Federal Railroad Administration
Office of Safety
Headquarters Assigned
Accident Investigation Report
HQ-2005-82

Union Pacific (UP)
Sibyl, Arizona
September 25, 2005

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File # HQ-2005-82

1.Name of Railroad Operating Train #1 Union Pacific RR Co. [UP]	1a. Alphabetic Code UP	1b. Railroad Accident/Incident No. 0905TS014
2.Name of Railroad Operating Train #2 Union Pacific RR Co. [UP]	2a. Alphabetic Code UP	2b. Railroad Accident/Incident 0905TS014
3.Name of Railroad Responsible for Track Maintenance: Union Pacific RR Co. [UP]	3a. Alphabetic Code UP	3b. Railroad Accident/Incident No. 0905TS014
4. U.S. DOT_AAR Grade Crossing Identification Number	5. Date of Accident/Incident Month 09 / Day 24 / Year 2005	6. Time of Accident/Incident 12:48: ☑ AM ☐ PM

7. Type of Accident/Indicent *(single entry in code box)*: 1. Derailment; 2. Head on collision; 3. Rear end collision; 4. Side collision; 5. Raking collision; 6. Broken Train collision; 7. Hwy-rail crossing; 8. RR grade crossing; 9. Obstruction; 10. Explosion-detonation; 11. Fire/violent rupture; 12. Other impacts; 13. Other *(describe in narrative)* — **03**

8. Cars Carrying HAZMAT	9. HAZMAT Cars Damaged/Derailed	10. Cars Releasing HAZMAT	11. People Evacuated	12. Division
5	0	0	0	Tucson Service Unit

13. Nearest City/Town	14. Milepost *(to nearest tenth)*	15. State Abbr	15. State Code	16. County
Benson	1047.7	N/A	AZ	COCHISE

17. Temperature (F) *(specify if minus)*	18. Visibility *(single entry)* 1. Dawn 2. Day 3.Dusk 4.Dark	Code	19. Weather (single entry) 1. Clear 2. Cloudy 3. Rain 4. Fog 5.Sleet 6.Snow	Code	20. Type of Track 1. Main 2. Yard 3. Siding 4. Industry	Code
70 F		4		1		1

21. Track Name/Number	22. FRA Track Class (1-9, X)	Code	23. Annual Track Density *(gross tons in millions)*	24. Time Table Direction 1. North 3. East	Code
Main Track No 1		3	39		4

OPERATING TRAIN #1

25. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip.	Code	26. Was Equipment Attended? 1. Yes 2. No	Code	27. Train Number/Symbol
	1	1	1	ICXLB-21

28. Speed *(recorded speed, if available)* R - Recorded E - Estimated			Code
	19	MPH	R

29. Trailing Tons *(gross tonnage, excluding power units)*: 2112

30. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; c. Auto train stop; d. Cab; e. Traffic; f. Interlocking; g. Automatic block; h. Current of traffic; i. Time table/train orders; j.Track warrant control; k. Direct traffic control; l.Yard limits; m.Special instructions; n. Other than main track; o. Positive train control; p. Other *(Specify in narrative)*

Code(s)				
e	N/A	N/A	N/A	N/A

30a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable; 2 = Remote control tower; 3 = Remote control transmitter - more than one remote control transmitter; 2. South 4. West: **0**

31. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*
(1) First involved *(derailed, struck, etc)*	N/A	1	no
(2) Causing *(if mechanical cause reported)*	0	0	N/A

32. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.

