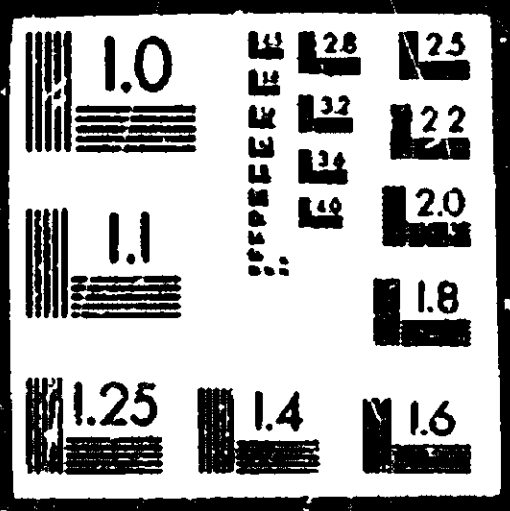
2 OF 2

PB 91
917 002



File No. - 73 | 07/22/88 | FARNUM, NE | Time (Lcl) - 1645 CDT

Occurrence #1 - COLLISION, SIDE
Phase - MAINTAINING SPEED

Finding(s)
1. EXTRA TRAIN - STRUCK
2. VEHICLE HANDLING - IMPROPER - MOTOR VEHICLE/MOTOR CAR OPERATOR
3. INATTENTIVE - DRIVER OF VEHICLE

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 2, 3

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

APPENDIX D

NTSB # FTW88FRZ24 — BRIEF OF ACCIDENT — RUNDATE: 03/23/90

File No. - 75 — 07/24/88 — WHITE BLUFF, TN — Time (Lcl) - 1030 CDT

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 1,753,856.00
Non-Railroad - $ 20,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CSX - CSX TRANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 2651 EAST
Direction - EAST
Speed (Est.) - 35
Speed (Auth.) - 50

Train Consist/Damage
No. Loco. Units - 5
No. Cars/Caboose - 150/1
End of Train Monitor - NO
Length (Feet) - 10191
Trailing Tons - 10549
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 32/34

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
BREWSTER, TN

Destination
NASHVILLE, TN

Hazardous Materials
Involved - YES
Cars Involved - 5

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 1.50
Alignment - CURVE 3 D 0 M

---Narrative---
CSX FREIGHT TRAIN EXTRA 2651 EAST HAD 34 CARS DERAIL WHILE TRAVELING 35 MPH DOWN A GRADE THAT HAD REVERSE AND COMPOUND CURVES. A DERAILED TANK CAR WAS BREACHED AND RELEASED 20,000 GALLONS OF PETROLEUM SULFITE WASTE. ONE FAMILY WAS EVACUATED OVERNIGHT. THE TANK CAR WAS NOT LISTED ON THE TRAIN CONSIST AS A HAZMAT CAR. THE ENGINEER'S USE OF THE TRAIN BRAKES AND TRAIN SPEED WERE NOT CONSISTENT WITH GOOD TRAIN HANDLING TECHNIQUES. HEAVILY LOADED CARS WERE ON THE REAR PORTION OF THE TRAIN. TOXICOLOGICAL TESTS OF THE CREW ABOUT 8 HOURS AFTER THE ACCIDENT RESULTED IN THE CONDUCTOR TESTING POSITIVE FOR MARIJUANA METABOLITE IN THE FOLLOWING CONCENTRATIONS: BLOOD, 24 NG/ML; AND URINE, 71 NG/ML.

File No. - 75 | 07/24/88 | WHITE BLUFF, TN | Time (Lcl) - 1030 CDT

Occurrence #1 - DERAILMENT
Phase - SLOWING

Finding(s)
1. TRAIN HANDLING - POOR - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
2. INADEQUATE SUPERVISION - ROAD FREIGHT CONDUCTOR (through freight)
3. TRAIN MAKEUP - INADEQUATE - CHIEF TRAIN DISPATCHER
4. INSUFFICIENT STANDARDS/REQUIREMENTS - FRA
5. USE OF DRUGS - ROAD FREIGHT CONDUCTOR (through freight)

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1

Factor(s) relating to this accident is/are finding(s) 2, 3

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APPENDIX D

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # DCA88MR706B — BRIEF OF ACCIDENT — RUNDATE: 12/19/90

File No. - 77 — 07/30/88 — ALTOONA, IA — Time (lcl) - 1140 CDT

---Basic Information---

Reporting Railroad - IAIS
Type of Accident - COLLISION, HEAD-ON
Operating Phase - EN ROUTE
Method of Operation - YARD RULES
TIMETABLE

Property Losses
Railroad $ 500,000.00
Non-Railroad - $ 0.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	2	0	0	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	2	1500

IAIS - IOWA INTERSTATE RAILROAD

---Railroad/Personnel Information---

Train Data
Railroad - IAIS
Type of Train - FREIGHT
Train ID - EXTRA 470 WEST
Direction - WEST
Speed (Est.) -
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 1
No. Cars/Caboose - 7/0
End of Train Monitor - MARKER
Length (Feet) - 400
Trailing Tons - 700
Loco. Destroy/Derailed - 1/1
Cars Destroy/Derailed - 0/3

Crew Information
Front End - 2
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - N/A

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IAIS - IOWA INTERSTATE RAILROAD

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
NEWTON, IA

Destination
DES MOINES, IA

Hazardous Materials
Involved - YES
Cars Involved - 2

Track Information
Type/No. of Tracks - MAIN/1
Gradient - ASC. 0.85
Alignment CURVE 1 D 0 M

---Narrative---
IAIS FREIGHT TRAIN EXTRA 406 EAST AND IAIS FREIGHT TRAIN EXTRA 470 WEST COLLIDED HEAD-ON WITHIN YARD LIMITS. ALL 5 LOCOMOTIVE UNITS FROM BOTH TRAINS; 11 CARS OF EXTRA 406 EAST; AND 3 CARS, INCLUDING 2 TANK CARS CONTAINING DENATURED ALCOHOL, OF EXTRA 470 WEST DERAILED. THE DENATURED ALCOHOL, WHICH WAS RELEASED THROUGH THE PRESSURE RELIEF VALVES AND THE MANWAY DOMES OF THE 2 DERAILED TANK CARS, WAS IGNITED BY THE FIRE RESULTING FROM THE COLLISION. BOTH CREWMEMBERS OF 470 WERE FATALLY INJURED; THE 2 CREWMEMBERS OF 406 HAD MINOR INJURIES. THE CREW OF 406 HAD NOT COMPLIED WITH THE WAIT PROVISIONS OF A TRAIN ORDER AND LEFT THE YARD BEFORE 470 ARRIVED. A COMBINATION OF FATIGUE, INEXPERIENCE, AND OTHER FACTORS CONTRIBUTED TO THE ACCIDENT. THE FRA HAD INADEQUATE SURVEILLANCE AND ENFORCEMENT OF THE IAIS. FOR A MORE DETAILED DESCRIPTION, SEE ACCIDENT REPORT NTSB/RAR-89/04.

File No. - 77 | 07/30/88 | ALTOONA, IA | Time (Lcl) - 1140 CDT

Occurrence #1 - COLLISION, HEAD-ON
Phase - SLOWING

Finding(s)
1. OPERATING RULES - NOT COMPLIED - CREW MEMBER OF OTHER TRAIN
2. INADEQUATE SUPERVISION - EXECUTIVES AND OFFICIALS
3. FATIGUE (work schedule) - CREW MEMBER OF OTHER TRAIN
4. SELF-INDUCED PRESSURE - CREW MEMBER OF OTHER TRAIN
5. LACK OF TOTAL EXPERIENCE IN TYPE OF OPERATION - CREW MEMBER OF OTHER TRAIN
6. HABIT INTERFERENCE - CREW MEMBER OF OTHER TRAIN
7. EXPECTANCY - CREW MEMBER OF OTHER TRAIN
8. INADEQUATE TRAINING - EXECUTIVES AND OFFICIALS
9. INADEQUATE SURVEILLANCE OF OPERATION - FRA

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
10. SAFETY RELIEF VALVES - RELEASED
11. MANWAY - RELEASED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

Factor(s) relating to this accident is/are finding(s) 3, 4, 5, 6, 7, 8, 9, 10, 11

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # DCA88MR/06A — BRIEF OF ACCIDENT — RUNDATE: 12/19/90

File No. - 77 — 07/30/88 — ALTOONA, IA — Time (Lcl) - 1140 CDT

---Basic Information---

Reporting Railroad - IAIS
Type of Accident - COLLISION, HEAD-ON
Operating Phase - EN ROUTE
Method of Operation - YARD RULES
TIMETABLE

Property Losses
Railroad - $ 682,000.00
Non-Railroad - $ 0.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	2	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	2	0	0	1500

IAIS - IOWA INTERSTATE RAILROAD

---Railroad/Personnel Information---

Train Data
Railroad - IAIS
Type of Train - FREIGHT
Train ID - EXTRA 406 EAST
Direction - EAST
Speed (Est.) - 15
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 67/0
End of Train Monitor - MONITOR
Length (Feet) - 4000
Trailing Tons - 7000
Loco. Destroy/Derailed - 1/4
Cars Destroy/Derailed - 0/11

Crew Information
Front End - 2
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

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IAIS - IOWA INTERSTATE RAILROAD

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
COUNCIL BLUFFS, IA

Destination
NEWTON, IA

Hazardous Materials
Involved - NO
Cars Involved - 0

Track Information
Type/No. of Tracks - MAIN/1
Gradient - ASC. 0.85
Alignment - CURVE I D O M

---Narrative---
IAIS FREIGHT TRAIN EXTRA 406 EAST AND IAIS FREIGHT TRAIN EXTRA 470 WEST COLLIDED HEAD-ON WITHIN YARD LIMITS. ALL 5 LOCOMOTIVE UNITS FROM BOTH TRAINS; 11 CARS OF EXTRA 406 EAST; AND 3 CARS, INCLUDING 2 TANK CARS CONTAINING DENATURED ALCOHOL, OF EXTRA 470 WEST DERAILED. THE DENATURED ALCOHOL, WHICH WAS RELEASED THROUGH THE PRESSURE RELIEF VALVES AND THE MANWAY DOMES OF THE 2 DERAILED TANK CARS, WAS IGNITED BY THE FIRE RESULTING FROM THE COLLISION. BOTH CREWMEMBERS OF 470 WERE FATALLY INJURED; THE 2 CREWMEMBERS OF 406 HAD MINOR INJURIES. THE CREW OF 406 HAD NOT COMPLIED WITH THE WAIT PROVISIONS OF A TRAIN ORDER AND LEFT THE YARD BEFORE 470 ARRIVED. A COMBINATION OF FATIGUE, INEXPERIENCE, AND OTHER FACTORS CONTRIBUTED TO THE ACCIDENT. THE FRA HAD INADEQUATE SURVEILLANCE AND ENFORCEMENT OF THE IAIS. FOR A MORE DETAILED DESCRIPTION, SEE ACCIDENT REPORT NTSB/RAR-89/04.

File No. - 77 | 07/30/88 | ALTOONA, IA | Time (Lcl) - 1140 CDT

Occurrence #1 - COLLISION, HEAD-ON
Phase - SLOWING

Finding(s)
1. OPERATING RULES - NOT COMPLIED - ENTIRE TRAIN CREW
2. INADEQUATE SUPERVISION - EXECUTIVES AND OFFICIALS
3. FATIGUE (work schedule) - ENTIRE TRAIN CREW
4. SELF-INDUCED PRESSURE - ENTIRE TRAIN CREW
5. LACK OF TOTAL EXPERIENCE IN TYPE OF OPERATION - ENTIRE TRAIN CREW
6. HABIT INTERFERENCE - ENTIRE TRAIN CREW
7. EXPECTANCY - ENTIRE TRAIN CREW
8. INADEQUATE TRAINING - EXECUTIVES AND OFFICIALS
9. INADEQUATE SURVEILLANCE OF OPERATION - FRA

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
10. SAFETY RELIEF VALVES - RELEASED
11. MANWAY - RELEASED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

Factor(s) relating to this accident is/are finding(s) 3, 4, 5, 6, 7, 8, 9, 10, 11

APPENDIX I)

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FTW88FR225 — BRIEF OF ACCIDENT — RUNDATE: 12/21/90

File No. - 78 — 07/30/88 — UMBARGER, TX — Time (Lcl) - 0245 CDT

---Basic Information---

Reporting Railroad - ATSF
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL
TIMETABLE

Property Losses
Railroad - $ 82,100.00
Non-Railroad - $ 0.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	6

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - ATSF
Type of Train - FREIGHT
Train ID - EXTRA 7429 WEST
Direction - WEST
Speed (Est.) - 77
Speed (Auth.) - 70

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 53/0
End of Train Monitor - MONITOR
Length (Feet) - 4800
Trailing Tons - 3690
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 1/0

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
AMARILLO, TX

Destination
CLOVIS, NM

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - MAIN/1
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
ATSF FREIGHT TRAIN EXTRA 7429 WEST STOPPED EN ROUTE DUE TO AN IN-TRAIN FIRE NEAR THE MIDDLE OF THE TRAIN. THE FIRE WAS IN A TRUCK TRAILER VAN LOADED ON A FLAT CAR. THE FIRE BURNED VIOLENTLY FOR A SHORT TIME UNTIL THE ALUMINUM TRUCK TRAILER WAS COMPLETELY CONSUMED AND THE FLAT CAR WAS DESTROYED. A FIRE DEPARTMENT 10 MILES AWAY SAW FIREBALLS IN THE AIR WHILE ON THEIR WAY TO THE SITE. THE TRAILER CARGO CONSISTED OF 105 DRUMS OF POTASSIUM PERMANGANATE, A POWERFUL OXIDIZING AGENT. EACH SINGLE TRIP DRUM HAD A CAPACITY OF 30 GALLONS AND WAS MANUFACTURED FROM 24 GAUGE STEEL TO DOT SPECIFICATION 37A355. THE DRUMS WERE LOADED ON WOODEN PALLETS WITH FOUR DRUMS PER EACH PALLET. THE DESTRUCTION OF THE TRAILER PREVENTED A DETERMINATION OF THE ORIGIN OF THE FIRE. SIX RESIDENTS WERE EVACUATED FROM NEARBY FARM HOUSES FOR ABOUT THREE HOURS. THERE WERE NO INJURIES.

