Aluminum Stamping Scrap Segregation

Overview
Most scrap handling systems inside of GM stamping facilities were originally designed to handle one type of metal (steel), while some current systems can handle two (steel & aluminum). New GM stamping facilities need a feasible and cost effective solution to transport and segregate 3 types of scrap metal into recycling trucks. Each recycling truck must contain only one type of metal scrap, and inter-metal contamination in the recycling trucks must be less than 1%.

Objectives
To design scrap handling systems for a new GM Stamping Facility. These scrap handling systems must be able to transport, sort, and adequately deposit scrap of three metals into their respective recycling trucks, in a feasible and cost-effective manner. Each system will then be evaluated so to determine the best one.

Approach
• Brainstormed and generated possible methods for segregating three types of scrap metal
• Visited the GM stamping facility in Lordstown, OH
• Performed research to determine existing systems, and see if they can be applied for this project
• Submitted a project proposal to sponsor, as a means to verify that both parties had the same expected deliverables in mind
• Developed seven possible systems to handle the scrap at the stamping facilities
• Created graphical representations of all seven proposed concepts (with PowerPoint)
• In collaboration with the sponsor, created a comparison rubric to use for evaluating each proposed concept
• Graded each system with the rubric, and then compared the results of each system to determine the best system
• Summarized all our work and finding in the Final Report submitted to sponsor

Outcomes
#1 Recommended Design:
(3 small belts w/ shredders & diverters)

Advantages
• Simple design (similar to existing scrap systems)
• Minimal contamination between metals
• Low Cost
• System can easily handle additional lines by adding a shredder, large, belt, and diverter

Disadvantages
• Large Space required (shredders, diverters, multiple conveyor belts)
• Space availability limits the number of metals the system can handle
• High impact on system if one conveyor breaks down

Recommended Scrap Handling System

1. Scrap falls from press lines through shredders to reduce scrap size
2. Scrap from each line travels on a large conveyor belt to the diverters
3. The diverters redirect scrap onto appropriate small conveyor belt based on type of metal
4. Each small belt leads the respective scrap to its corresponding recycling truck in the scrap house