Alcohol	Drugs
0	0

33. Was this consist transporting passengers? (Y/N): N

34. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	2	0	0	0	0
(2) Total Derailed	0	0	0	0	0

35. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	43	0	2	0	0
(2) Total Derailed	0	0	0	0	0

36. Equipment Damage This Consist	37. Track, Signal, Way, & Structure Damage	38. Primary Cause Code	39. Contributing Cause Code
2017	0	H605	H999

Number of Crew Members

40. Engineer/ Operators	41. Firemen	42. Conductors	43. Brakemen
1	0	1	0

Length of Time on Duty

44. Engineer/Operator	45. Conductor
Hrs 5 Mi 48	Hrs 5 Mi 48

Casualties to:	46. Railroad Employees	47. Train Passengers	48. Other
Fatal	0	0	0
Nonfatal	N/A	0	0

49. EOT Device? 1. Yes 2. No: 1

50. Was EOT Device Properly Armed? 1. Yes 2. No: 1

51. Caboose Occupied by Crew? 1. Yes 2. No: N/A

OPERATING TRAIN #2

52. Type of Equipment Consist *(single entry)* 1. Freight train 2. Passenger train 3. Commuter train 4. Work train 5. Single car 6. Cut of cars 7. Yard/switching 8. Light loco(s). 9. Maint./inspect.car A. Spec. MoW Equip.	Code	53. Was Equipment Attended? 1. Yes 2. No	Code	54. Train Number/Symbol
	1	1	1	IMNLB-21

55. Speed *(recorded speed, if available)* R - Recorded E - Estimated			Code
	0	MPH	R

57. Method(s) of Operation *(enter code(s) that apply)*: a. ATCS; b. Auto train control; g. Automatic block; h. Current of traffic; m.Special instructions; n. Other than main track

57a. Remotely Controlled Locomotive? 0 = Not a remotely controlled; 1 = Remote control portable

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56. Trailing Tons *(gross tonnage, excluding power units)*	c. Auto train stop d. Cab e. Traffic f. Interlocking	i. Time table/train orders j.Track warrant control k. Direct traffic control l.Yard limits	o. Positive train control p. Other *(Specify in narrative)* Code(s)	2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter
N/A			e N/A N/A N/A N/A	0

58. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded *(yes/no)*	59. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box.	Alcohol	Drugs
(1) First involved *(derailed, struck, etc)*	DTTB73668	98	yes		N/A	N/A
(2) Causing *(if mechanical cause reported)*	0	N/A	N/A	60. Was this consist transporting passengers? (Y/N)	N/A	

61. Locomotive Units	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End c. Remote
(1) Total in Train	3	0	0	0	0
(2) Total Derailed	0	0	0	0	0

62. Cars	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Equipment Consist	95	0	0	0	0
(2) Total Derailed	4	0	0	0	0

63. Equipment Damage This Consist	64. Track, Signal, Way, & Structure Damage	65. Primary Cause Code	66. Contributing Cause Code
165349	5000	H605	N/A

Number of Crew Members				Length of Time on Duty	
67. Engineer/ Operators	68. Firemen	69. Conductors	70. Brakemen	71. Engineer/Operator	72. Conductor
1	1	1	N/A	Hrs 10 Mi 33	Hrs 10 Mi 33

Casualties to:	73. Railroad Employees	74. Train Passengers	75. Other
Fatal	0	0	0
Nonfatal	1	0	0

76. EOT Device? (1. Yes 2. No)	77. Was EOT Device Properly Armed? (1. Yes 2. No)	78. Caboose Occupied by Crew? (1. Yes 2. No)
1	1	N/A

Highway User Involved

79. Type — Code: N/A
A. Auto B. Truck C. Truck-Trailer. D. Pick-Up Truck E. Van F. Bus G. School Bus H. Motorcycle J. Other Motor Vehicle K. Pedestrian M. Other *(spec. in narrative)*

80. Vehicle Speed *(est. MPH at impact)*: N/A

81. Direction *(geographical)* — Code: N/A
1.North 2.South 3.East 4.West

82. Position — Code: N/A
1.Stalled on Crossing 2.Stopped on Crossing 3.Moving Over Crossing 4. Trapped

86a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

Rail Equipment Involved

83. Equipment — Code: N/A
1.Train *(units pulling)* 2.Train *(units pushing)* 3.Train *(standing)* 4.Car(s) *(moving)* 5.Car(s) *(standing)* 6.Light Loco(s) *(moving)* 7.Light(s) *(standing)* 8.Other *(specify in narrative)*