BRIEF OF ACCIDENT, continued

File No. - 78 | 07/30/88 | UMBARGER, TX | Time (Lcl) - 0245 CDT

Occurrence #1 - FIRE
Phase - MAINTAINING SPEED

Finding(s)
1. CARGO - BURNED
2. TRAILER - DESTROYED

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1

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APPENDIX O

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FTW88FR226 — BRIEF OF ACCIDENT — RUNDATE: 03/23/90

File No. - 79 — 08/01/88 — OHIOPYLE, PA — Time (Lcl) - 0315 EDT

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 723,000.00
Non-Railroad - $ 0.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CSX - CSX TRANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 8388 WEST
Direction - WEST
Speed (Est.) - 34
Speed (Auth.) - 40

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 91/0
End of Train Monitor - MONITOR
Length (Feet) - 5300
Trailing Tons - 7746
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 16/19

Crew Information
Front End - 4
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

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CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - FOG
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
CUMBERLAND, MD

Destination
WILLARD, OH

Hazardous Materials
Involved - YES
Cars Involved - 5

Track Information
Type/No. of Tracks - MAIN/2
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
CSX FREIGHT TRAIN EXTRA 8388 WEST HAD 19 CARS DERAIL WHILE MOVING 34 MPH. DERAILED TANK CARS CONTAINED LIQUID CHLORINE, SODIUM HYDROXIDE, AND HYDROCHLORIC ACID, BUT NONE LEAKED OR SPILLED. TWO BOXCARS LOADED WITH PAPER CAUGHT ON FIRE. WHITE-WATER RAFTERS ON THE YOUGHIOGHENY RIVER WERE EVACUATED FROM THE AREA AND HIKING AND BICYCLE TRAILS WERE CLOSED. ONE OF THE BOXCARS OF PAPER HAD AN AXLE JOURNAL THAT OVERHEATED AND BURNED OFF DUE TO A FAILED ROLLER BEARING. A HOTBOX DETECTOR HAD DETECTED THE OVERHEATED JOURNAL ABOUT 24 MILES PRIOR TO THE DERAILMENT SITE AND THE TRAIN WAS STOPPED FOR AN INSPECTION. THE CONDUCTOR WALKED BACK TO CHECK, BUT HE FAILED TO LOCATE THE HOT AXLE BEARING. DUE TO A MISCALCULATION, HE INSPECTED THE AXLES OF THE WRONG CARS. HE ALSO DID NOT INSPECT THE REQUIRED NUMBER OF CARS. AFTER THIS INADEQUATE INSPECTION, THE TRAIN WAS STARTED AND OPERATED UNTIL THE AXLE JOURNAL FAILED AND THE TRAIN DERAILED.

File No. - 79 | 08/01/88 | OHIOPYLE, PA | Time (Lcl) - 0315 EDT

Occurrence #1 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. ROLLER BEARING - OVERHEATED
2. AXLE JOURNAL - BURN-OFF
3. INADEQUATE INSPECTION - ROAD FREIGHT CONDUCTOR (through freight)
4. OPERATING RULES - NOT COMPLIED - ROAD FREIGHT CONDUCTOR (through freight)

Occurrence #2 - DERAILMENT
Phase - ACCELERATING

Occurrence #3 - FIRE
Phase - STOPPING

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 4

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FIW88FR727 — BRIEF OF ACCIDENT — RUNDATE: 12/21/90
File No. - 80 — 08/02/88 — BRAZORIA, TX — Time (lcl) - 2105 CDT

---Basic Information---

Reporting Railroad - UP
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 593,700.00
Non-Railroad - $ 0.00

Fire - YES

Injuries	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	4	66

UP - UNION PACIFIC RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - UP
Type of Train - LOCAL FREIGHT
Train ID - EXTRA 832 NORTH
Direction - NORTH
Speed (Est.) - 38
Speed (Auth.) - 35

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 44/0
End of Train Monitor - MARKER
Length (Feet) - 2721
Trailing Tons - 4966
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 8/13

Crew Information
Front End - 4
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

UP - UNION PACIFIC RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DUSK

Evacuation - YES

Itinerary
Last Departure Point
BAY CITY, TX

Destination
ANGLETON, TX

Hazardous Materials
Involved - YES
Cars Involved - 13

Track Information
Type/No. of Tracks - MAIN/1
Gradient - LEVEL
Alignment - CURVE I D O M

---Narrative---
UP LOCAL FREIGHT TRAIN EXTRA 832 NORTH HAD 13 HAZARDOUS MATERIAL TANK CARS DERAIL WHILE MOVING 38 MPH. FIVE TANK CARS CONTAINING ACETALDEHYDE, A FLAMMABLE LIQUID, WERE RUPTURED AND CAUGHT FIRE. ANOTHER ACETALEHYDE TANK CAR WAS ENGULFED IN FLAMES AND EXPLODED. ABOUT 70 LOCAL RESIDENTS WERE EVACUATED FOR 3 HOURS. FOUR PERSONS ENTERED THE DERAILMENT AREA AND WERE LATER TREATED FOR MINOR EYE AND SKIN IRRITATION. THE INITIAL DERAILMENT OCCURRED WHEN A WHEEL OF A TANK CAR CLIMBED OVER THE OUTSIDE RAIL IN A CURVE. ABOUT 1.3 MILES FARTHER, THE DERAILED WHEELSET STRUCK A FACING POINT SWITCH, STARTING THE GENERAL DERAILMENT OF THE 13 TANK CARS. INVESTIGATION REVEALED IRREGULAR TRACK SURFACE AND CURVE ELEVATION OF THE TRACK IN THE AREA OF THE INITIAL DERAILMENT.

File No. - 80 | 08/02/86 | BRAZORIA, TX | Time (Lcl) - 2105 CDT

Occurrence #1 - DERAILMENT, INITIAL
Phase - MAINTAINING SPEED

Finding(s)
1. SURFACE - IRREGULAR
2. ELEVATION - IRREGULAR

Occurrence #2 - DERAILMENT, GENERAL
Phase - MAINTAINING SPEED

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
3. TANK SHELL - RUPTURED
4. TOP FITTINGS - DAMAGE

Occurrence #4 - FIRE/EXPLOSION
Phase - STOPPING

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # LAX88FRZ15 — BRIEF OF ACCIDENT — RUNDATE: 03/23/90

File No. - 81 — 08/04/88 — LAUDONVILLE, OH — Time (Lcl) - 2140 EDT

---Basic Information---

Reporting Railroad - CR
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 3,870,855.00
Non-Railroad - $ 25,000.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CR - CONSOLIDATED RAIL CORPORATION

---Railroad/Personnel Information---

Train Data
Railroad - CR
Type of Train - FREIGHT
Train ID - EXTRA 6460 EAST
Direction - EAST
Speed (Est.) - 54
Speed (Auth.) - 60

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 139/1
End of Train Monitor - MARKER
Length (Feet) - 10710
Trailing Tons - 15318
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 39/46

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CR - CONSOLIDATED RAIL CORPORATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
CRESTLINE, OH

Destination
PITTSBURGH, PA

Hazardous Materials
Involved - YES
Cars Involved - 5

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 0.10
Alignment - CURVE 1 D 30 M

---Narrative---
CR FREIGHT TRAIN EXTRA 6160 EAST, TRAVELING 54 MPH, HAD 46 CARS DERAIL, INCLUDING 5 TANK CARS. TWO OF THE TANK CARS RUPTURED, SPILLING HEXAMETHYLENE DIAMINE AND OCTYL ALCOHOL, WHICH IGNITED AND BURNED SEVERAL OF THE DERAILED CARS. ABOUT 150 PERSONS WERE EVACUATED. AN ADJOINING CORNFIELD WAS SATURATED WITH HAZMAT, AND ABOUT 5,000 CUBIC YARDS OF SOIL HAD TO BE REMOVED. A BROKEN RAIL WAS FOUND AT THE POINT OF DERAILMENT. THE BROKEN RAIL HAD A VERTICAL SPLIT HEAD DEFECT (VSH) ON THE BALL OF THE RAIL WHICH BROKE UNDER THE TRAIN. THE TRACK HAD BEEN VISUALLY INSPECTED EARLIER THAT DAY, BUT THE VSH WAS NOT DETECTED. THE RAILS WERE LAST TESTED BY A RAIL TEST CAR IN FEBRUARY 1988, BUT THE VSH WAS NOT DETECTED AT THAT TIME. A VSH IS NORMALLY A MANUFACTURING DEFECT.

File No. - 81 | 08/04/88 | LAUDONVILLE, OH | Time (Lcl) - 2140 EDT

Occurrence #1 - DERAILMENT
Phase - ACCELERATING

Finding(s)
1. RAIL - DEFECT, INTERNAL
2. MATERIAL DEFECT - MANUFACTURER
3. RAIL - BROKEN

Occurrence #2 - RUPTURE OF TANK CAR
Phase - STOPPING

Finding(s)
4. TANK CAR(S) - BREACHED

Occurrence #3 - FIRE
Phase - STOPPING

---Probable Cause- -

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3

Factor(s) relating to this accident is/are finding(s) 4

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FTW88FRZ28 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 83 — 08/06/88 — ELSBERRY, MO — Time (Lcl) - 0630 CDT

---Basic Information---

Reporting Railroad - BN
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 468,000.00
Non-Railroad - $ 100,000.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

BN - BURLINGTON NORTHERN RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - BN
Type of Train - FREIGHT
Train ID - EXTRA 7192 WEST
Direction - WEST
Speed (Est.) - 46
Speed (Auth.) - 60

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 113/0
End of Train Monitor - MONITOR
Length (Feet) - 6900
Trailing Tons - 3563
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 11/14

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

BN - BURLINGTON NORTHERN RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAWN

Evacuation - YES

Itinerary
Last Departure Point
BURLINGTON, IA

Destination
ST. LOUIS, MO

Hazardous Materials
Involved - YES
Cars Involved - 0

Track Information
Type/No. of Tracks - MAIN/1
Gradient - ASC. 0.18
Alignment - TANGENT

---Narrative---
FREIGHT TRAIN EXTRA 7192 WEST, CONSISTING OF 2 LOCOMOTIVE UNITS AND 113 CARS, HAD 14 CARS DERAIL WHILE MOVING 46 MPH. A ROLLER BEARING ON CAR DRGW 22517 HAD OVERHEATED, AND AN AXLE JOURNAL BURNED OFF. CAR DRGW 22517 DERAILED FIRST, AND LATER A GENERAL DERAILMENT OCCURRED. THE DERAILED CARS STRUCK ADJACENT STATIONARY FUEL AND ANHYDROUS AMMONIA STORAGE TANKS, AND THE FUEL TANK CAUGHT ON FIRE. THE ANHYDROUS AMMONIA TANK ALSO LEAKED. THE HAZMAT STORAGE TANKS WERE ABOUT 100 FEET FROM THE TRACK. AN EVACUATION OF ABOUT 600 PEOPLE RESULTED. THE TRAIN HAD PASSED A HOTBOX DETECTOR 96 MILES BEFORE THE ACCIDENT SITE AND A MINOR OVERHEATING WAS RECORDED FOR THAT WHEEL, BUT NOT ENOUGH TO ACTIVATE THE DETECTOR ALARM.

