC AGREEMENT WITH SHEMA

In April 2007, even before the Millau prototype was commissioned, SHEMA (100 % EDF subsidiary exploiting 75 SHPs in France) has placed an order to MJ2 for the first so-called second-



La Roche SHP Upstream view

generation VLH, a DN 3550 intended to harness the Moulin Laroche site on the Mayenne.

for 14 DN 3550 VLHs and their gates to totally reharness the 16 SHPs exploited by SHEMA on the Mayenne.



Typical existing Mayenne plant

This order, of key importance to MJ2, will span over 3 years. SHEMA has entrusted the construction works to the EIFFAGE TP– MJ2 consortium.

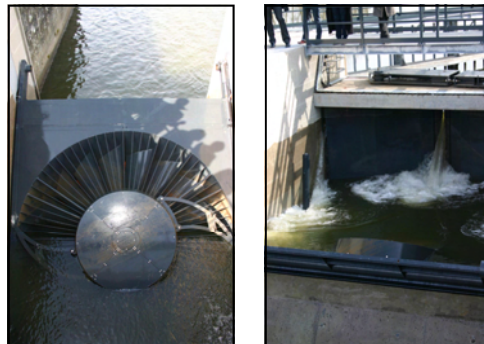
The fish-friendliness of the VLH has been a key factor in this decision. Indeed, the Mayenne river is listed as heavily migratory with the presence of eels. The installation of fish-friendly turbines was a prerequisite for the Conseil Général de la Mayenne (Mayenne General Council), owner of the works, the ONEMA, and the DDT to prorogate administrative authorizations.

*“14 more VLHs to harness the 16 Mayenne locks and dams”*



L'Ame SHP downstream view

In February 2009, SHEMA has ordered a second DN 3550 VLH, equipped with vertically pivoting upstream gates designed and manufactured by MJ2. This equipment is the second one on the Mayenne to be provided with a VLH.



L'Ame VLH and opening upstream gates



Installation of the Ame VLH in January 2010

MJ2 is really honored by the SHEMA's confidence.

This first massive order will be an occasion to install the VLH assembly shop and to pursue as far as possible the industrialization of our concept.

In October 2010, SHEMA has placed an order

## OTHER PROJECTS ACHIEVED IN 2010

In 2010, MJ2 has delivered 7 VLHs, 5 of which are operating - the two machines intended for the Belgian Marcinelle site have not been installed yet due to a significant delay in civil works.



Montodine power plant, South of Milan  
A VLH DN 4500 and 500 kW

The Ame VLH has been the first to be installed (see above chapter), followed by the two machines installed in Italy in Montodine and Villa d'Alme.



Villa d'Alme power plant (Italy)

Then, the Saint Jean de Rives VLH on the Agout has been commissioned. There, a pneumatic vertical-axis Kaplan turbine has been replaced with a 500-kW DN 4500 VLH.



Saint Jean de Rives before renovation

The site has also been harnessed with up-

stream gates having a vertical swivel axis like the two Italian power plants and the



St Jean de Rives equipment room

Ame site on the Mayenne. Such gates, designed and installed by MJ2, have the advantage of being totally submerged, even in open position, and thus are as visually inconspicuous as the VLH. The ancillary equipment has been housed in a prefabricated 19 m2 room installed on a wooden platform above the maximum flood level.



Saint Jean de Rives after renovation

Then, the 2 DN 4000 VLHs installed on the Terrasson site on the Vézère river have been commissioned. A specificity of the installed machines is their stainless steel supporting structure.



Terrasson power plant

*"2 VLHs  
commissioned in  
Italy"*

*Full configuration with  
upstream gates and  
prefabricated room in  
St Jean de Rives.*

*Stainless steel  
distributor for  
Terrasson"*

## EXPANSION OF OUR EXPORT SALES

*“First contract signed in Poland”*

In January 2010, MJ2 has signed its first VLH supply contract with a Polish client. The agreement provides the supply of 4 VLHs 380-kW DN 5000 for the Lipki site on the Oder.

The administrative file is being reviewed. The design of the VLHs and of their implantation has been done in 2010. Their manufacturing will start in the second half of 2011.

Poland offers a great potential of implantation of VLHs on the numerous low-head works scattered on its large rivers. Its geography and pluviometry are very favorable for our VLHs. Other projects involving the

VLH technology in this country are currently being reviewed.



Lipki before right bank development

## NEW PREMISES NEW ACTIVITY

On December 23, MJ2 has moved to La Cavalerie, a Templar village on the Larzac, 15 km south of Millau, next to the A75 highway.

The new premises include a 800-m2 assem-

centrated our design office, our assembly and test site in a same location to bring together the design and production and thus further pursue our ongoing improvement and industrialization process for the

*“Creation of the VLH assembly shop in our new premises on the Larzac Plateau”*



New MJ2 premises at La Cavalerie



Entrance hall to the office area

bly hall provided with 32 T lifting capacities, and 200 m2 of office space, as well as an outer hard-surfaced storage area of more than 500 m2.

MJ2 will thus start its own VLH assembly activity. We will develop new industrial tools and test beds adapted to the specificities of the VLH concept. We have con-

VLH concept.

## A VLH ON DISPLAY

In September, one of the Marcinelle VLH bulbs has been on display at the SIANE fair in Toulouse, on the Ets Labarthe stand. We thank Jean Marc for this wonderful advertising.



VLH bulb displayed at the SIANE fair

**MJ2 TECHNOLOGIES  
S.A.R.L.**

Route de Millau  
Z.A. Millau Larzac  
12230 La Cavalerie  
(France)

Tél: + 33 565599946  
Fax: + 33 565628442

email :  
marc.leclerc@vlh-turbine.com

Web: www.vlh-turbine.com



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