84. Position of Car Unit in Train: N/A

85. Circumstance — Code: N/A
1. Rail Equipment Struck Highway User
2. Rail Equipment Struck by Highway User

86b. Was there a hazardous materials release by — Code: N/A
1. Highway User 2. Rail Equipment 3. Both 4. Neither

86c. State here the name and quantity of the hazardous materials released, if any.: N/A

87. Type of Crossing Warning — Code(s): N/A N/A N/A N/A N/A N/A N/A
1.Gates 2.Cantilever FLS 3.Standard FLS 4.Wig Wags 5.Hwy. traffic signals 6.Audible 7.Crossbucks 8.Stop signs 9.Watchman 10.Flagged by crew 11.Other *(spec. in narr.)* 12.None

88. Signaled Crossing Warning — Code: N/A
(See instructions for codes)

89. Whistle Ban — Code: N/A
1. Yes 2. No 3. Unknown

90. Location of Warning — Code: N/A
1. Both Sides 2. Side of Vehicle Approach 3. Opposite Side of Vehicle Approach

91. Crossing Warning Interconnected with Highway Signals — Code: N/A
1. Yes 2. No 3. Unknown

92. Crossing Illuminated by Street Lights or Special Lights — Code: N/A
1. Yes 2. No 3. Unknown

93. Driver's Age: N/A

94. Driver's Gender — Code: N/A
1. Male 2. Female

95. Driver Drove Behind or in Front of Train and Struck or was Struck by Second Train — Code: N/A
1. Yes 2. No 3. Unknown

96. Driver — Code: N/A
1. Drove around or thru the Gate 2. Stopped and then Proceeded 3. Did not Stop 4. Stopped on Crossing 5. Other *(specify in narrative)*

97. Driver Passed Standing Highway Vehicle — Code: N/A
1. Yes 2. No 3. Unknown

98. View of Track Obscured by *(primary obstruction)* — Code: N/A
1. Permanent Structure 2. Standing Railroad Equipment 3. Passing Train 4. Topography 5. Vegetation 6. Highway Vehicle 7. Other *(specify in narrative)* 8. Not obstructed