BRIEF OF ACCIDENT, continued

File No. - 83 | 08/06/88 | ELSBERRY, MO | Time (Lcl) - 0630 CDT

Occurrence #1 - TRAIN COMPONENT SYSTEM/[illegible]RE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. ROLLER BEARING - OVERHEATED
2. AXLE JOURNAL - BURN-OFF

Occurrence #2 - DERAILMENT, INITIAL
Phase - MAINTAINING SPEED

Occurrence #3 - DERAILMENT, GENERAL
Phase - MAINTAINING SPEED

Occurrence #4 - FIRE/EXPLOSION
Phase - STOPPING

Finding(s)
3. HAZMAT STORAGE - OFF TRACK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

Factor(s) relating to this accident is/are finding(s) 3

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL88FRZ20 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 84 — 08/08/88 — ELBERTON, GA — Time (Lcl) - 1325 EDT

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 2,987,200.00
Non-Railroad - $ 3,000,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	2	23	0

CSX - CSX TRANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 8152 NORTH
Direction - NORTH
Speed (Est.) - 60
Speed (Auth.) - 35

Train Consist/Damage
No. Loco. Units - 3
No. Cars/Caboose - 96/1
End of Train Monitor - NO
Length (Feet) - 6314
Trailing Tons - 8373
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 56/61

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
ELBERTON, GA

Destination
HAMLET, NC

Hazardous Materials
Involved - YES
Cars Involved - 7

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 1.20
Alignment - CURVE 4 D 30 M

---Narrative---
CSX FREIGHT TRAIN EXTRA 8152 NORTH, TRAVELING AT 60 MPH, HAD 61 FREIGHT CARS DERAIL. SIX TANK CARS AND A COVERED HOPPER CAR CONTAINING HAZARDOUS MATERIALS WERE DERAILED. ALL 7 CARS SPILLED OR LEAKED. THEY CONTAINED PARA-XYLENE, FERRIC CHLORIDE, AND ADEPIC ACID. ABOUT 300 PERSONS WERE EVACUATED FROM A 3-MILE RADIUS. TWO PERSONS WERE SERIOUSLY INJURED AND 23 WERE TREATED FOR HAZARDOUS MATERIAL CONTAMINATION AND RELEASED. THERE WAS NO FIRE. THERE WAS EXTENSIVE ENVIRONMENTAL DAMAGE TO THE GROUND WATER, AND ABOUT 1,000 FISH WERE KILLED IN LAKE RUSSELL. FUTURE ENVIRONMENTAL DAMAGE AND CLEANUP REQUIREMENTS ARE ESTIMATED TO BE EXTENSIVE. THE ENGINEER HAD LIMITED EXPERIENCE IN OPERATING HEAVY FREIGHT TRAINS IN GRADE TERRITORY. HIS REGULAR ASSIGNMENT WAS ON A WORK TRAIN. HE STATED "THE TRAIN HAD JUST GOT AWAY FROM ME." THE MAXIMUM AUTHORIZED SPEED WAS 35 MPH. AFTER THE ACCIDENT, THE CSX REVISED THE ENGINEER QUALIFICATION RULES.

File No. - 84 | 08/08/88 | ELBERTON, GA | Time (Lcl): 1325 EDT

Occurrence #1 - DERAILMENT
Phase - SLOWING

Finding(s)
1. SPEED - EXCESSIVE - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
2. TRAIN HANDLING - IMPROPER - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
3. OVER CONFIDENCE IN PERSONAL ABILITY - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
4. INADEQUATE PROCEDURE - COMPANY OPERATOR/MGMT

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
5. BOTTOM OUTLET VALVES - BROKEN

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

Factor(s) relating to this accident is/are finding(s) 3, 4, 5

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI88FRZ27 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 85 — 08/10/88 — ELM GROVE, WI — Time (Lcl) - 1305 CDT

---Basic Information---

Reporting Railroad - SOO
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TIMETABLE
RADIO

Property Losses
Railroad - $ 1,363,622.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

SOO - SOO LINE RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - SOO
Type of Train - FREIGHT
Train ID - EXTRA 6618 EAST
Direction - EAST
Speed (Est.) - 40
Speed (Auth.) - 49

Train Consist/Damage
No. Loco. Units - 3
No. Cars/Caboose - 116/0
End of Train Monitor - MARKER
Length (Feet) - 7959
Trailing Tons - 9754
Loco. Destroy/Derailed N/A
Cars Destroy/Derailed - 14/24

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

SOO - SOO LINE RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
PORTAGE, WI

Destination
MILWAUKEE, WI

Hazardous Materials
Involved - YES
Cars Involved - 5
Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 0.80
Alignment - CURVE 2 D O H

---Narrative---
SOO FREIGHT TRAIN EXTRA 6618 EAST WAS MOVING 40 MPH WHEN 24 CARS DERAILED. THE FIRST 25 CARS OF THE TRAIN WERE EMPTY 89-FT FLAT CARS. THE LAST OF THESE CARS INITIATED THE DERAILMENT WHEN IMPROPER TRAIN HANDLING ALLOWED A SLACK RUN-IN, AND FORCED THE CAR TO CLIMB THE OUTSIDE RAIL OF A CURVE. THE ENGINEER WAS BRAKING THE TRAIN BY MANIPULATING THE FEED VALVE INSTEAD OF THE AUTOMATIC BRAKE VALVE DUE TO AT LEAST 1 CAR WITH MALFUNCTIONING BRAKES IN THE TRAIN. THE ENGINEER AND THE DIVISION ROAD FOREMAN OF ENGINES KNEW OF THIS PROBLEM BEFORE THE TRAIN DEPARTED ITS INITIAL TERMINAL, BUT NO ACTION WAS TAKEN TO CORRECT IT. THREE LOADED TANK CARS CONTAINING ISOBUTANE AND METHANOL, AND 2 TANK CARS WITH HAZARDOUS MATERIAL RESIDUE WERE DERAILED IN THIS ACCIDENT. THERE WAS NO RELEASE OF HAZARDOUS MATERIAL, BUT 300 PERSONS WERE EVACUATED FROM THE BUSINESS DISTRICT OF ELM GROVE AS A PRECAUTIONARY MEASURE.

BRIEF OF ACCIDENT, continued

File No. - 85 | 08/10/88 | FIM GROVE, WI | Time (Lcl) - 1305 CDT

Occurrence #1 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - STANDING

Finding(s)
1. BRAKES - DEFECTIVE
2. OPERATING RULES - NOT OBSERVED - DIVISON OFFICER
3. INATTENTIVE - DIVISION OFFICER
4. INADEQUATE SURVEILLANCE OF OPERATION - COMPANY OPERATOR/MGMT

Occurrence #2 - DERAILMENT
Phase - MAINTAINING POWER

Finding(s)
5. TERRAIN CONDITION - DOWNHILL
6. TRAIN HANDLING - IMPROPER - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
7. OPERATING RULES - NOT OBSERVED - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
8. INADEQUATE SURVEILLANCE OF OPERATION - COMPANY OPERATOR/MGMT
9. TRAIN MAKEUP - POOR - DIVISON OFFICER
10. INSUFFICIENT STANDARDS/REQUIREMENTS - COMPANY OPERATOR/MGMT

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 2, 6, 7

Factor(s) relating to this accident is/are finding(s) 1, 4, 8, 9, 10

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL88FRZ21 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 86 — 08/13/88 — ATHENS, GA — Time (Lcl) - 0201 EDT

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 639,650.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CSX - CSX RANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 8965 WEST
Direction - WEST
Speed (Est.) - 46
Speed (Auth.) - 55

Train Consist/Damage
No. Loco. Units - 7
No. Cars/Caboose - 152/0
End of Train Monitor - MARKER
Length (feet) - 8151
Trailing Tons - 9542
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 12/41

Crew Information
Front End - 4
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
ABBEVILLE, GA

Destination
ATLANTA, GA

Hazardous Materials
Involved - YES
Cars Involved - 6

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 0.05
Alignment - TANGENT

---Narrative---
CSX FREIGHT TRAIN EXTRA 8965 WEST HAD 41 CARS DERAIL WHILE MOVING ABOUT 46 MPH, AS RECORDED BY A HOTBOX DETECTOR. THE TRAIN WAS APPROACHING AN AREA WITH A SPEED RESTRICTION OF 25 MPH WHEN THE ENGINEER ATTEMPTED TO SLOW THE TRAIN BY MAKING AN APPLICATION OF THE LOCOMOTIVE INDEPENDENT BRAKE, INSTEAD OF A SERVICE BRAKE APPLICATION. A RUN-IN OCCURRED WHICH BROKE A COUPLER KNUCKLE ON THE 18TH CAR, TILTED A RAIL OVER, AND STARTED A DERAILMENT. SIX OF THE DERAILED CARS WERE EMPTY TANK CARS. ONE OF THEM OVERTURNED AND ALLOWED A SMALL AMOUNT OF RESIDUAL SULFUR DIOXIDE TO ESCAPE THROUGH A DOME FITTING. ONE LOCAL RESIDENT WAS EVACUATED FROM A NEARBY RESIDENCE.

File No. - 86 | 08/13/88 | ATHENS, GA | Time (Lcl) - 0201 EDT

Occurrence #1 - DERAILMENT
Phase - DECELERATING

Finding(s)
1. TRAIN HANDLING - IMPROPER - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
2. BRAKES - IMPROPER USE OF - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
3. INATTENTIVE - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
4. TRAIN - SLACK RUN-IN
5. COUPLER KNUCKLE - BROKEN
6. TRACK GAGE - EXCESSIVE
7. INADEQUATE SURVEILLANCE OF OPERATION - COMPANY OPERATOR/MGMT

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
8. TOP FITTINGS - NOT SECURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 4, 6

Factor(s) relating to this accident is/are finding(s) 5, 7, 8

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL88FRZ22 — BRIEF OF ACCIDENT — RUNDATE: 12/21/90

File No. - 88 — 08/18/88 — MEMPHIS, TN — Time (Lcl) - 1600 CDT

---Basic Information---

Reporting Railroad - ICG
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - STANDING
Method of Operation - N/A

Property Losses
Railroad - $ 150,000.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	4	0

ICG - ILLINOIS CENTRAL GULF RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - ZGAT
Type of Train - SINGLE CAR
Train ID - N/A
Direction - N/A
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 0
No. Cars/Caboose - 1/0
End of Train Monitor - NO
Length (Feet) - 65
Trailing Tons - N/A
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - N/A

Crew Information
Front End - 0
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - NO
Operational - N/A

ZGAT - GENERAL AMERICAN TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
MEMPHIS, TN

Destination
MEMPHIS, TN

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - INDUSTRIAL/8
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
AN ICG SWITCHING CREW HAD SWITCHED TANK CAR GATX 301045 TO A HOLDING TRACK IN THE YARD OF THE VELSICOL CHEMICAL PLANT. THE CAR CONTAINED 20,000 GALLONS OF MURIATIC ACID. ABOUT 4 HOURS LATER, A PLANT EMPLOYEE NOTICED THE CAR WAS LEAKING AND A CLOUD WAS FORMING ABOVE IT. THE ENTIRE LOAD OF ACID SPILLED OUT ONTO THE GROUND. A FIRE CHIEF ARRIVING AT THE SCENE EVACUATED AN AREA EXTENDING ONE-QUARTER MILE TO THE SOUTH AND WEST. THE INVESTIGATION DISCLOSED THAT THE TANK CAR HAD BEEN IN AN ACCIDENT IN MARCH OF 1988 AND SENT TO THE CAR OWNER'S PLANT (GATC) FOR REPAIRS. AN OVERSIGHT BY A CLERK IN THE GATC'S FLEET SERVICE DEPARTMENT ALLOWED THE CAR TO BE CLASSIFIED AS OK BEFORE THE CAR LINING HAD BEEN REPAIRED. WHEN THE CAR WAS LOADED, THE HEAD WELD ON ONE END OF THE CAR SPLIT, RESULTING IN A 77-INCH CRACK THAT SPILLED THE LOAD. THREE RAILROAD EMPLOYEES AND 1 EMPLOYLE AT A NEARBY JUNKYARD COMPLAINED OF THROAT IRRITATION.

