Locomotive Collision Test #5

Inline Collision of a Freight Locomotive with an Unloaded Flat Car

Test #5: Set-Up

2 Loaded Hopper cars

Test Locomotive (SD-45, front end converted to SD-70)

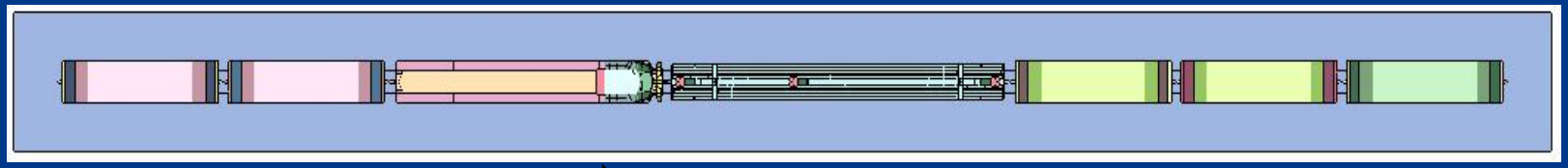
Unloaded Flat Car

~30 Loaded Hopper Cars

Collision Speed - 40 mph

Bullet Consist

Target Consist



~40 mph → Stationary

Test #5: Pre-Test Photos

Locomotive consist alignment with flat car consist

Height of flat car deck is below the base of the locomotive anticlimber

Test #5: Post Test Photos

- Locomotive was lifted up from its front truck
- Cab, hood, and anticlimber not significantly damaged

Test #5: Post-Test Damage Photos

- Failure of the flat car's draft stops allowed the locomotive to push the flat car forward and into the hopper car

Impact end draft pocket

Trailing end draft pocket

Test #5: Outcome

- What did we learn from this test?
  - The flat car did not buckle as anticipated
  - The flat car overrode the hopper car
  - The behavior of the flat car was different from that of the car in the Phoenixville, PA accident (August 23, 1996)
    - This is attributed to the test flat car having friction draft gears with a relatively small stroke compared to the Phoenixville scenario which had end of car cushions with a longer stroke
  - The anticlimber prevented the flat car from climbing up the face of the locomotive