



Biofilm colonizing the Nam Theun 2 power plant Penstock (Lao PDR) – mechanism and potential evolution

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BACKGROUND

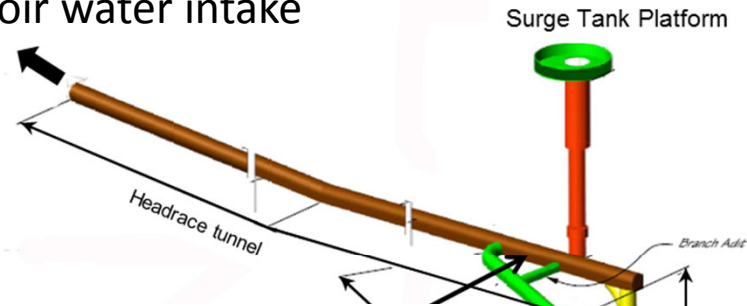
- ↘ hydraulic performances
 - Biofouling
 - Microbial biofilm(s)

DESIGN OF THE STUDY

- Characterization of biofilm populations
- Biofilm samples and analysis during cool-dry seasons outages
- **2012 campaign 2012 (January 14th to January 16th): direct microscopic observations and qPCR analysis**

Date	Site	Sample's description
01/21/2012	Intake water	2x100 mL

Reservoir water intake



Head Race: concrete (T0-T48h)

Lining: reinforced concrete
 Diameter: 9.2 m
 Slope: 0.5%
 Pressure: 11.5 bar
 Water velocity: 4.7 m/s

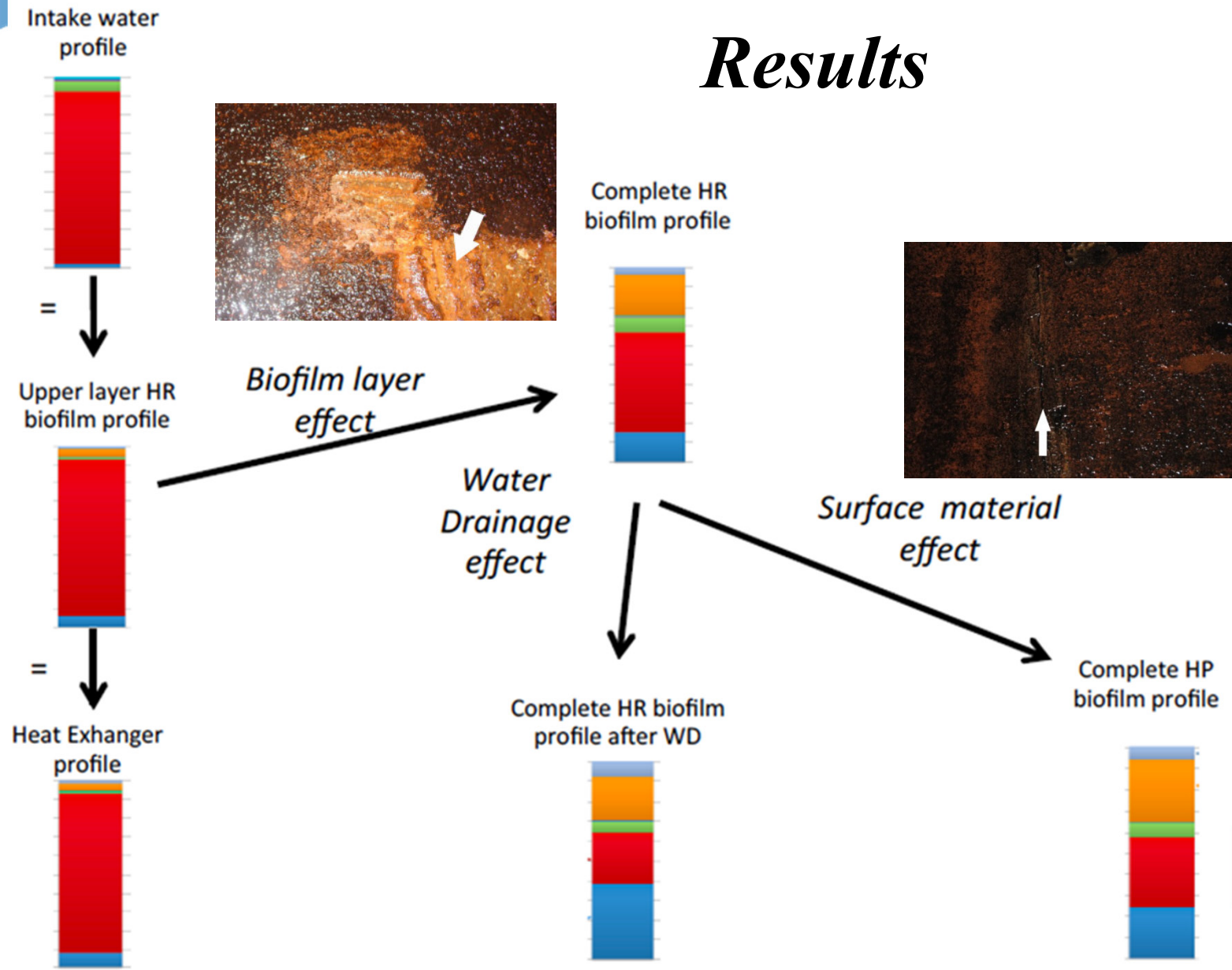
Head Race: concrete/
 galvanized steel (T24-T48h)

Lining: steel pipes
 Diameter: 7.15 m
 Slope: 1.1%
 Pressure: 34 bar
 Water velocity: 7.8 m/s

Date	Surface	Sample's description
01/14/2012	Concrete	Top part of biofilm
	Concrete	Complete biofilm
01/15/2012	Concrete	Top part of biofilm
	Concrete	Complete biofilm

Date	Surface	Sample's description
01/15/2012	Concrete	Top part of biofilm
	Concrete	Complete biofilm
	Galv. Steel	Complete biofilm
01/16/2012	Concrete	Complete biofilm
	Galv. steel	Complete biofilm

Results



And to conclude ...

- Biofouling treatment
 - ➔ Chemical treatments (biocides)
 - ➔ Mechanical treatments (abrasives)
 - ➔ Nutrient starvation
 - ➔ **Hydraulic variations**
- Biofouling prevention
 - ➔ **Hydraulic maintaining**
 - ➔ **Antifouling paints**