BRIEF OF ACCIDENT, continued

File No. - 88 | 08/18/88 | MEMPHIS, TN | Time (Lcl) - 1600 CDT

Occurrence #1 - RUPTURE OF TANK CAR
Phase - STANDING

Finding(s)
1. TANK CAR HEAD (A-END) - RUPTURED
2. EQUIPMENT REPAIR - NOT PERFORMED - OTHER MAINTENANCE PERSON
3. INATTENTIVE - CLERK
4. INADEQUATE PROCEDURE - COMPANY OPERATOR/MGMT

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3

Factor(s) relating to this accident is/are finding(s) 4

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL88FRZ23 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 95 — 09/15/88 — JACKSONVILLE, FL — Time (Lcl) - 0206 EDT

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 1,368,000.00
Non-Railroad - $ 420,607.00

Fire - NO

Injuries	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	1	2	0

CSX - CSX TRANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 8923 NORTH
Direction - NORTH
Speed (Est.) - 64
Speed (Auth.) - 50

Train Consist/Damage
No. Loco. Units - 6
No. Cars/Caboose - 40/1
End of Train Monitor - NO
Length (Feet) - 2635
Trailing Tons - 3763
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 18/26

Crew Information
Front End - 2
Rear End - 2
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - NO

Itinerary
Last Departure Point
BAINBRIDGE, GA

Destination
JACKSONVILLE, FL

Hazardous Materials
Involved - YES
Cars Involved - 4

Track Information
Type/No. of Tracks - MAIN/1
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
CSX FREIGHT TRAIN EXTRA 8923 NORTH HAD 26 CARS DERAIL WHILE MOVING OVER A GRADE CROSSING AT 64 MPH IN A 50 MPH AREA. A TANK CAR CONTAINING POTASSIUM HYDROXIDE OVERTURNED AND THE CARGO SPILLED. THREE FLORIDA HIGHWAY PATROL TROOPERS INVESTIGATING THE SITE INHALED FUMES AND WERE HOSPITALIZED. SPEED TAPES INDICATED THE TRAIN HAD BEEN OPERATED AT ERRATIC SPEEDS. THE ENGINEER HAD SLOWED THE TRAIN USING ONLY THE INDEPENDENT LOCOMOTIVE BRAKES, WHICH IS NOT CONSISTENT WITH GOOD TRAIN HANDLING TECHNIQUES. THE RESULTING FORCES DISTORTED THE TRACK STRUCTURE WHICH WAS NOT PROPERLY RESTRAINED BY THE BALLAST. EVIDENCE OF SOIL MIGRATION FROM UNDER THE TRACK STRUCTURE RESULTED IN THE BALLAST SINKING FROM UNDER THE ROAD CROSSING. THE RUBBER MATERIAL USED AT THE CROSSING MADE OBSERVATION OF THE BALLAST CONDITION BY TRACK INSPECTORS IMPOSSIBLE DURING NORMAL INSPECTION. LOSSES WERE INCURRED BY LOCAL BUSINESSES THAT COULD NOT OPEN THE NEXT DAY, AND BY DAMAGES TO TELEPHONE CABLES UNDER THE TRACK.

File No. - 95 | 09/15/88 | JACKSONVILLE, FL | Time (Lcl) - 0206 EDT

Occurrence #1 - DERAILMENT
Phase - STOPPING

Finding(s)
1. SPEED - EXCESSIVE - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
2. TRAIN HANDLING - IMPROPER - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
3. INADEQUATE SURVEILLANCE OF OPERATION - COMPANY OPERATOR/MGMT
4. BALLAST - COLLAPSED
5. TRACK INSPECTION - NOT POSSIBLE -

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 4

Factor(s) relating to this accident is/are finding(s) 3, 5

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI88FRZ29 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 100 — 09/25/88 — SUMMIT, IL — Time (Lcl) - 0845 CDT

---Basic Information---

Reporting Railroad - ICG
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - YARD RULES
AUTOMATIC BLOCK

Property Losses
Railroad - $ 87,500.00
Non-Railroad - $ 10,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	30

ICG - ILLINOIS CENTRAL GULF RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - ICG
Type of Train - LOCAL FREIGHT
Train ID - EXTRA 8343 SOUTH
Direction - SOUTH
Speed (Est.) - 10
Speed (Auth.) - 15

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 54/1
End of Train Monitor - NO
Length (Feet) - 2797
Trailing Tons - 3928
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 0/6

Crew Information
Front End - 2
Rear End - 1
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

ICG - ILLINOIS CENTRAL GULF RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
CHICAGO, IL

Destination
JOLIET, IL

Hazardous Materials
Involved - YES
Cars Involved - 5

Track Information
Type/No. of Tracks - MAIN/3
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
ICG LOCAL FREIGHT TRAIN EXTRA 8343 SOUTH HAD 6 CARS DERAIL WHILE MOVING 10 MPH THROUGH A CROSSOVER. FOUR OF THE CARS CONTAINED HAZARDOUS MATERIALS, AND 1 TANK CAR OF PHOSPHORIC ACID WAS PUNCTURED BY A PIECE OF RAIL AND LEAKED OVER 200 GALLONS. A YARD SWITCHMAN ALINED THE SWITCH FOR THE TRAIN TO GO THROUGH THE CROSSOVER, BUT HE DID NOT LOCK IT PROPERLY. AS THE CARS MOVED OVER THE SWITCH, THE POINTS GAPPED OPEN AND THE 27TH CAR HEADED TOWARD THE NORTHBOUND TRACK INSTEAD OF FOLLOWING ACROSS TO THE SOUTHBOUND TRACK. THE CARS WENT ABOUT 300 FEET BEFORE THE PILEUP BEGAN. ABOUT 30 PERSONS WERE EVACUATED FOR OVER 3 HOURS.

BRIEF OF ACCIDENT, continued

File No. - 100 | 09/25/88 | SUMMIT, IL | Time (Lcl) - 0845 CDT

Occurrence #1 - DERAILMENT
Phase - ACCELERATING

Finding(s)
1. SWITCH STAND LOCK - UNLOCKED
2. SWITCHING RULES - NOT COMPLIED - YARD BRAKEMAN/YARD HELPER
3. SWITCH POINT(S) - OPEN

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - ACCELERATING

Finding(s)
4. TANK CAR(S) - PUNCTURED

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---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3

Factor(s) relating to this accident is/are finding(s) 4

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # AIL89FRZ02 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 103 — 10/13/88 — RINEYVILLE, KY — Time (Lcl) - 0345 CDT

---Basic Information---

Reporting Railroad - PAL
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TIMETABLE

Property Losses
Railroad - $ 189,169.00
Non-Railroad - $ 24,569.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	2
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

PAL - PADUCAH & LOUISVILLE RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - PAL
Type of Train - FREIGHT
Train ID - EXTRA 8301 NORTH
Direction - NORTH
Speed (Est.) - 30
Speed (Auth.) - 30

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 49/0
End of Train Monitor - MONITOR
Length (Feet) - 3345
Trailing Tons - 2000
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 0/12

Crew Information
Front End - 2
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

PAL - PADUCAH & LOUISVILLE RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
BEAVER DAM, KY

Destination
LOUISVILLE, KY

Hazardous Materials
Involved - YES
Cars Involved - 7

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 0.28
Alignment - CURVE 5 D 0 M

---Narrative---
PAL FREIGHT TRAIN EXTRA 8301 NORTH HAD 12 CARS DERAIL IN A FIVE-DEGREE LEFT CURVE WHILE MOVING 30 MPH INVESTIGATION REVEALED A STRESS FRACTURE IN THE OUTSIDE RAIL OF THE CURVE RESULTED IN THE RAIL BREAKING UNDER THE TRAIN. SEVEN OF THE DERAILED CARS WERE TANK CARS CONTAINING HAZARDOUS MATERIALS. THREE OF THE TANK CARS LEAKED PHOSPHORIC ACID, ACETIC ACID AND CAUSTIC SODA. 10 FAMILIES WERE EVACUATED FROM THEIR HOMES. THE TRACK HAD BEEN ULTRASONICALLY TESTED ABOUT 2 WEEKS BEFORE THE ACCIDENT. THE TESTING REVEALED THE FRACTURE IN THE RAIL, BUT THE TEST EQUIPMENT OPERATOR ATTRIBUTED THE DEFECT TO FLAWS IN THE RAIL HEAD AND THE FRACTURE WAS NOT REPORTED TO THE RAILROAD.

File No. - 103 | 10/13/88 | RINEYVILLE, KY | Time (Lcl) - 0345 CDT

Occurrence #1 - TRACK COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase -

Finding(s)
1. RAIL - FRACTURED
2. TRACK INSPECTION - MISJUDGED - TRACK EQUIPMENT OPERATOR
3. VISUAL/AURAL PERCEPTION - TRACK EQUIPMENT OPERATOR
4. INADEQUATE SUBSTANTIATION PROCESS - CONTRACTOR PERSONNEL

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

Finding(s)
5. RAIL - BROKEN

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
6. TANK CAR(S) - LEAK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 5

Factor(s) relating to this accident is/are finding(s) 4, 6

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL89FRZ03 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 104 — 10/16/88 — EASLEY, SC — Time (Lcl) - 0700 EDT

---Basic Information---

Reporting Railroad - NS
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 837,645.00
Non-Railroad - $ 101,823.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

NS - NORFOLK SOUTHERN RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - NS
Type of Train - FREIGHT
Train ID - EXTRA 7011 NORTH
Direction - NORTH
Speed (Est.) - 42
Speed (Auth.) - 55

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 121/1
End of Train Monitor - NO
Length (Feet) - 7000
Trailing Tons - 9963
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 11/20

Crew Information
Front End - 3
Rear End - 1
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

NS - NORFOLK SOUTHERN RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DAWN

Evacuation - YES

Itinerary
Last Departure Point
ATLANTA, GA

Destination
GREENVILLE, SC

Hazardous Materials
Involved - YES
Cars Involved - 10

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 0.20
Alignment - TANGENT

---Narrative---
NS FREIGHT TRAIN EXTRA 7011 NORTH HAD 20 CARS DERAIL WHILE MOVING 42 MPH. TEN OF THE DERAILED CARS WERE TANK CARS CONTAINING HAZARDOUS MATERIALS. FOUR TANK CARS OF CAUSTIC SODA AND 1 TANK CAR OF STYRENE MONOMER LEAKED OR SPILLED THEIR CARGO. A PRECAUTIONARY EVACUATION OF ABOUT 130 PERSONS WAS ORDERED BY A LOCAL FIRE CHIEF. THE FIRST CAR TO DERAIL WAS A BOXCAR WITH A BROKEN WHEEL THAT HAD OVERHEATED. THE FRACTURE HAD BEGUN AT A SERIAL NUMBER THAT HAD BEEN HOT STAMPED ON THE BACK OF THE WHEEL RIM DURING MANUFACTURING. WHEELS ARE NO LONGER STAMPED IN THIS MANNER, BUT THE WHEEL PREDATED THIS CHANGE. THE WHEEL HAD APPARENTLY OVERHEATED AND CRACKED FROM BRAKING. THE WHEEL THEN SLID INWARD ON THE AXLE AND DROPPED INTO THE TRACK GAGE. FARTHER ON, THE DERAILED WHEEL STRUCK A SWITCH FROG AND CLOSURE RAIL, STARTING A GENERAL DERAILMENT.

File No. - 104 | 10/16/88 | EASLEY, SC | Time (Lcl) - 0700 EDT

Occurrence #1 - DERAILMENT,INITIAL
Phase - MAINTAINING SPEED

Finding(s)
1. WHEEL - OVERHEATED
2. WHEEL - CRACKED
3. MATERIAL DEFECT - MANUFACTURER
4. WHEEL - LOOSE

Occurrence #2 - DERAILMENT, GENERAL
Phase - SLOWING

Finding(s)
5. SWITCH FROG - STRUCK
6. CLOSURE RAIL - STRUCK

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase STOPPING

Finding(s)
7. DOME - LEAK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 4, 5, 6

Factor(s) relating to this accident is/are finding(s) 7

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ05 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 112 — 10/26/88 — PEARL, IL — Time (Lcl) - 0622 CDT

---Basic Information---

Reporting Railroad - CMNW
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TIMETABLE
TRACK WARRANT CONT

Property Losses
Railroad - $ 283,000.00
Non-Railroad - $ 0.00
Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CMNW - CHICAGO MISSOURI & WESTERN RAILWAY

---Railroad/Personnel Information---

Train Data
Railroad - CMNW
Type of Train - FREIGHT
Train ID - EXTRA 3018 EAST
Direction - EAST
Speed (Est.) - 7
Speed (Auth.) - 10

Train Consist/Damage
No. Loco. Units - 3
No. Cars/Caboose - 58/0
End of Train Monitor - MARKER
Length (Feet) - 3770
Trailing Tons - 4630
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 0/13

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

CMNW - CHICAGO MISSOURI & WESTERN RAILWAY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - NO

Itinerary
Last Departure Point
SLATER, MO

Destination
ROODHOUSE, IL

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 0.79
Alignment - TANGENT

---Narrative---
CMW FREIGHT TRAIN EXTRA 3018 EAST HAD 13 CARS DERAIL WHILE MOVING ABOUT 7 MPH. ONE OF THE DERAILED CARS WAS A TANK CAR LOADED WITH 23,000 GALLONS OF ISOPROPANOL. ABOUT 4,000 GALLONS OF CARGO LEAKED FROM A BROKEN MEASURING STICK APERTURE IN THE DOME THAT WAS DAMAGED WHEN THE CAR ROLLED OVER. THE DERAILMENT OCCURRED AT A RAIL THAT HAD A HEAD AND WEB SEPARATION AND THE RAIL BROKE UNDER THE TRAIN. THERE WAS EVIDENCE OF VERTICAL SPLIT HEAD DEFECTS THAT EXISTED PRIOR TO THE DERAILMENT. THE RAIL WAS INSPECTED THE DAY BEFORE THE ACCIDENT FROM A HI-RAIL VEHICLE AND NO DEFECTS WERE NOTED. THIS TYPE OF INSPECTION IS PERMITTED BY FRA REGULATIONS. A GENERAL ORDER HAD BEEN ISSUED REDUCING THE MAXIMUM SPEED TO 10 MPH IN THE AREA DUE TO POOR TRACK CONDITIONS.

File No. - 112 | 10/26/88 | PEARL, IL | Time (Lcl) - 0622 CDT

Occurrence #1 - TRACK COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase -

Finding(s)
1. RAIL HEAD - SEPARATION
2. TRACK INSPECTION - INADEQUATE - MAINTENANCE OF WAY INSPECTOR
3. INSUFFICIENT STANDARDS/REQUIREMENTS - FRA

Occurrence #2 - DERAILMENT
Phase - SLOWING

Finding(s)
4. RAIL - BROKEN

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
5. DOME - LEAK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 4

Factor(s) relating to this accident is/are finding(s) 2, 5

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FTW89FRZ01 — BRIEF OF ACCIDENT — RUNDATE: 12/19/90
File No. - 113 — 10/26/88 — MORGANZA, LA — Time (Lcl) - 0440 CDT

---Basic Information---

Reporting Railroad - LA
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRACK WARRANT (...

Property Losses
Railroad - $ 316,300.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	300

LA - LOUISIANA & ARKANSAS RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - LA
Type of Train - FREIGHT
Train ID - EXTRA 4003 NORTH
Direction - NORTH
Speed (Est.) - 22
Speed (Auth.) - 25

Train Consist/Damage
No. Loco. Units - 3
No. Cars/Caboose - 94/1
End of Train Monitor - N/A
Length (Feet) - 5749
Trailing Tons - 7003
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 2/14

Crew Information
Front End - 3
Rear End - 1
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

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LA - LOUISIANA & ARKANSAS RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
NEW ORLEANS, LA

Destination
ALEXANDRIA, LA

Hazardous Materials
Involved - YES
Cars Involved - 6

Track Information
Type/No. of Tracks - MAIN/1
Gradient - LEVEL
Alignment - CURVE 1 D 10 M

---Narrative---
LA FREIGHT TRAIN EXTRA 4003 NORTH HAD 14 CARS DERAIL WHILE CROSSING A BRIDGE AT 22 MPH. SIX TANK CARS CONTAINING HAZMAT WERE DERAILED. ONE EMPTY TANK CAR THAT LAST CONTAINED TOLUENE DIISOCYANATE WAS PUNCTURED, BUT NO PRODUCT SPILLED. A PRECAUTIONARY EVACUATION OF ABOUT 300 PERSONS WAS MADE FOR ABOUT 5 HOURS. A PRIOR TRAIN REPORTED A SOUND THAT WAS LIKE A RAIL BREAKING. A TRACK FOREMAN WAS SENT OUT TO INSPECT THE TRACK BEFORE THE ARRIVAL OF 4003. HOWEVER, DUE TO MISUNDERSTOOD RADIO COMMUNICATIONS, HE WENT TO THE WRONG END OF THE BRIDGE AND FOUND GAPPED RAILS AND MISSING RAIL BOLTS. ASSUMING THIS WAS WHAT CAUSED THE NOISE PREVIOUSLY HEARD, HE CALLED THE CREW OF 4003 AND TOLD THEM TO PROCEED. WHEN 4003 PASSED OVER THE OTHER END OF THE BRIDGE, THE TRAIN DERAILED. INVESTIGATION REVEALED THAT 2 JOINT BARS HAD BROKEN AT THE POINT OF DERAILMENT. TOX TESTS OF THE CREW INDICATED THE PRESENCE OF MARIJUANA IN THE HEAD BRAKEMAN AT CONCENTRATIONS OF 1 NG/ML (BLOOD), AND MARIJUANA METABOLITE AT 44 NG/ML (BLOOD) AND 255 NG/ML (URINE).

BRIEF OF ACCIDENT, continued

File No. - 113 | 10/26/88 | MORGANZA, LA | Time (Lcl) - 0440 CDT

Occurrence #1 - DERAILMENT
Phase - MAINTAINING SPEED

Finding(s)
1. JOINT BAR, NONCOMPROMISE - FATIGUED
2. JOINT BAR, NONCOMPROMISE - BROKEN
3. TRACK INSPECTION - INACCURATE - TRACK GANG FOREMAN
4. VISUAL/AURAL PERCEPTION - TRACK GANG FOREMAN
5. USE OF DRUGS - ROAD FREIGHT BRAKEMAN/FLAGMAN (through freight)

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

Factor(s) relating to this accident is/are finding(s) 3, 4

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # LAX89FRZ02 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 115 — 11/02/88 — NEWCASTLE, CA — Time (Lcl) - 0455 PST

---Basic Information---

Reporting Railroad - SP
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 907,150.00
Non-Railroad - $ 100,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	5
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	2	0

SP - SOUTHERN PACIFIC TRANSPORTATION COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - SP
Type of Train - FREIGHT
Train ID - EXTRA 6830 WEST
Direction - WEST
Speed (Est.) - 31
Speed (Auth.) - 30

Train Consist/Damage
No. Loco. Units - 10
No. Cars/Caboose - 106/1
End of Train Monitor - NO
Length (Feet) - 6210
Trailing Tons - 8036
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 17/22

Crew Information
Front End - 3
Rear End - 2
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

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SP - SOUTHERN PACIFIC TRANSPORTATION COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - RAIN, FOG
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
SPARKS, NE

Destination
OAKLAND, CA

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 1.90
Alignment - CURVE 1 D 34 M

---Narrative---
SP FREIGHT TRAIN EXTRA 6830 WEST HAD 22 CARS DERAIL WHILE MOVING 31 MPH. ABOUT 300 PERSONS WERE EVACUATED FOR ABOUT 16 HOURS AS A PRECAUTIONARY MEASURE AFTER A DERAILED TANK CAR CONTAINING ETHYL ALCOHOL WAS RUPTURED AND RELEASED ITS CARGO. TWO PERSONS WERE TREATED AND RELEASED FOR NAUSEA RESULTING FROM FUMES INHALATION. THE WEATHER WAS DRIZZLING RAIN AND HEAVY FOG. IT REQUIRED 5 HOURS FOR EMERGENCY PERSONNEL TO IDENTIFY THE SPILLED ALCOHOL DUE TO ERRORS IN THE TRAIN CONSIST. ABOUT 20 MILES BEFORE THE DERAILMENT, A HOTBOX DETECTOR INDICATED A HOT AXLE ON THE 5TH CAR. THE CONDUCTOR AND BRAKEMAN WALKED THE TRAIN, BUT COULD NOT LOCATE A HOT AXLE, SO THE TRAIN PROCEEDED. ABOUT 1 MILE BEFORE THE DERAILMENT, A DRAGGING EQUIPMENT DETECTOR WAS ACTUATED, BUT THE CONDUCTOR DID NOT SEE IT BECAUSE ITS WARNING LIGHT WAS BURNED OUT. AN OVERHEATED BEARING HAD BURNED OFF AN AXLE JOURNAL ON THE 5TH CAR, STARTING THE DERAILMENT. LABORATORY ANALYSIS DETERMINED A ROLLER IN THE BEARING WAS FAULTY.

File No. - 115 | 11/02/88 | NEWCASTLE, CA | Time (Lcl) - 0455 PST

Occurrence #1 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. ROLLER BEARING - DEFECTIVE
2. MATERIAL DEFECT - MANUFACTURER
3. ROLLER BEARING - OVERHEATED
4. SPECIAL INSTRUCTIONS - NOT COMPLIED - ROAD FREIGHT CONDUCTOR (through freight)
5. INATTENTIVE - ROAD FREIGHT CONDUCTOR (through freight)
6. AXLE JOURNAL - BURN-OFF
7. DRAGGING EQUIPMENT DETECTOR - LIGHT OUT

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
8. TANK CAR(S) - RUPTURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 4, 6, 7

Factor(s) relating to this accident is/are finding(s) 5

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ06 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 116 — 11/09/88 — LYNDON STATION, WI — Time (Lcl) - 0810 CST

---Basic Information---

Reporting Railroad - SOO
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TIMETABLE

Property Losses
Railroad - $ 343,401.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	2

SOO - SOO LINE RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - SOO
Type of Train - FREIGHT
Train ID - EXTRA 767 WEST
Direction - WEST
Speed (Est.) - 40
Speed (Auth.) - 50

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 65/1
End of Train Monitor - NO
Length (feet) - 3658
Trailing Tons - 2614
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 1/14

Crew Information
Front End - 2
Rear End - 1
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

SOO - SOO LINE RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
PORTAGE, WI

Destination
LA CROSSE, WI

Hazardous Materials
Involved - YES
Cars Involved - 2

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 0.53
Alignment - TANGENT

---Narrative---
SOO FREIGHT EXTRA 767 WEST HAD 14 CARS DERAIL WHILE MOVING 40 MPH. A DERAILED TANK CAR ROLLED DOWN AN EMBANKMENT, SPILLING PART OF ITS CARGO OF CARBOLIC ACID. TWO LOCAL RESIDENTS WERE EVACUATED FROM THE RURAL AREA. THE ENGINEER HAD RECEIVED A MESSAGE FROM A RADIO-EQUIPPED TALKING HOTBOX DETECTOR WARNING OF A HOT AXLE ON THE 27TH CAR FROM THE REAR OF THE TRAIN. THE ENGINEER DID NOT STOP THE TRAIN, OPTING INSTEAD TO TRAVEL ABOUT 3 MILES TO HIS TERMINAL. UPON ARRIVAL, HE NOTIFIED THE CONDUCTOR WHO CHECKED ABOUT 20 CARS FROM THE CABOOSE. THEY DID NOT NOTIFY THE DISPATCHER, NOR DID THEY ALERT THE OUTBOUND CREW. ABOUT 2 HOURS LATER, THE TRAIN DEPARTED WITH A NEW CREW. THE TRAIN WENT ABOUT 22 MILES AND THE BEARING FAILED, RESULTING IN A BURNED OFF AXLE JOURNAL AND THE DERAILMENT.

File No. - 116 | 11/09/88 | LYNDON STATION, WI | Time (Lcl) - 0810 CST

Occurrence #1 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. ROLLER BEARING - OVERHEATED
2. TIMETABLE SPECIAL INSTRUCTIONS - NOT COMPLIED - ENTIRE TRAIN CREW
3. EQUIPMENT INSPECTION - NOT PERFORMED - ENTIRE TRAIN CREW

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

Finding(s)
4. ROLLER BEARING - FAILURE (TOTAL)
5. AXLE JOURNAL - BURN-OFF

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
6. TANK CAR(S) - BREACHED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3, 4, 5

Factor(s) relating to this accident is/are finding(s) 6

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # ATL89FRZ05 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 120 — 11/19/88 — BANGOR, AL — Time (Lcl) - 1700 CST

---Basic Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 1,947,464.00
Non-Railroad - $ 80,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

CSX - CSX TRANSPORTATION

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - EXTRA 8425 NORTH
Direction - NORTH
Speed (Est.) - 56
Speed (Auth.) - 45

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 80/0
End of Train Monitor - MONITOR
Length (Feet) - 5853
Trailing Tons - 5675
Loco. Destroy/Derailed - 0/4
Cars Destroy/Derailed - 21/73

Crew Information
Front End - 4
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY, RAIN
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
BIRMINGHAM, AL

Destination
NASHVILLE, TN

Hazardous Materials
Involved - YES
Cars Involved - 3

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 0.40
Alignment - CURVE 4 D 0 M

---Narrative---
CSX FREIGHT TRAIN EXTRA 8425 NORTH HAD ALL 4 LOCOMOTIVE UNITS AND 73 CARS DERAIL WHILE MOVING 56 MPH IN A 4-DEGREE CURVE THAT HAD A SPEED RESTRICTION OF 45 MPH. TWO TANK CARS CONTAINING SULFURIC ACID AND DIETHYLENE GLYCOL WERE DAMAGED AND SPILLED THEIR CARGO. THE VAPOR CLOUD RESULTED IN EVACUATION OF ABOUT 1,000 PERSONS. INVESTIGATION REVEALED THAT THE ENGINEER HAD WORKED A REGULAR SHIFT AND THEN WAS OFF-DUTY FOR EIGHT HOURS AND 25 MINUTES BEFORE THIS TRIP. HE ADMITTED TO SLEEPING ONLY ABOUT 30 MINUTES DURING THE OFF-DUTY PERIOD WHILE SITTING ON A CHAIR. HE DID NOT REQUEST TO BE EXCUSED FROM DUTY DUE TO LACK OF SLEEP. HE HAD BEEN BACK ON DUTY ABOUT 1 AND 1/2 HOURS BEFORE THE ACCIDENT. THERE WERE NUMEROUS DEFECTIVE CROSSTIES AT THE POINT OF DERAILMENT IN THE CURVE, WHICH ALLOWED THE RAIL TO CANT OUTWARD UNDER THE FORCES OF THE EXCESSIVE SPEED.

