Arcelor-Mittal Fall Prevention Project

Overview
Arcelor-Mittal is a steel manufacturing company. In the facility, workers must climb to top of the fully loaded car containing rails and secure the bands, which are more than 48" above the ground. OSHA regulations require a safety system to protect the workers in case of falling. Our goal is to design a portable and safe fall prevention system, which enables workers to load on the cargo train while satisfying the OSHA requirements.

Objectives
The goal of this project is to design a fall prevention system for workers during the banding process. The system must satisfy all of the relevant OSHA safety requirements including pipe dimension and force limitation, while also working within the limits of the loading process. Our design demonstrates a concept spanning Industrial Engineering and Mechanical Engineering. We practiced various engineering techniques and methodologies to design a fall prevention system.

Approach
We visited the sponsor and gather data from them. Also based on the specific requirements provided by the sponsor and looking into the OSHA requirements for fall prevention, we did corresponding concept generation and selection. In general, our final deliverables are:
- Solid Works CAD model with project specifications
- Three views drawings
- Physical model
- Cost estimation
- Safety analysis

Outcomes
Finally, our design satisfies the OSHA requirements, and it turns out to be a portable system without unduly affecting the efficiency of the workers.
- Based on cost analysis, the system will cost approximately 3000 USD to produce in house.
- The system is proved to meet the OSHA requirements with good stability and can be portable,
- The system will be satisfied to meet the company’s needs.