

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

Railroad Accident Brief Report

LAX 96 FR 010

DERAILMENT AND HAZARDOUS MATERIALS RELEASE WITH FATALITY
MONTANA RAIL LINK
ALBERTON, MONTANA
APRIL 11, 1996

About 4:10 a.m., mountain daylight time, on April 11, 1996, 19 cars from Montana Rail Link (MRL) freight train 01-196-10 derailed near Alberton, Montana. Six of the derailed cars contained hazardous materials. One derailed tank car containing chlorine (a poison gas) ruptured, releasing 130,000 pounds of chlorine into the atmosphere; another tank car containing potassium hydroxide solution (potassium cresylate, a corrosive liquid) lost 17,000 gallons of product; and a covered hopper car containing sodium chlorate (an oxidizer) spilled 85 dry gallons onto the ground.

About 1,000 people from the surrounding area were evacuated. Approximately 350 people were treated for chlorine inhalation, 123 of whom sustained injury. Nine people, including both members of the train crew, were hospitalized. A transient riding the train died from acute chlorine toxicity.

U.S. Interstate Highway 90 (I-90) is roughly parallel and about 150 yards north of the MRL tracks at the accident site. The hazardous material cloud drifted across I-90 resulting in multiple highway traffic accidents. Several motorists were stranded in the cloud after these accidents. I-90 was closed following the accident requiring an 81-mile detour. Monetary damage was estimated to be \$3.9 million.

The Governor of Montana declared a state of emergency in Missoula and Mineral County. On April 14, 1996 the evacuation area was reduced to 15 square miles; the residents were temporarily escorted into the area to feed and water livestock animals, retrieve some personal possessions, and locate pets.

Chlorine from the derailed but nonruptured tank cars was transloaded at the accident site. The operation began on April 14th and was concluded on April 28th. When the transloading was completed the evacuation was canceled, residents were allowed to return to their homes, and I-90 was reopened.

The MRL train consisted of 3 locomotive units, 36 loaded and 35 empty freight cars. Twenty-five of the loaded cars contained placarded hazardous

materials. It was traveling 40 mph just before the derailment when both train crew members reported they felt the locomotive “dip to the left” and then come back upright. The crew commented about the rough track and a few seconds later the train brakes applied in emergency. When they looked back toward the train they said they could see sparks flying and believed the train had derailed.

About 514 feet of rail was dislocated in the derailment. Approximately 444 feet of that total were recovered. Rail sections believed to have been located on the outside of the curve at the point of derailment exhibited gage and head wear. Additionally, a portion of rail recovered from the accident site displayed evidence of a vertical split head. Rail sections were sent to a laboratory for metallurgical analysis. The laboratory concluded that the “...level of wear rendered the rail susceptible to fracture due to its diminished load bearing capacity,” and “these rail fragments failed in a vertical split head mode with subsequent vertical propagation to the surfaces in a progressive and rapid manner. Final separation into the examined fragments next occurred during the derailment by rapid cleavage overload along multiple transverse planes.”

Metallurgical analysis taken together with the wreckage dispersal pattern, and the train crew’s statements revealed that a rail broke under the moving train and that the failure mode was a vertical split head.

The visual rail inspection records did not indicate rail problems in this area. An ultrasonic rail inspection vehicle traversed this area on March 1, 1996. No defects were detected at the location of the vertical split head. The rail was extensively covered with rail head checks (shelling) and other surface defects throughout its length. Ultrasonic rail defect detection equipment is unable to identify internal rail defects when rail surface defects are present in the same location.

PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was a rail section that fractured in vertical split head mode under the passing train induced by rail with reduced load bearing capacity because of head and gage face wear. Contributing to the cause of the accident was the inability of the ultrasonic rail defect detection equipment to readily identify internal defects in rail with surface defects.

Adopted: August 18, 1998