File No. - 120 | 11/19/88 | BANGOR, AL | Time (Lcl) - 1700 CST

Occurrence #1 - DERAILMENT
Phase - SLOWING

Finding(s)
1. CROSSTIES - ROTTED/WEATHERED
2. TRACK INSPECTION - INADEQUATE - MAINTENANCE OF WAY INSPECTOR
3. RAIL - CANTED
4. TRAIN - OVERSPEED
5. TRAIN HANDLING - IMPROPER - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
6. FATIGUE (lack of sleep) - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
7. SPEED - DISREGARDED - ROAD FREIGHT CONDUCTOR (through freight)

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
8. TANK CAR(S) - PUNCTURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 3, 4, 5, 6, 7

Factor(s) relating to this accident is/are finding(s) 2, 8

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ07 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 123 — 11/20/88 — LANAGAN, MO — Time (Lcl) - 2015 CST

---Basic Information---

Reporting Railroad - KCS
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL TIMETABLE

Property Losses
Railroad - $ 217,000.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

KCS - KANSAS CITY SOUTHERN RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - KCS
Type of Train - FREIGHT
Train ID - EXTRA 664 NORTH
Direction - NORTH
Speed (Est.) - 31
Speed (Auth.) - 40

Train Consist/Damage
No. Loco. Units - 5
No. Cars/Caboose - 69/0
End of Train Monitor - MONITOR
Length (Feet) - 4419
Trailing Tons - 5969
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 0/9

Crew Information
Front End - 4
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

KCS - KANSAS CITY SOUTHERN RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
HEAVNER, OK

Destination
PITTSBURG, KS

Hazardous Materials
Involved - YES
Cars involved - 3

Track Information
Type/No. of Tracks - MAIN
Gradient - DES. .00
Alignment - CURVE 6 D 0 M

---Narrative---
KCS FREIGHT TRAIN EXTRA 664 NORTH HAD THE LAST 5 CARS DERAIL WHILE MOVING 31 MPH. INVESTIGATION REVEALED A RAIL HAD BROKEN UNDER THE TRAIN. AAR LABORATORY ANALYSIS OF THE RECOVERED PIECE OF THE BROKEN RAIL DISCLOSED A BRITTLE FRACTURE BUT DID NOT DISCLOSE PRE-EXISTING CRACKS IN THE RAIL. SOME PIECES BROKEN FROM THE BASE OF THE RAIL WERE NOT RECOVERED. TEMPERATURES IN THE AREA HAD DROPPED 40 DEGREES THAT DAY, TO 25 DEGREES. THREE TANK CARS LOADED WITH METHYL MERCAPTAN, LIQUID ARGON, AND PETROLEUM NAPTHA DERAILED BUT DID NOT LEAK, EXCEPT THAT A SMALL AMOUNT OF LIQUID ARGON WAS VENTED THROUGH A SAFETY RELEASE VALVE. LOCAL POLICE ORDERED A PRECAUTIONARY EVACUATION OF 20 PERSONS FOR ABOUT ONE HALF HOUR.

File No. - 123 | 11/20/88 | LANAGAN, MO | Time (Lcl) - 2015 CST

Occurrence #1 - TRACK COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. RAIL, CONTINUOUSLY WELDED - BRITTLE FRACTURE
2. WEATHER - TEMPERATURE EXTREMES

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - MISCELLANEOUS/OTHER

Finding(s)
3. SAFETY RELIEF VALVES - OPEN

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1

Factor(s) relating to this accident is/are finding(s) 2, 3

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # FIW89FR004 — BRIEF OF ACCIDENT — RUNDATE: 12/19/90

File No. - 126 — 11/25/88 — FRUITVALE, TX — Time (Lcl) - 1915 CST

---Basic Information---

Reporting Railroad - UP
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL
TIMETABLE

Property Losses
Railroad - $ 1,461,900.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	2	0
Other	0	0	0	200

UP - UNION PACIFIC RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - UP
Type of Train - FREIGHT
Train ID - EXTRA 5055 WEST
Direction - WEST
Speed (Est.) - 35
Speed (Auth.) - 60

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 89/1
End of Train Monitor - MARKER
Length (Feet) - 5830
Trailing Tons - 7086
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 18/48

Crew Information
Front End - 2
Rear End - 2
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

UP - UNION PACIFIC RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - RAIN, HAIL
Condition of Light - DUSK

Evacuation - YES

Itinerary
Last Departure Point
MINEOLA, TX

Destination
FORT WORTH, TX

Hazardous Materials
Involved - YES
Cars Involved - 5

Track Information
Type/No. of Tracks - MAIN/1
Gradient - DES. 0.40
Alignment - TANGENT

---Narrative---
UP FREIGHT TRAIN EXTRA 5055 WEST HAD 48 CARS DERAIL WHEN IT TRAVELED INTO THE PATH OF A TORNADO. THE TORNADO WAS IN A SEVERE RAIN AND HAIL STORM. THE ENGINEER WAS STOPPING THE TRAIN DUE TO ZERO VISIBILITY AND HIGH WINDS WHEN THE TORNADO STRUCK. FIVE HAZMAT TANK CARS DERAILED AND ONE LOADED WITH ANHYDROUS AMMONIA SUSTAINED A 4-FOOT PUNCTURE IN A TANK HEAD. ABOUT 15,000 GALLONS OF PRODUCT WAS SPILLED. MUCH OF IT POOLED IN A NEARBY DEPRESSION IN THE GROUND AND WAS LATER PICKED UP FOR DISPOSAL. AN EVACUATION OF ABOUT 200 PERSONS WAS IN EFFECT FOR 24 HOURS. THE TORNADO UPSET AN AUTOMOBILE IN THE VICINITY OF THE HAZMAT SPILL AND TWO OCCUPANTS WERE TREATED AT A LOCAL HOSPITAL FOR EYE AND LUNG IRRITATION.

File No. - 126 | 11/25/88 | FRUITVALE, TX | Time (Lcl) - 1915 CST

Occurrence #1 - ENCOUNTER WITH WEATHER
Phase - SLOWING

Finding(s)
1. WEATHER - TORNADO

Occurrence #2 - DERAILMENT
Phase - SLOWING

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
2. TANK CAR HEAD (A-END) - PUNCTURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1

Factor(s) relating to this accident is/are finding(s) 2

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ08 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 128 — 11/29/88 — PALMYRA, MO — Time (Lcl) - 0845 CST

---Basic Information---

Reporting Railroad - BN
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - LOADING/UNLOADING
Method of Operation - N/A

Property Losses
Railroad - $ 5,050.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	1	0

BN - BURLINGTON NORTHERN RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - BN
Type of Train - SINGLE CAR
Train ID - NONE
Direction - N/A
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 0
No. Cars/Caboose - 1/0
End of Train Monitor - NO
Length (Feet) - 65
Trailing Tons - 90
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - N/A

Crew Information
Front End - 1
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - NO
Operational - N/A

BN - BURLINGTON NORTHERN RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - NO

Itinerary
Last Departure Point
PALMYRA, MO

Destination
PALMYRA, MO

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - INDUSTRIAL/1
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
A MAINTENANCE HELPER EMPLOYED BY PALMYRA FERTILIZER CO. RECEIVED MINOR INJURIES WHILE GETTING A TANK CAR OF SULFURIC ACID READY FOR TRANS-LOADING TO A HIGHWAY TANK TRAILER TRUCK. THE WORKER UNSCREWED A RELIEF VALVE LOCATED INSIDE THE DOME OF THE TANK CAR. PRESSURE INSIDE THE TANK CAUSED THE METAL CAP TO FLY UP AND STRIKE HIS FACE, KNOCKING HIM BACK AGAINST THE PROTECTIVE RAILING. THE ACID BEGAN SPEWING OUT OF THE VALVE, GOING IN THE OPPOSITE DIRECTION FROM THE EMPLOYEE. ABOUT 500 GALLONS WERE LOST BEFORE THE PRESSURE WAS EQUALIZED. THE WORKER WAS TREATED AND RETURNED TO WORK THE SAME DAY. AMERICAN CYANAMID, LOCATED ADJACENT TO PALMYRA FERTILIZER, RESPONDED IMMEDIATELY WITH EQUIPMENT AND MEN. THEY BUILT DIKES, NEUTRALIZED THE AREA AND PICKED UP ALL RESIDUE WITH A VACUUM TRUCK.

File No. - 128 | 11/29/88 | PALMYRA, MO | Time (Lcl) - 0845 CST

Occurrence #1 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
1. RELIEF VALVE - OPEN
2. CARGO - PRESSURE EXCESSIVE
3. CARGO LOADING/UNLOADING - NOT UNDERSTOOD - OTHER MAINTENANCE PERSON

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 2, 3

Factor(s) relating to this accident is/are finding(s) 1

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # NYCR9FRZ03 — BRIEF OF ACCIDENT — RUNDATE: 12/21/90

File No. - 129 — 12/09/88 — EDISON, NJ — Time (Lcl) - 0455 EST

---Basic Information---

Reporting Railroad - CR
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - STANDING
Method of Operation - MANUAL BLOCKS

Property Losses
Railroad - $ 0.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	10

CR - CONSOLIDATED RAIL CORPORATION

---Railroad/Personnel Information---

Train Data
Railroad - CR
Type of Train - SINGLE CAR
Train ID - HOKX 8438
Direction - N/A
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 0
No. Cars/Caboose - 1/0
End of Train Monitor - NO
Length (Feet) - N/A
Trailing Tons - N/A
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - N/A

Crew Information
Front End - 0
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - NO
Operational - N/A

CR - CONSOLIDATED RAIL CORPORATION

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
EDISON, NJ

Destination
EDISON, NJ

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - SIDING/1
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
CHLORINE GAS WAS DETECTED LEAKING FROM THE JOINT BETWEEN THE MANWAY NOZZLE AND MANWAY COVER PLATE OF STANDING TANK CAR HOKX 8438 THAT WAS SUPPLYING CHLORINE TO A BUILDING IN AN INDUSTRIAL PLANT SITE ON A SIDETRACK OF CONRAIL. THE CHLORINE GAS HAD BEEN DETECTED BY AN INSPECTOR MAKING ROUTINE SAFETY CHECKS WITH A GAS DETECTOR. THE INSPECTOR SOUNDED THE PLANT'S EMERGENCY ALARM. THE CHEMICAL COMPANY ACTIVATED ITS EMERGENCY PLAN AND EVACUATED 10 EMPLOYEES FROM THE SITE. THE BOLTS FASTENING THE MANWAY NOZZLE TO THE MANWAY COVER PLATE WERE TORQUED TIGHTER AND SHORTLY AFTERWARD, NO GAS COULD BE DETECTED. THE TANK CAR HAD BEEN ON THE SIDING FOR 8 DAYS WITH NO LEAK DETECTED. DURING THAT TIME, THERE HAD BEEN SOME LARGE VARIATIONS IN TEMPERATURE.

File No. - 129 | 12/09/88 | EDISON, NJ | Time (Lcl) - 0455 EST

Occurrence #1 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
1. MANWAY - UNDERTORQUED
2. WEATHER - TEMPERATURE EXTREMES

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # LAX89FRZ05 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 130 — 12/14/88 — FLAGSTAFF, AZ — Time (Lcl) - 0135 MST

---Basic Information---

Reporting Railroad - ATSF
Type of Accident - DERAILMENT
Operating Phase - SWITCHING
Method of Operation - AUTOMATIC BLOCK TRAFFIC CONTROL

Property Losses
Railroad - $ 1,298,000.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - ATSF
Type of Train - FREIGHT
Train ID - EXTRA 5179 WEST
Direction - WEST
Speed (Est.) - 55
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 5
No. Cars/Caboose - 87/0
End of Train Monitor - MONITOR
Length (Feet) - 5363
Trailing Tons - 6792
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 21/26

Crew Information
Front End - 3
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
WINSLOW, AZ

Destination
LOS ANGELES, CA

Hazardous Materials
Involved - YES
Cars Involved - 6

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 1.42
Alignment - CURVE 5 D 9 M

---Narrative---
A RUNAWAY CUT OF 84 CARS HAD 26 OF THE CARS DERAIL WHEN THEY WENT AROUND A CURVE AT ABOUT 55 MPH, AFTER ROLLING FOR OVER 5 MILES. THE RUNAWAY TRAIN WAS PART OF ATSF FREIGHT TRAIN EXTRA 5179 WEST. THE CREW HAD STOPPED THE TRAIN ON A HILL TO SET OUT A CAR IN A SIDING. THE CREW HAD CLOSED THE ANGLECOCK ON THE END OF THE 84TH CAR, NEAREST TO THE LOCOMOTIVE, AFTER MAKING A 20-POUND AIR REDUCTION. THEY DID NOT SET ANY HANDBRAKES, INTENDING FOR THE AIRBRAKES TO HOLD THE 84 CARS UNTIL THEY HAD FINISHED SETTING OUT THE OTHER CAR. WHILE DISCUSSING THE SWITCHING MOVE, THE CREW LOOKED AROUND AND SAW THE CARS ROLL OUT OF SIGHT AROUND A CURVE. POST-ACCIDENT TESTING REVEALED THE BRAKES COULD RELEASE ON ALL 84 CARS IN LESS THAN 2 MINUTES. AMONG THE DERAILED CARS WERE 6 LOADED LPG TANK CARS. FOUR OF THEM WERE PUNCTURED AND RELEASED CARGO. 500 HUNDRED PERSONS WERE EVACUATED AND AN INTERSTATE HIGHWAY WAS CLOSED FOR ABOUT 56 HOURS.