101. Casulties to Highway-Rail Crossing Users	Killed	Injured
	N/A	N/A

99. Driver Was — Code: N/A
1. Killed 2.Injured 3. Uninjured

100. Was Driver in the Vehicle? — Code: N/A
1. Yes 2. No

102. Highway Vehicle Property Damage *(est. dollar damage)*: N/A

103. Total Number of Highway-Rail Crossing Users *(include driver)*: N/A

104. Locomotive Auxiliary Lights? — Code: N/A
1. Yes 2. No

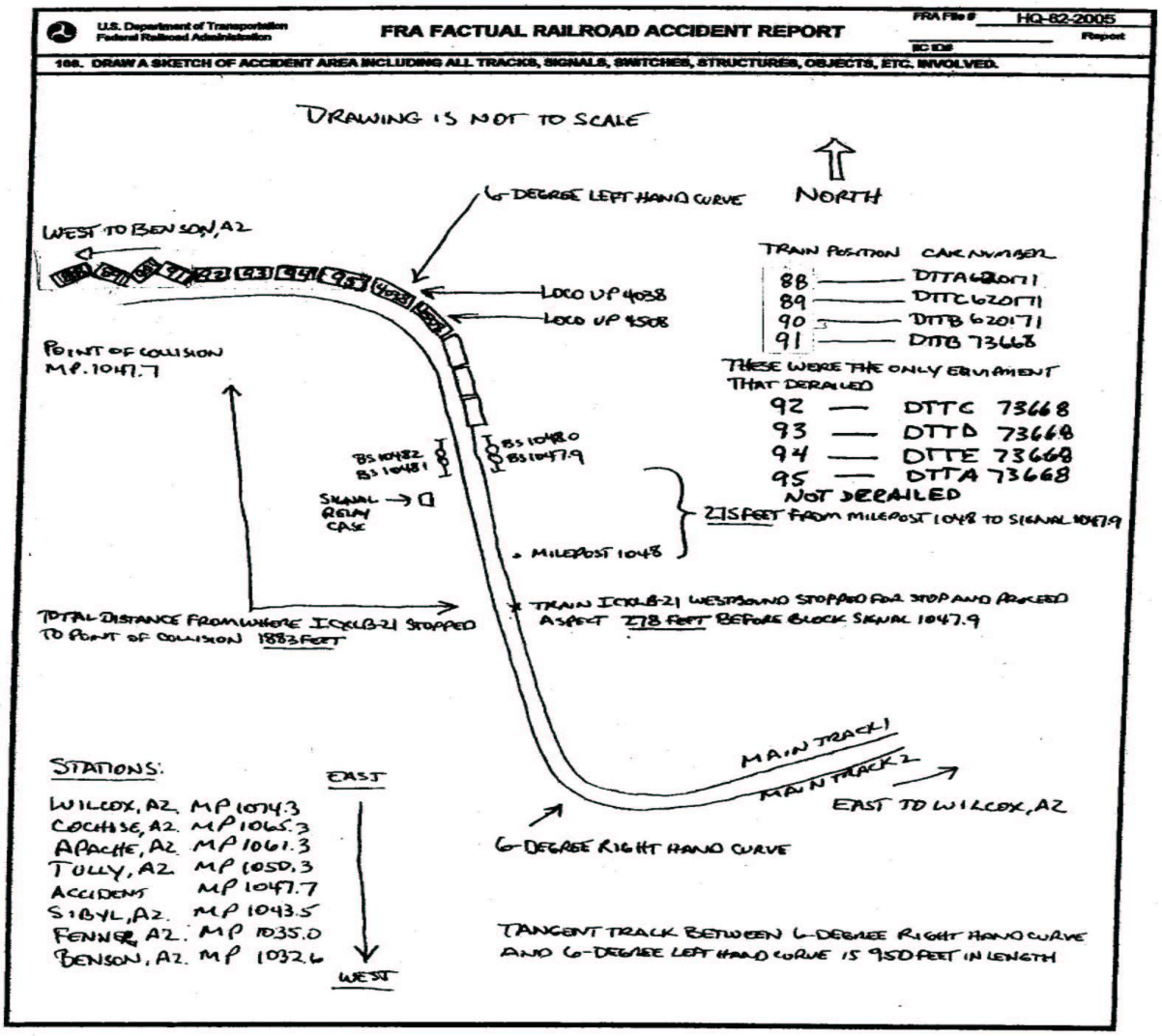
105. Locomotive Auxiliary Lights Operational? — Code: N/A
1. Yes 2. No

106. Locomotive Headlight Illuminated? — Code: N/A
1. Yes 2. No

107. Locomotive Audible Warning Sounded? — Code: N/A
1. Yes 2. No

108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED.

HQ-82-2005.jpg



109. SYNOPSIS OF THE ACCIDENT

The accident was a rear end collision between two westbound Union Pacific Railroad trains that occurred on September 25, 2005, at approximately 12:48 a.m., Mountain Daylight Time. The point of derailment was at MP 1047.7, on Main Track No. 1, located on the Lordsburg Subdivision of the Tucson Service Unit. The Tucson Service Unit is part of UP's Sunset Area Timetable dated March 7, 2004. Both trains were made up of articulated and conventional inter-modal type freight equipment. In the state of Arizona, Union Pacific observes the Mountain Daylight Time Zone. At the time of the accident it was clear and dark with an ambient temperature of 70 degrees.

