DOWNSTREAM FISH MIGRATION ALONG THE LOW MEUSE RIVER

Action C2

Operation report of the bubble barrier during 2019 migration periods

Deliverable – Operation report during 2019 migration periods

Révision				
Ind.	**Date**	**Published by**	**Checked by**	**Remarks**
0	18/11/21	Lorenz Leyssens		First version

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I. Introduction

Following the selection of the bubble barrier solution at the Ivoz-Ramet pilot site, the commissioning of the solution took place in September 2019.

This submerged air bubble curtains formed a linear barrier used to control the movements of fish and direct them away from hydropower plant. The barrier comprises a pipe pierced with holes and positioned on the bottom of the channel. Compressed air is forced into the pipe, creating a bubble curtain with sound, light coming from the bubbles and the bubbles itself, that discourages fish from crossing. The objective of the barrier was to redirect the fish to the dam.

Unfortunately a few time after the commissioning, the pipe broke at several section and we were never able to test the solution.

II. Incident

In the second pilot site of Ivoz-Ramet, the bubble barrier has been started on the 20th September 2019. Due to an increase of discharge of an annual amplitude, the bottom air pipe has been destroyed in a short delay (less than a month).

The malfunction highlighted was a poor distribution of bubbles during use. This suggested either a tear or poor pressure distribution. The tears was probably caused by debris and by friction with the concret.

Therefore the barrier was not operational from 30th November 2019. In this short interval, 15 eels migrated across Ivoz-Ramet power plant: a turbine passage was determined for 12 of them and very likely for the 3 others. The 2D tracks of eels could not reveal any avoidance behaviour of the system. Consequently, no efficiency has been observed, but the number of observed eels is low.

The bubble barrier installed on Ivoz-Ramet has shown a very poor reliability. After many checks, the malfunctioning is clearly linked to the quality of the pipes where several breaches on the pipe appeared (see pictures below). Indeed, despite our efforts to repair the pipes the effectiveness of it couldn't be demonstrated. The constructor gave no guarantee of efficiency.

Breach and deformation of the air supply pipe

Damage to the bubble pipe at the bottom of the river

A dispute with the supplier also occurred due to the very bad quality of the product. Indeed, we had to pay for the installation of the system 160.513,75€. Moreover, we had to replace some parts and repair the pipe. We engaged 9.927,39€ in supplement. In addition, we had to mobilize our team to follow the works for the installation and to try to make the barrier work.

We had long discussions with the supplier about the water flow conditions in the Meuse and the installation of the barrier. We crosschecked the information with the University of Liege and our internal experts. After many meetings it appeared that the conditions communicated in the tender and before the installation were the right ones. The malfunctioning is not the fault of Luminus and the project partners.

We filed a formal claim to Apumas to reclaim the extra costs engaged. An agreement was finally reached to close the dispute.

III. Conclusion

The partners discussed trying the experiment again at another site. It has been decided to abandon the solution for the Ivoz-Ramet site.