PURDUE UNIVERSITY

CAPSTONE EXPERIENCE 2014
ADM Railcar Camera

Agricultural & Biological ENGINEERING

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Problem Statement:

ADM presented a task to design a camera mount to support a camera and any additional equipment needed for the collection of data, placed above rail cars in order to determine that the rail car is empty of any contaminants before the rail car reached the fill station. This camera would streamline the loading process to ensure there are empty railcars ready to be loaded. The camera mount and system should be capable of viewing live feed from a remote location near the loading site as well have the capability of recording the data for record keeping purposes.

Problems

•Dust was a concern until the facility manager assured us that the dust system kept all dust particles at a minimum
•The light discrepancy during different times of the day was a concern.

Budget

•ADM provided the camera as well as a monitor for the project.
•The camera provided allows for remote control of the movement of the camera.
•There was $200 allotted through the ABE department to be used for steel, wiring, hardware and other necessities.

Constraints

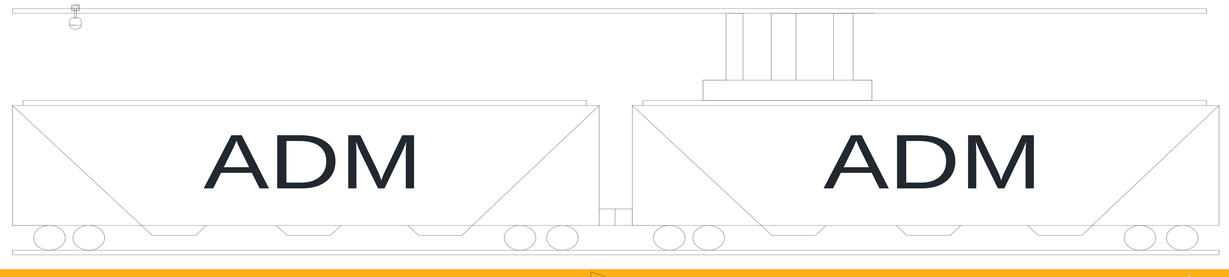
•The mount must be clear of the existing fall protection system
•The camera should be attached without welding or drilling into existing structure
•Must provide clear view of inside railcar

Alternative Solutions

•The camera could have been mounted on the structure of the building.
•A different clamp design could have been used.

Federal Grain Inspection Standards

•Cameras must be mounted so they do not create hazards or interfere with fall protection cables. The recommended mounting height is approximately 10 feet above the railcar.
•At a minimum, the video system must view the entire bottom gate of a compartment and a portion of the sides, as well as the condition of the compartment covers. The official service provider (OSP) may determine the required view of the compartment slides. Cameras may require pan and tilt capabilities, or multiple cameras may need to be installed to achieve adequate images.



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Think impact: