



***Federal Railroad Administration
Office of Railroad Safety***

***Accident Investigation Report
HQ-2021-1473***

***KCS Derailment
Vicksburg, MS
December 21, 2021***

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, 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.

**FEDERAL RAILROAD ADMINISTRATION
BASIC ACCIDENT INVESTIGATION**

FRA File Number

HQ-2021-1473

1. Primary Railroad Kansas City Southern Railway Co.			1a. Alphabetic Code KCS	1b. Class Class I		1c. Railroad Accident Number 21122101	
2. Other Railroad/Entity Involved			2a. Alphabetic Code	2b. Class Select:		2c. Railroad Accident Number	
3. Railroad/Entity Responsible for Track Maintenance Kansas City Southern Railway Co.			3a. Alphabetic Code KCS	3b. Class Class I		3c. Railroad Accident Number 21122101	
4. Date and Time of Accident (local) 12/21/2021 19:18		6. Division/Operating Unit SE			6a. Subdivision Meridian		
7. State (Abbr.) MS	8. County Warren		9. City/Town (closest) Vicksburg		10. Latitude/Longitude 32.34642, -90.75197		
11. Milepost 129.9	12. Track Name/Number Main		13. Track Type Main	14. FRA Track Class 4		15. Timetable Direction East	
16. Signalization Signaled		16a. Method of Operation Direct Train Control		16b. Supplemental Codes (Select up to 5) Q Select: Select: Select: Select:			
17. Accident Type Other (description included)		18. Equipment Damage \$699,422.00		19. Track/Signal/Structure Damage \$474,288.00		20. Total Damage \$1,173,710.00	
21. Temperature (degrees Fahrenheit) 68		22. Visibility Dark		23. Weather Clear		23a. Warnings/Advisories None	
23b. Weather Related Conditions None		24. Type of Equipment Freight Train			25. Train Symbol M-SHAR-21		
26. Trailing Tons 6,246	27. Train Length 4,384	28. Empty	29. Attended Yes	30. Remote No	31. Speed (mph) 38	31a. Estimated/Recorded Estimated Speed	
32. Total Locomotives in Accident 3	32a. Head-end Locomotives 2	32b. Mid-Train Locomotives 0	32c. Mid-Train Locomotive Position			32d. Rear-end Locomotives 1	
32e. Total Locomotives Derailed 0	32f. Head-end Derailed 0	32g. Mid-Train Derailed 0	32h. Mid-Train Derailment Position			32i. Rear-end Derailed 0	
33. Configuration Distributed Power - Single Block of DP Locomotives on Rear of Train							
33a. Locomotive Control Locomotive not equipped with Locomotive Control							
33b. PTC Information PTC Active and in Use							
34. Total Cars in Accident 72	34a. Loaded Freight 40	34b. Loaded Passenger 0	34c. Empty Freight 32	34d. Empty Passenger 0	34e. Unoccupied Caboose/ Shoving Platform 0	34f. Occupied Caboose/ Shoving Platform 0	
35. Total Cars in Derail 19	35a. Loaded Freight 40	35b. Loaded Passenger 0	35c. Empty Freight 32	35d. Empty Passenger 0	35e. Unoccupied Caboose/ Shoving Platform 0	35f. Occupied Caboose/ Shoving Platform 0	
36a. HAZMAT in Train 22	36b. HAZMAT Derailed 11	36c. HAZMAT Releasing 2	36d. Evacuation No	36e. People 0	37. Point of Derailment 131.1	38. Mechanism of Derailment Catastrophic Failure	
39. First Equipment Derailed SRAX 25123	39a. Load/Empty Load	40. Empty	41. Weight (tons) 178,600	42. AAR Car Type T907	43. Leading End B	44. First Wheel Derailed L2	
45a. Employee 1 Craft 608	45b. Injured Not Injured	45c. Time on Duty 12/21/2021 09:35	45d. Regular Assignment Yes	45e. Drug & Alcohol Tested No	45f. In cab @ time of Accident Yes		
46a. Employee 2 Craft 617	46b. Injured Not Injured	46c. Time on Duty 12/21/2021 09:35	46d. Regular Assignment Yes	46e. Drug & Alcohol Tested No	46f. In cab @ time of Accident Yes		
47a. Employee 3 Craft Select:	47b. Injured Select:	47c. Time on Duty	47d. Regular Assignment Select:	47e. Drug & Alcohol Tested Select:	47f. In cab @ time of Accident Select:		
48a. Employee 4 Craft Select:	48b. Injured Select:	48c. Time on Duty	48d. Regular Assignment Select:	48e. Drug & Alcohol Tested Select:	48f. In cab @ time of Accident Select:		
49a. Employee 5 Craft Select:	49b. Injured Select:	49c. Time on Duty	49d. Regular Assignment Select:	49e. Drug & Alcohol Tested Select:	49f. In cab @ time of Accident Select:		
50a. Contractors	50b. Injured Select:	50c. Time on Duty	50d. In cab @ time of accident Select:	50e. Empty			
51a. Trespassers	51b. Injured Select:	51c. In cab @ time of accident Select:	52a. Others		52b. Injured Select:	52c. In cab @ time of accident Select:	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating Practices	Track	MP&E	Signal	Grade Crossing	Drug & Alcohol	Fatigue	HazMat
The pages will appear in the order selected, you can select as many as you need.							