File No. - 130 | 12/14/88 | FLAGSTAFF, AZ | Time (Lcl) - 0135 MST

Occurrence #1 - DERAILMENT
Phase - SETOUT NOT IN YARD

Finding(s)
1. HANDBRAKE - NOT APPLIED
2. CUT OF CARS - RELEASE AIR BRAKES
3. GENERAL RULES - DISREGARDED - ENTIRE TRAIN CREW
4. COMPANY-INDUCED PRESSURE - BRAKEMAN

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
5. TANK CAR(S) - PUNCTURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2, 3

Factor(s) relating to this accident is/are finding(s) 4, 5

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # LAX89FRZ13 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 146 — 01/28/89 — BONNERS FERRY, ID — Time (Lcl) - 0638 PST

---Basic Information---

Reporting Railroad - UP
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - STANDING
Method of Operation - YARD RULES
TIMETABLE

Property Losses
Railroad - $ 53,000.00
Non-Railroad - $ 50,000.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	3	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	1	1	12	483

UP - UNION PACIFIC RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - UP
Type of Train - LOCAL FREIGHT
Train ID - EXTRA 2017 EAST
Direction - EAST
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 2
No. Cars/Caboose - 40/1
End of Train Monitor - MARKER
Length (Feet) - 2248
Trailing Tons - 2755
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - N/A

Crew Information
Front End - 0
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

UP - UNION PACIFIC RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - DAWN

Evacuation - YES

Itinerary
Last Departure Point
EAST PORT, ID

Destination
SPOKANE, WA

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - YARD/10
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
UP LOCAL FREIGHT TRAIN EXTRA 2017 EAST ARRIVED IN BONNERS FERRY AT NIGHT WITH FREIGHT CARS FROM CANADA, AND WAS PLACED IN A SIDING. THE NEXT MORNING, LOCAL AUTHORITIES WERE NOTIFIED OF A FOG CLOUD AND STRONG ODORS IN THE RAIL YARD. INVESTIGATION REVEALED A HOLE HAD CORRODED THROUGH THE INNER SHELL OF A TANK CAR AND SULFUR DIOXIDE WAS LEAKING. ABOUT 500 PERSONS WERE EVACUATED FOR ABOUT 10 HOURS. 16 PERSONS WERE TREATED FOR INHALATION OF FUMES AND 1 PERSON HAD A FATAL CARDIAC ARREST DURING THE EVACUATION. THE NEXT DAY, THE CAR WAS RETURNED TO CANADA TO THE SHIPPER TO BE EMPTIED. OVER 20 TONS OF HAZMAT HAD VENTED TO THE ATMOSPHERE. THE CAR WAS LAST HYDROSTATICALLY TESTED IN MAY 1980, AND WAS DUE FOR TESTING IN MAY 1990. INSPECTION OF THE CAR'S INTERIOR REVEALED SEVERE CORROSION AT THE WELD LOCATIONS.

BRIEF OF ACCIDENT, continued

File No. - 146 | 01/28/89 | BONNERS FERRY, ID | Time (Lcl) - 0638 PST

Occurrence #1 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - STANDING

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
1. TANK SHELL - CORRODED
2. CARGO - LEAK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was: failure of the tank car shell due to corrosion of the seam weld areas.

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APPENDIX D

APPENDIX O

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # DCA89MR201B | BRIEF OF ACCIDENT | RUNDATE: 12/19/90

File No. - 147 | 02/02/89 | HELENA, MT | Time (Lcl) - 0430 MST

---Basic Information---

Reporting Railroad - MRL
Type of Accident - COLLISION,REAR-END
Operating Phase - STANDING
Method of Operation - AUTOMATIC BLOCK TIMETABLE

Property Losses
Railroad - $ 300,000.00
Non-Railroad - $ 0.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	2	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	3505

MRL - MONTANA RAIL LINK

---Railroad/Personnel Information---

Train Data
Railroad - MRL
Type of Train - LIGHT LOCOMOTIVE
Train ID - HELPER 1
Direction - EAST
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 3
No. Cars/Caboose - N/A
End of Train Monitor - NO
Length (Feet) - N/A
Trailing Tons - N/A
Loco. Destroy/Derailed - 0/1
Cars Destroy/Derailed - N/A

Crew Information
Front End - 2
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

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MRL - MONTANA RAIL LINK

---Environment/Operations Information---

Weather Data
Weather Condition - SNOW
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
HELENA, MT

Destination
HELENA, MT

Hazardous Materials
Involved - NO
Cars Involved - 0

Track Information
Type/No. of Tracks - MAIN/2
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
MRL FREIGHT TRAIN EXTRA 208 WEST HAD ALL 49 CARS IN THE TRAIN ROLL DOWN A MOUNTAIN GRADE AND STRIKE A STANDING HELPER LOCOMOTIVE CONSIST (HELPER 1), DERAILING 15 CARS OF TRAIN 208 AND 1 LOCOMOTIVE UNIT OF HELPER 1. THE LOCOMOTIVE CONSIST OF 208 INCLUDED THREE HELPER UNITS AND THREE ROAD UNITS, ALL ON THE HEAD END OF THE TRAIN. THE CREWMEMBERS OF 208 HAD UNCOUPLED THE LOCOMOTIVE UNITS FROM THE TRAIN TO REARRANGE THE LOCOMOTIVE CONSIST WHILE STOPPED ON A MOUNTAIN GRADE AND THE CARS THEN ROLLED AWAY. AMONG THE DERAILED CARS WERE 3 TANK CARS CONTAINING HYDROGEN PEROXIDE, ISOPROPYL ALCOHOL, AND ACETONE. HAZMAT RELEASED RESULTED IN A FIRE AND EXPLOSIONS. ABOUT 3,500 RESIDENTS OF HELENA WERE EVACUATED. TWO CREWMEMBERS OF HELPER 1 HAD MINOR INJURIES. THERE WAS EXTENSIVE DAMAGE TO PROPERTY. FOR A DETAILED REPORT OF THE ACCIDENT, SEE REPORT NTSB/RAR-89/05.

File No. - 147 | 02/02/89 | HELENA, MT | Time (Lcl) - 0430 MST

Occurrence #1 - LOSS OF CONTROL
Phase - STANDING

Finding(s)
1. TRAIN OPERATION - IMPROPER - CREW MEMBER OF OTHER TRAIN
2. BRAKES - NOT APPLIED
3. EXTRA TRAIN - NOT SECURED
4. TERRAIN CONDITION - DOWNHILL
5. JUDGMENT - POOR - ENGINEER OF OTHER TRAIN
6. WEATHER - TEMPERATURE EXTREMES
7. INADEQUATE TRAINING - EXECUTIVES AND OFFICIALS
8. INADEQUATE QUALIFICATION - COMPANY OPERATOR/MGMT

Occurrence #2 - DERAILMENT
Phase - STANDING

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
9. TANK CAR(S) - PUNCTURED
10. TANK CAR(S) - EXPLODED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was: the failure of the crew of Extra 208 West to properly secure their train by placing the train brakes in emergency and applying hand brakes when it was left standing unattended on a mountain grade. Contributing to the accident was the decision of the engineer of the helper in train 208 to rearrange the locomotive consist and leave the train unattended on the mountain grade, and the effects of the extreme cold weather on the airbrake system of the train and the crewmembers. Also contributing was the failure of the operating management of the Montana Rail Link to adequately assess the qualifications and training of employees placed in train service. Contributing to the severity of the accident was the release and ignition of hazardous materials.

APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # DCA89MR701A — BRIEF OF ACCIDENT — RUNDATE: 12/19/90

File No. - 147 — 02/02/89 — HELENA, MT — Time (Lcl) - 0430 MST

---Basic Information---

Reporting Railroad - MRL
Type of Accident - COLLISION,REAR-END
Operating Phase - EN ROUTE
Method of Operation - AUTOMATIC BLOCK TIMETABLE

Property Losses
Railroad - $ 2,580,000.00
Non-Railroad - $ 3,120,000.00

Fire - YES

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	5
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	2	3500

MRL - MONTANA RAIL LINK

---Railroad/Personnel Information---

Train Data
Railroad - MRL
Type of Train - FREIGHT
Train ID - EXTRA 208 WEST
Direction - WEST
Speed (Est.) - 20
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 6
No. Cars/Caboose - 49/0
End of Train Monitor - MONITOR
Length (Feet) - 2869
Trailing Tons - 4288
Locs. Destroy/Derailed - N/A
Cars Destroy/Derailed - 14/15

Crew Information
Front End - 5
Rear End - 0
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

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MRL - MONTANA RAIL LINK

---Environment/Operations Information---

Weather Data
Weather Condition - SNOW
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
HELENA, MT

Destination
MISSOULA, MT

Hazardous Materials
Involved - YES
Cars Involved - 6

Track Information
Type/No. of Tracks - MAIN/2
Gradient - LEVEL
Alignment - TANGENT

---Narrative---
MRL FREIGHT TRAIN EXTRA 208 WEST HAD ALL 49 CARS IN THE TRAIN ROLL DOWN A MOUNTAIN GRADE AND STRIKE A STANDING HELPER LOCOMOTIVE CONSIST (HELPER 1), DERAILING 15 CARS OF TRAIN 208 AND 1 LOCOMOTIVE UNIT OF HELPER 1. THE LOCOMOTIVE CONSIST OF 208 INCLUDED THREE HELPER UNITS AND THREE ROAD UNITS, ALL ON THE HEAD END OF THE TRAIN. THE CREWMEMBERS OF 208 HAD UNCOUPLED THE LOCOMOTIVE UNITS FROM THE TRAIN TO REARRANGE THE LOCOMOTIVE CONSIST WHILE STOPPED ON A MOUNTAIN GRADE AND THE CARS THEN ROLLED AWAY. AMONG THE DERAILED CARS WERE 3 TANK CARS CONTAINING HYDROGEN PEROXIDE, ISOPROPYL ALCOHOL, AND ACETONE. HAZMAT RELEASED RESULTED IN A FIRE AND EXPLOSIONS. ABOUT 3,500 RESIDENTS OF HELENA WERE EVACUATED. TWO CREWMEMBERS OF HELPER 1 HAD MINOR INJURIES. THERE WAS EXTENSIVE DAMAGE TO PROPERTY. FOR A DETAILED REPORT OF THE ACCIDENT, SEE REPORT NTSB/RAR-89/05.