The rear end collision caused four well platforms of articulated and conventional equipment to derail. Four well platforms of the 88th through 91st rear platforms (one three platform articulated car and one platform of the following car) to derail on stopped train IMNLB-2 (Train 2). No other equipment derailed. Estimated damages were $167,366.00 for equipment, $5,000.00 in track damage and no signal damage. No hazardous materials were spilled nor was there a release of such materials.
The conductor of stopped Train 2 was injured in the collision. He was taken to a hospital where he was treated and released after x-rays were taken, he received an injection and was given a prescription for muscular pain relief in his lower back. No other injuries were reported.
The accident occurred approximately 16 miles east of Benson, Arizona where there are a series of left hand and right hand curves which range between 4 and 7 degrees. In this area, the grade is descending westward at between 0.7 and 1.0 percent.
Probable cause was failure to observe and comply with restricted speed. As a contributing factor the crew of Train 1 failed to observe and comply with instructions of "Cab Red Zone" (CRZ) as defined by UP System Special Instructions dated April 3, 2005, Item 10-A, C.

110. NARRATIVE

From the east, approaching the accident site, there is a 6-degree right hand curve, followed by a tangent segment approximately 950 feet long, and a left hand 6-degree curve. Signal 1047.9 is located at Milepost 1047.9 approximately 200 feet west of Milepost 1048 on the tangent track between the two 6-degree curves. The point of collision occurred at a point near the west end of the left-hand curve on a descending 0.75 degree grade. The distance from Signal 1047.9 in a westward direction to the point of collision is approximately 1605 feet.

THE ACCIDENT:
Train 1 proceeded westbound following Train 2. The conductor was seated on the left hand side of the cab in the conductor's seat. The engineer was seated at the controls of the locomotive on the right hand side of the cab. The crew of the train observed a Stop and Proceed signal aspect (GCOR Rule 9.2.14) displayed at block signal 1047.9 on Main track 1. The engineer brought the train to a stop 275 feet east of the bock signal. After stopping, the crew made a decision to proceed further west to determine what was taking place ahead of their train and traveled westbound an additional 1883 feet. At 12:48 a.m., Train 1 struck standing Train 2 at a recorded speed of 19 mph at MP 1047.7, on main track No.1. The first car struck was DTTA 73668, a five platform articulate well car. The collision caused platform DTTB 73668 and all three platforms of a three platform articulated well car, DTTA 620171 to derail (A-C-B platforms). The articulated well cars were the 88th through 91st rear platforms. No cars or locomotives of Train 1 derailed. No hazardous materials cars were derailed and no evacuation was necessary.
Shortly after impact, an Eastbound train was approaching the location of the head end of Train 2.
The crew of Train 2 contacted the Eastbound train and advised what had taken place and to pass their train at restricted speed looking out for equipment fouling Main track 2. At about the same time, the crew of Train 1 advised the crew of Train 2 that their train had just stuck the rear car of Train 2. The Crews of both trains notified the train dispatcher of the accident.

The conductor of Train 2 was injured when the train lunged forward after being struck. The conductor felt his lower back stiffen up after he realized what had taken place. As he walked to the rear of his train to make a