FEDERAL RAILROAD ADMINISTRATION
BASIC ACCIDENT INVESTIGATION

FRA File Number

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53. Executive Summary and FRA Investigation Findings:

On December 21, 2021, at approximately 7:18 p.m., CST, eastbound Kansas City Southern Railroad Company (KCS) Train M-SHAR-21 (Train 1) derailed in the Bovina community of Vicksburg, Mississippi. The derailment occurred on KCS's Meridian Subdivision on single main track at Milepost (MP) 129.9, approximately 9 miles east of the Mississippi River. The train was operating on signaled, signal indication, Centralized Traffic Control (CTC) territory. Weather conditions were 68° F with low visibility (dark) and clear skies.

Train 1 is a mixed freight train that originated out of Shreveport, Louisiana, destined for Jackson, Mississippi. The train received a Title 49 Code of Federal Regulations (CFR) Section 232.205 Class I brake test-initial terminal inspection and a Section 215.13 pre-departure inspection prior to train departure. The train crew consisted of a locomotive engineer and conductor. Both crew members' tour of duty started on December 21, 2021, at 9:35 a.m., following statutory off-duty rest. The crew was away from their home terminal during the time of the incident. The train consisted of 3 locomotives (2 on the head end and 1 rear DP unit) and 72 freight cars (40 loads and 32 empties). The train was 4,384 feet long with 6,246 trailing tons.

According to the train crew, prior to the derailment, operations were normal as they performed their duties from the cab of the lead locomotive. The engineer reported that while traveling eastbound near MP 129.5 on the Meridian Subdivision, he noticed a yellow "DP" information flag appear on his control screen for about 4 to 5 seconds before disappearing off the screen. After about 2 to 3 seconds, he felt a "tug" sensation from the rear of the train, and then the train experienced an undesired emergency brake application. After an unsuccessful attempt to recover the train's air brakes, the conductor proceeded to walk towards the rear of the train and realized that the train had derailed. According to the KCS System Timetable, the maximum train speed on the Meridian Subdivision is 59 mph. Both prior to and during the time of the incident, the train was traveling at an estimated speed of 38 mph.

The point of derailment (POD) was determined to be located at MP 131.1. There was a total of 19 freight cars (17 loads and 2 empties) that derailed, with 11 of them being hazardous material cars.

During the investigation, it was determined that the root cause of the derailment was a cracked wheel hub at the L2 location on the "B" end of freight car SRAX 25123. According to the train manifest, freight car SRAX 25123 was in position 34 of the train consist. A review of the Hot Wheel Detector records along the train's route did not reveal any signs of heat elevation at any of the wheel locations on freight car SRAX 25123. A review of the car repair history for the previous year from the date of the incident did not disclose any discrepancies.

Total damage for the accident was estimated at \$1,173,710, with equipment damage at \$699,422, and track, signal, and structures at \$474,288.

On Tuesday, December 21, 2021, at approximately 11 p.m., the Federal Railroad Administration (FRA) began an investigation of the derailment in conjunction with KCS railroad personnel. The FRA assigned MP&E and Track inspectors to the accident investigation.

