

**APPENDIX A**  
**EEC APPROVAL LETTERS FOR ATLAS RAILCAR (SINGLE-CAR TEST AND POST-  
TEST ANALYSIS)**



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File 209.240

Dr. Patrick Schwab  
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Subject: AAR Standard S-2043 Approval of DOE Atlas Railcar Single Car Tests

Dear Dr. Schwab,

The AAR Equipment Engineering Committee (EEC) has completed their review of the following S-2043 Reports:

- S-2043 Certification Tests of the United States Department of Energy Atlas Railcar Design Project 12-Axle Cask Car submitted in TTCI Report P-21-037
- Atlas Car Post Test Analysis Report submitted in TTCI Report P-21-042
- The expert reviews of the same reports conducted by Objective Engineers, Inc.

The EEC hereby approves the results which demonstrate that the requirements of the following sections of Standard S-2043 have been met:

1. Paragraph 5.1 Vehicle Characterization
2. Paragraph 5.2 Nonstructural Static Tests
3. Paragraph 5.3 Static Brake Tests
4. Paragraph 5.4 Structural Tests
5. Paragraph 5.5 Dynamic Tests

EEC's acceptance of specific test results and guidance (as necessary) follow, organized by the relative section of Standard S-2043:

- Paragraph 5.5.7 Hunting  
The hunting measured with the CSM 58 adapter pad was mild and does not present safety concerns. Additionally, the conditions that the car hunted in test will not be encountered in service (i.e. operating at speeds above 65, use of wide flange worn wheelsets with a conicity prone to hunting). The operating plan must include a maximum speed to avoid the speeds at which hunting was encountered.
- Standard Chapter 11 Constant Curving  
Test results were produced using the CSM 70 adapter pads. The CSM 58 pads provide better curving as shown by modeling results. The EEC considers this requirement to be met by use of the CSM 58 pads.

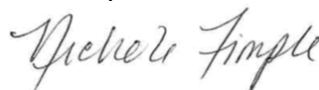
- 5.2.1 Truck Twist Equalization  
Most cases of this very severe requirement were met. EEC understands why the center truck of a tri-span bolster would have difficulty meeting the requirement. Values found were 10-17 percentage points less than allowed by S-2043. A minimum of 24% of the static load was still carried, which is reasonable. This is a stationary test, and the EEC accepts the results based on the more important dynamic aspects of proper equalization were shown to be acceptable by performance in:
  1. 5.5.15 Curving with single perturbation
  2. 5.5.10 Dynamic curving, and
  3. 5.5.14 Limiting spiral
- 5.5.15 Curving with Single Rail Perturbation  
Testing did not meet criteria using the CSM 70 and CSM 65 pads. However, modeling with the CSM 58 pad produced successful results for wheel/rail forces. The EEC considers the wheel/rail force requirements to be met. The car body roll angle that does not meet in modeling with a 3-inch perturbation is simply an effect of local track geometry that cannot be addressed realistically. The EEC accepts the roll angle results as they are.

The Atlas Railcar test results and models are considered by the EEC as satisfactory, and the latest dynamic models are approved to use for project analysis going forward.

The Atlas Railcar is now approved to proceed to the Multiple-Car Test phase of Standard S-2043. The EEC agrees with the expert review recommendations that during multiple car testing the Atlas car be stopped in the TTC WRM 12 degree curve, the local depot activity 10 degree curve, and the BNSF Alps N.M. horseshoe 10 degree curve (if possible), and the car slowly pulled through the exit spiral of the curve while gage spreading and gage spreading forces are monitored.

If you have any questions, please contact Mr. Jon Hannafious of our MxV Rail subsidiary at (719) 251-6571.

Sincerely,



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NF/jsh

cc: Karen Carriere, MxV Rail  
David Cackovic, MxV Rail  
Equipment Engineering Committee