determination of damages, his back began to hurt. After making an assessment of damages and securing hand brakes on the train, the conductor reported his lower back began to hurt and asked to be taken to a hospital. A UP officer then drove the conductor to a location where a company provided van could be reached. He was then transported to Northwest Medical Center Hospital in Tucson. At the hospital the conductor had x -rays taken, was given an injection of Toradal, and a prescription for Lodine, medications to relieve pain.
The conductor of Train 1 admitted to reading a book during the Cab Red Zone that was called for as the train was presumably proceeding at restricted speed. The engineer of Train 1stated he was distracted while operating the train after making the stop at block signal 1047.9. He stated he was preoccupied with determining what speed the train was traveling, by looking down at the ground. He said he was trying to determine if the speed indicator was operating properly.
Main track 1 was restored to service on September 26, 2005 at 2:00 p.m.
The conductor and engineer of Train 1 were taken for Post-Accident Toxicological testing at a medical facility and the results were negative for both employees.
UP removed the speed indicator, model 18092, from locomotive UP 4038, Train 1 and shipped it to Wabtec, an independent contract laboratory, to be analyzed for accuracy. One speed indicator was removed from the locomotive engineer's side and one from the conductor's side of the locomotive. The results of testing for serial number 0285250, on the ½ scale, the unit is high by 1 mile, full scale it is low by 2 miles. Wabtec recommends that particular unit needs calibration. The results of testing for serial number 0318696, on the ½ scale, the unit is high by 2 miles, full scale the unit is on the mark at 82.5. All measurements were within FRA compliance limits.

ANALYSIS AND CONCLUSIONS:
The event recorder from locomotive UP 4038 was downloaded as soon as practicable following the collision. The download revealed Train 1 was traveling at a speed of 19 MPH when it struck the rear car of Train 2. It also revealed the engineer, despite the fact the train was on between a 0.7% and 1% descending grade, operated up to throttle position 3, to move the train from a stop. After bringing the throttle back to idle and going into dynamic braking, the engineer then made a 6 pound brake pipe reduction on the automatic brake valve, which was rapidly followed by an emergency application of the train brakes. Additionally, the engineer made a 30 pound application on the independent brake valve. The engineer then fully released the independent brake, as the application of the independent brake would nullify the retarding force of the dynamic brakes.
Testimony from the company held investigation revealed the engineer did not comply with restricted speed and neither the conductor nor the engineer was in compliance with the requirements of a Cab Red Zone (CRZ) situation.
In addition, UP and FRA interviews with both the conductor and the engineer noted similar results, in that, a failure to comply with restricted speed as well as the requirements of CRZ was evident.
Work histories for both the conductor and the engineer of Train 1 noted both had sufficient off-duty periods prior to reporting for duty on September 24, 2005.
The locomotive engineer of Train 1 had just recently returned to service following a major rules infraction. The engineer was out of service following a STOP signal violation at CP 988 in Tucson, Arizona on July 1, 2005. The engineer was operating train ZMQLA-30 and was unable to stop his train before passing the signal displaying STOP. He was removed from service and de-certified for 30 days. Following his return to service the engineer was set back to student engineer status and was required to complete remedial training. He was required to make four trips with a certified locomotive engineer while in student status and was also required to pass a monitored simulator trip.
The engineer did complete remedial training with a passing grade and was return to active duty.
A review of UP operational testing records for the conductor of Train 1 did not reveal any red block test failures prior to this accident.
At FRA's request, the speed indicator was shipped to an independent contract laboratory to determine the accuracy of the device. Results indicate one of the speed indicators needed to be recalibrated however they both were within FRA compliance limits.
PROBABLE CAUSE AND CONTRIBUTING FACTORS:
Probable cause was failure to observe and comply with restricted speed. As a contributing factor the crew of Train 1 failed to observe and comply with instructions of "Cab Red Zone" (CRZ) as defined by UP System Special Instructions dated April 3, 2005, Item 10-A, C-1. The FRA concurs with these findings.
Examination of the speed indicator determined it was not a casual factor.
APPLICABLE RULES
Restricted speed as defined by GCOR rule 6.27 reads in part: When required to move at restricted speed, movement must be made at a speed that allows stopping within half the range of vision short of: train, engine, railroad car, men or equipment fouling the track, Stop signal or derail or switch not properly lined. When a train

or engine is required to move at restricted speed, the crew must keep a lookout for broken rail and not exceed 20 mph.

Cab Red Zone instructions require crews to act responsibly when operating at restricted speed. The instructions read in part: During “CRZ” an environment must be created in the control compartment that focuses exclusively on controlling the train and complying with the rules.

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