

**New York State  
Environmental Investment Program  
Research Project Summary**

NP&G Innovations, Inc.

**Project Background**

NP&G Innovations was started in 2003 by its owners, Cal Nichols, Lucian Gilbert and James Pike. The purpose of the company is to develop and commercialize an alternative railroad cross-tie called TireTie™ made with recycled tire treads as the main component. In a prior project, NP&G developed a prototype tie. NP&G still needs to submit a significant quantity of TireTie™ units to AREMA (American Rail Equipment and Maintenance Association) for testing to confirm that the product meets the industry's standard performance requirements. During the manufacturing of the TireTie™ to date, only twenty percent of the slit tire sections met the company's straightness specification. This led to increased manufacturing inefficiencies and costs. The goal of this project was to develop and demonstrate a slitting concept to address this issue.

**Project Description**

During the project, the following tasks were completed:

- Slit treads were analyzed to determine why they were curved after the slitting operation.
- The company met with a tire re-manufacturer that slits tire treads to observe techniques used in the slitting operation.
- Root Cause Failure Analysis was performed on slit tires that did and did not meet NP&G's straightness specification.
- Tire slitting equipment available on the market was benchmarked via patent and literature searches.

- Design concepts were generated that would employ what was learned in the analysis to accomplish straight tread sections.
- Equipment was purchased and modified to slit straight treads.
- Several treads were slit to evaluate the equipment modifications and determine additional changes to be considered in the re-design.

**Project Results**

As a result of this project, NP&G was able to determine why treads were not straight and identify the most appropriate equipment configuration to address this, including many design specifications. The modified slitter, however, even with improved guides and more powerful gear ratios was under-powered, making it sensitive to operator technique and tread thickness.

**Next Steps**

NP&G needs to design and build a more robust piece of equipment capable of using what was learned in this project. This new machine will be operator friendly, have more power, an adjustable cutting width, improved tire guiding, and hydraulic power. The final machine design should also incorporate considerations for robotic loading and the ability to handle a range of tire sizes. These final corrections will address the material handling aspect of loading and unloading tires efficiently.

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**Contractor:** NP & G Innovations

**County:** Monroe

**ESD Region:** Finger Lakes

**ESD Contact:** 518/292-5340

**NYS EIP**

**Investment:** \$50,000

**Contractor Match:** \$50,000

**Total:** \$100,000

**Completion Date:** April, 2013