



The Saint-Avertin connection between Atlantic HSL and SEA HSL, a sector hydraulically constrained

Julien Baron

SYSTRA, Technical Direction – Railway Infrastructures Department, France (jbaron@systra.com)

Abstract: The new high-speed line (hsl) in France from Tours to Bordeaux (the South Europe Atlantic or sea hsl) connects to the existing French Atlantic high-speed line (from Paris to Tours) along a cutting through the Saint-Avertin district, close to the Tours ring road (rd37). This layout required the construction of drainage structures that do not comply with specifications, which led to implement special studies to ensure that drainage issues were adequately managed and that stability were checked within this complex zone. Tests were conducted to cover all possible conditions including the most extreme ones. While conducting these studies, we raised questions about how to interpret the specifications and how to control the risks, which we would like to share through two case studies:

The storm water retention pond bhd 0011-1 is located at the lowest point of the cutting which is a departure from the standard and requires to be fitted with pumps. The lack of gravity solutions has been justified and risks analysis has been performed for the system considering the flooding of the platform and to justify the non-implementation of a flood warning sensors. The retention pond bhd hl 0008-1 intricately fitted between infrastructures is specific for being located very close to the top of the cutting and in a position resembling an embankment. Further studies of drainage, geometric calibrations and calculations of geotechnical stability were carried out to justify the solution chosen and to demonstrate the lack of unacceptable risks.

The two concerning ponds are included in the safety record of Cosea/Lisea and have been reviewed with Certifer. It has been thoroughly demonstrated the adaptation and the robustness of the final constrained infrastructure configuration against heavy rain natural hazard and it leads a methodological feedback.

Key-words: hydraulic and geotechnical stability risks, transport infrastructure standard, specific studies, risk analyses, heavy rain and extreme occurrence, bottom and top of cutting, railway high-speed lines.

Fyi: this abstract has been the subject of an article and an oral presentation for the international symposium Georail 2017 (T1: Design of new railway lines)