

BOMBARDIER



Master's Thesis:

Energy Harvesting for health monitored Balises

Background

Bombardier Transportation is a global mobility solution provider leading the way with the rail industry's broadest portfolio. It covers the full spectrum of solutions, ranging from trains to sub-systems and signalling to complete turnkey transport systems, e-mobility technology and data-driven maintenance services. Combining technology and performance with empathy, Bombardier Transportation continuously breaks new ground in sustainable mobility by providing integrated solutions that create substantial benefits for operators, passengers and the environment.

A Balise is a transponder used as a beacon in many train signal systems in the world, Among them, the European system: ERTMS. This system is passive and get activated only when a train runs over it, by a train equipped with a Balise reader.

It would be interesting to get information from the balises even when they are not activated by a train. The operators could get health-monitoring information from balises and they could service them before they stop working. In the end, this would lead to more reliable railway network.

The challenge to solve in this master thesis project is to provide energy to the balises.

Objective

The objective of this master thesis is to evaluate all the energy harvesting solutions and see if we could use them in the future in Bombardier's future balises.

The work environment (the railway) will be a key aspect to understand to be able to evaluate the energy harvesting solutions. Another aspect to evaluate is the energy needs to power supply a communication modem.

The project will consist in the following tasks:

1. Do a technological survey of the energy harvesting solution available on the market and in development in the research institutes and the industry (research part)
2. Based on the results in part one, make a compatibility study to understand which solution could work on which type of railway and country. (research part)
3. Evaluate the energy needs of standard wireless communication systems.

4. Make a model with one of the most relevant energy harvesting solution and demonstrate.

Application

The candidate shall have studied electrical engineering, embedded system, electronics or similar at a Bachelor or Master level

For more information, contact

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