During the investigation, FRA investigators inspected the accident site and freight equipment involved in the derailment.

After an on-site inspection and investigation, FRA's investigators also requested and received all records, forms, and other documentation necessary to conduct their final analysis and draw conclusions concerning the pertinent facts of the derailment. The following analysis and conclusions, as well as any possible contributing factors and the probable cause in this report, represent the findings of FRA's investigation.

The probable cause of the accident was a broken wheel on freight car SRAX 25123, which resulted from a crack in the L2 wheel hub.

FRA determined that KCS was in compliance with its own standards.

FRA determined the probable cause of the accident is cause code E62C – Broken plate.

Click here if you need additional room for Executive Summary and FRA Investigation Findings

Click Here to add Sign Page after ALL Discipline and Summary pages have been added

56. MP&E Analysis:

Analysis – Freight Car SRAX 25123: FRA inspected the equipment involved in the derailment with a focus on freight car SRAX 25123 and reviewed the car repair history. The subject freight car received a pre-departure inspection in accordance with Title 49 CFR § 215.13. No wheel defects were noted at that time.

Conclusion – The most recent repairs made to the subject car occurred on February 26, 2021. The repairs performed did not contribute to the derailment.

Analysis - Hot Wheel Detector Report: FRA obtained the hot wheel detector report for freight car SRAX 25123. The subject freight car traversed 11 hot wheel detectors prior to the derailment. Review of the temperature data revealed no abnormal temperature readings that would have alerted the railroad to perform an inspection of the subject freight car. When a detector receives a temperature reading of 170 ° F or above, an alert is sent to the train crew. The subject car showed an average temperature of 26.54 ° F at the L2 location.

Conclusion – The hot wheel detectors would not have alerted the crew that any abnormal temperatures existed prior to the derailment.

Analysis – Wheel Impact Load Detector Report: FRA obtained a copy of the wheel impact load detector report. The detector is located approximately 30 minutes east of Shreveport at MP 151.8. Review of the data showed no abnormal readings that would have alerted the railroad to any existing wheel defects.

Conclusion – At the time the freight car SRAX 25123 reached the wheel impact load detector, no readings were recorded that would have suggested any significant wheel defects existed.

Overall Conclusions – The probable cause of the derailment is a broken wheel at the L2 position of freight car SARX 25123.

To prevent accidents of this nature from occurring in the future, the FRA should continue to perform routine inspections of freight cars with an emphasis on wheel defects.

56a. Evidence Collected

Hours of Service Record
Train Consist – Work Order
KCS System Timetable
KCS Form 4751 – Conductor/Engineer Report
Air Brake Inspection Record
Screen Shot of Locomotive Download (KCS 4003)
Crew Statement
Conductor Report of Interview
.97 Report – Initial Rail Equipment Accident/Incident Record
84E Report – Managers Report
66E Report – Equipment Report
54 Report – Rail Equipment Accident/Incident Report



62. Primary Cause Code E62C	63. Contributing Cause Code 1	64. Contributing Cause Code 2 Select:
65. Contributing Cause Code 3 Select:	66. Contributing Cause Code 4 Select:	67. Contributing Cause Code 5 Select:
68. Non-Compliance	69. Enforcement Recommended No	70. Mitigation Recommended No
71. Relevant Waiver No	72. Waiver Number(s)	73. NRC Report Number 1,325,057

Not to scale



Old U.S. 80

Old U.S. 80

Old U.S. 80

Old U.S. 80



Broke Wheel "L2"
(SRAX 25123)



Wildlife Co-Op



Bovina Baptist Church

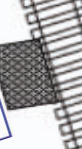
302371V



302372C



302373J



302374R

ABS 16012



ONLX 712154



MP 131.1 (POD)

UTLX 630244

TILX 160747

TCLX 163084

- SRAX 25123 "B" end
- GATX 90256
- GATX 416
- WFRX 838590
- UTCX 59093
- MBKX 175286
- RGCX 38246
- TILX 160218
- UTLX 630130
- GATX 32328
- OMNX 102029
- OMNX 102038
- MBLX 53565
- TFM 71023

MP 130

Bovina Dr

Tiffencorn Rd

Fentown Rd