File No. - 147 | 02/02/89 | HELENA, MT | Time (Lcl) - 0430 MST

Occurrence #1 - COLLISION, REAR
Phase - MAINTAINING SPEED

Finding(s)
1. TRAIN OPERATION - IMPROPER - ENTIRE TRAIN CREW
2. BRAKES - NOT APPLIED
3. EXTRA TRAIN - NOT SECURED
4. TERRAIN CONDITION - DOWNHILL
5. JUDGMENT - POOR - ROAD FREIGHT ENGINEER/MOTORMAN (through freight)
6. WEATHER - TEMPERATURE EXTREMES
7. INADEQUATE TRAINING - EXECUTIVES AND OFFICIALS
8. INADEQUATE QUALIFICATION - COMPANY OPERATOR/MGMT

Occurrence #2 - DERAILMENT
Phase - STOPPING

Occurrence #3 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
9. TANK CAR(S) - PUNCTURED
10. TANK CAR(S) - EXPLODED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was: the failure of the crew of Extra 208 West to properly secure their train by placing the train brakes in emergency and applying hand brakes when it was left standing unattended on a mountain grade. Contributing to the accident was the decision of the engineer of the helper in train 208 to rearrange the locomotive consist and leave the train unattended on the mountain grade, and the effects of the extreme cold weather on the airbrake system of the train and the crewmembers. Also contributing was the failure of the operating management of the Montana Rail Link to adequately assess the qualifications and training of employees placed in train service. Contributing to the severity of the accident was the release and ignition of hazardous materials.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ11 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 148 — 02/02/89 — KANSAS CITY, KS — Time (Lcl) - 1140 CST

---Basic Information---

Reporting Railroad - ATSF
Type of Accident - HAZ. MAT. RELEASED
Operating Phase - STANDING
Method of Operation - YARD RULES

Property Losses
Railroad - $ 500.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	4	0
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	0

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - ATSF
Type of Train - SINGLE CAR
Train ID - NONE
Direction - EAST
Speed (Est.) - 0
Speed (Auth.) - 0

Train Consist/Damage
No. Loco. Units - 0
No. Cars/Caboose - 1/0
End of Train Monitor - NO
Length (Feet) - N/A
Trailing Tons - N/A
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - N/A

Crew Information
Front End - 0
Rear End - 0
Toxicology Performed - NO

Radio Communications
Radio Available - NO
Operational - N/A

ATSF - ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLOUDY
Condition of Light - ARTIFICIAL ILLU

Itinerary
Last Departure Point
KANSAS CITY, KS

Destination
KANSAS CITY, KS

Hazardous Materials
Involved - YES
Cars Involved - 1

Track Information
Type/No. of Tracks - YARD/4
Gradient - LEVEL
Alignment - TANGENT

Evacuation - NO

---Narrative---
A TANK CAR LOADED WITH ACETIC ANHYDRIDE/ACETIC ACID HAD BEEN MOVED INTO AN ATSF REPAIR SHOP BUILDING TO REPAIR A BROKEN PIPE ON A COLD DAY. ABOUT AN HOUR LATER, THE CAR WARMED UP AND THE ACID STARTED LEAKING. FOUR CARMEN HAD MINOR INJURIES FROM INHALATION OF FUMES. THE CAR WAS RETURNED TO THE SHIPPER TO BE EMPTIED. INSPECTION OF THE CAR REVEALED A CLEARANCE OF 1-1/4 IN. BETWEEN THE BOTTOM OF THE EDUCTION PIPE AND THE SUMP. THERE WERE MARKS ON THE PIPE IN THE AREA OF THE PIPE GUIDE INDICATING THAT THE TANK BODY WAS FLEXING 1-3/8 INCHES IN TRANSIT, ALLOWING THE PIPE TO STRIKE THE SUMP. THIS ACTION RESULTED IN A SMALL CRACK DEVELOPING IN THE TANK.

BRIEF OF ACCIDENT, continued

File No. - 148 | 02/02/89 | KANSAS CITY, KS | Time (Lcl) - 1140 CST

Occurrence #1 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STANDING

Finding(s)
1. TANK SHELL - SHIFTED
2. TANK CAR(S) - PENETRATED
3. TANK SHELL - CRACKED
4. CARGO - LEAK

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was:
the eduction pipe striking the bottom of the tank, causing the tank to crack and leak.

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APPENDIX D

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # LAX89FRZ15 — BRIEF OF ACCIDENT — RUNDATE: 03/27/90

File No. - 157 — 02/20/89 — MANTECA, CA — Time (Lcl) - 0545 PST

---Basic Information---

Reporting Railroad - SP
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TRAFFIC CONTROL
TIMETABLE

Property Losses
Railroad - $ 1,097,460.00
Non-Railroad - $ 0.00
Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	3
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	0	150

SP - SOUTHERN PACIFIC TRANSPORTATION COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - SP
Type of Train - FREIGHT
Train ID - EXTRA 7502 WEST
Direction - WEST
Speed (Est.) - 50
Speed (Auth.) - 55

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 84/1
End of Train Monitor - NO
Length (Feet) - 4766
Trailing Tons - 5036
Loco. Destroy/Derailed - N/A
Cars Destroy/Derailed - 42/48

Crew Information
Front End - 2
Rear End - 1
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

SP - SOUTHERN PACIFIC TRANSPORTATION COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DARK ARTIFICIAL

Evacuation - YES

Itinerary
Last Departure Point
FRESNO, CA

Destination
OAKLAND, CA

Hazardous Materials
Involved - YES
Cars Involved - 2

Track Information
Type/No. of Tracks - MAIN/3
Gradient - DES. 0.22
Alignment - TANGENT

---Narrative---

SP FREIGHT TRAIN EXTRA 7502 WEST HAD 48 CARS DERAIL WHILE MOVING 50 MPH. TWO EMPTY TANK CARS WITH SOME HAZARDOUS MATERIAL RESIDUE WERE DERAILED. THERE WAS NO HAZMAT RELEASE, BUT LOCAL AUTHORITIES UNDERTOOK A PRECAUTIONARY EVACUATION WHICH INVOLVED APPROXIMATELY 150 PERSONS FOR OVER 12 HOURS. A BROKEN RAIL WAS FOUND AT THE INITIAL POINT OF DERAILMENT. AN EXAMINATION OF THE BROKEN PIECES REVEALED THE RAIL JOINT ASSEMBLY COMPONENTS HAD BEEN LOOSE AND NOT PROPERLY SUPPORTED FOR SOME TIME. THE JOINT COMPONENTS SHOWED SEVERE WEAR WHERE THE PARTS WERE IN CONTACT WITH EACH OTHER. THE RAIL JOINT SECTION WAS EXAMINED BY THE SP METALLURGICAL LABORATORY. FATIGUE CRACKS WERE FOUND IN THE BOLT HOLES ON EACH RAIL END, WHICH HAD RESULTED IN A HEAD AND WEB SEPARATION. THE TRACK WAS INSPECTED BY A TRACK INSPECTOR RIDING IN A HI-RAIL VEHICLE FOUR DAYS PRIOR TO THE DERAILMENT. NO DEFECTS WERE NOTED OR REPORTED DURING THE INSPECTION.

File No. - 157 | 02/20/89 | MANTECA, CA | Time (Lcl) - 0545 PST

Occurrence #1 - TRACK COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
1. RAIL JOINT(S) - NOT SUPPORTED
2. BOLT HOLE - CRACKED
3. RAIL HEAD - SEPARATION
4. TRACK MAINTENANCE - INADEQUATE - MAINTENANCE OF WAY INSPECTOR
5. TRACK INSPECTION - INADEQUATE - MAINTENANCE OF WAY INSPECTOR
6. INATTENTIVE - MAINTENANCE OF WAY INSPECTOR
7. INADEQUATE SURVEILLANCE OF OPERATION - COMPANY OPERATOR/MGMT

Occurrence #2 - DERAILMENT
Phase - MAINTAINING SPEED

Finding(s)
8. RAIL - BROKEN

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was: a broken rail due to inadequate track maintenance. Contributing to the accident was the inadequate track inspection made from a hi-rail vehicle.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # CHI89FRZ14 — BRIEF OF ACCIDENT — RUNDATE: 03/26/90

File No. - 158 — 02/20/89 — BORIDULAC, ND — Time (Lcl) - 0830 CST

---Basic Information---

Reporting Railroad - SOO
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TIMETABLE
TRACK WARRANT CONT

Property Losses
Railroad - $ 1,296,855.00
Non-Railroad - $ 0.00

Fire - NO

	Injuries			
	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	2	0

SOO - SOO LINE RAILROAD COMPANY

---Railroad/Personnel Information---

Train Data
Railroad - SOO
Type of Train - FREIGHT
Train ID - EXTRA 4514 EAST
Direction - EAST
Speed (Est.) - 40
Speed (Auth.) - 40

Train Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 76/1
End of Train Monitor - NO
Length (Feet) - 4881
Trailing Tons - 7894
Loco. Destroy/Derailed - 0/2
Cars Destroy/Derailed - 13/26

Crew Information
Front End - 2
Rear End - 2
Toxicology Performed - YES

Radio Communications
Radio Available - YES
Operational - YES

SOO - SOO LINE RAILROAD COMPANY

---Environment/Operations Information---

Weather Data
Weather Condition - CLEAR
Condition of Light - DAYLIGHT

Evacuation - YES

Itinerary
Last Departure Point
HARVEY, ND

Destination
ENDERLIN, ND

Hazardous Materials
Involved - YES
Cars Involved - 10

Track Information
Type/No. of Tracks - MAIN/2
Gradient - DES. 0.23
Alignment - TANGENT

---Narrative---
SOO FREIGHT TRAIN EXTRA 4514 EAST HAD 2 LOCOMOTIVE UNITS AND 26 CARS DERAIL WHILE MOVING OVER A SWITCH FROG AT 40 MPH. THE ENGINEER SAID THE LEAD LOCOMOTIVE RODE VERY ROUGH WHEN IT WENT OVER THE FROG. THE WING RAIL OF THE SWITCH FROG BROKE AT THE BOLT HOLES UNDER THE WEIGHT OF THE LOCOMOTIVES. THE FROG HAD 90 POUND RAIL MANUFACTURED IN 1945. TEN TANK CARS OF ANHYDROUS AMMONIA DERAILED, AND 4 OF THEM RUPTURED, SPILLING THE HAZMAT. THE SUDDEN RUPTURE PROJECTED 1 OF THE TANK CARS ABOUT 650 FEET AWAY. ABOUT 125 PERSONS WERE EVACUATED. TWO OF THEM RETURNED EARLY TO THEIR HOMES AND HAD TO BE HOSPITALIZED FOR INHALATION OF FUMES.

File No. - 158 | 02/20/89 | BORDULAC, ND | Time (Lcl) - 0830 CST

Occurrence #1 - DERAILMENT
Phase - MAINTAINING SPEED

Finding(s)
1. BOLT HOLE - BROKEN
2. SWITCH FROG - BROKEN

Occurrence #2 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
3. TANK CAR(S) - RUPTURED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident was: the failure of a wing rail in a switch frog which broke at the bolt holes.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

NTSB # DCA89MZ004 — BRIEF OF ACCIDENT — RUNDATE: 08/16/90
FILE NO. - 02/26/89 — AKRON, OH — Time (Lcl) - 1925 EST

---Base Information---

Reporting Railroad - CSX
Type of Accident - DERAILMENT
Operating Phase - EN ROUTE
Method of Operation - TIMETABLE
TRAIN ORDERS
CSX - CSX TRANSPORTATION, INC.

Property Losses
Railroad - $ 521,000.00
Non-Railroad-$[illegible]

Fire - Yes

Injuries

	Fatal	Serious	Minor	None
Employees	0	0	0	4
Passengers	0	0	0	0
Motorist	0	0	0	0
Other	0	0	55	0

---Railroad/Personnel Information---

Train Data
Railroad - CSX
Type of Train - FREIGHT
Train ID - D812-26
Direction - EAST
Speed (Est.) - 40
Speed (Auth.) - 40

Training Consist/Damage
No. Loco. Units - 4
No. Cars/Caboose - 49/2
End of Train Monitor - NONE
Length (Feet) - 3481
Trailing Tons - 6398
Loco. Destroy/Derailed - NONE
Cars Destroy/Derailed - 9/21

Crew Information
Front End - 2
Rear End - 2
Toxicology Performed - NO

Radio Communications
Radio Available - YES
Operational - YES

CSX - CSX TRANSPORTATION, INC.

---Environment/Operations Information---

Weather Data
Weather Condition - LIGHT SNOW
Condition of Light - DARK

Evacuation - YES

Itinerary
Last Departure Point
WILLARD, OH

Destination
AKRON, OH

Hazardous Materials
Involved - YES
Cars Involved - 9

Track Information
Type/No. of Tracks - MAIN/2
Gradien - LEVEL
Alignment - CURVE 1 D 30 M

---Narrative---
CSX FREIGHT TRAIN D812-26 ORGINATING AT WILLARD, OH AND TRAVELLING AT 40 MPH DERAILED NEAR FINAL DESTINATION OF AKRON, OH. AT TIME OF DERAILMENT THE TRAIN CONSISTED OF 4 LOCOMOTIVES AND 51 CARS. THE 10TH THROUGH 30TH CAR IN CONSIST DERAILED; THE 18TH THROUGH 26TH CARS CONTAINED BUTANE, A FLAMMABLE LIQUID, 4 OF WHICH LOST PRODUCT. THE ACCIDENT OCCURRED NEAR A B.F. GOODRICH PLANT. THE PLANT AND ADJACENT RESIDENTIAL AND BUSINESS AREAS WERE EVACUATED SHORTLY AFTER DERAILMENT. FIRES CONTINUED TO BURN FOR SEVERAL DAYS.

BRIEF OF ACCIDENT, continued

File No. - 02/26/89 AKRON, OH Time (Lcl) - 1925EST

Occurrence #1 TRACK COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - UNKNOWN

Finding(s)
1. ALIGNMENT - IRREGULAR

Occurrence #2 - TRAIN COMPONENT SYSTEM/FAILURE/MALFUNCTION
Phase - MAINTAINING SPEED

Finding(s)
2. CAR - MECHANICAL DEFECT

Occurrence #3 - DERAILMENT
Phase - MAINTAINING SPEED

Findings(s)
3. RAIL, CONTINUOUSLLY WELDED - DEFECT, INTERNAL

Occurrence #4 - FIRE/EXPLOSION
Phase - STOPPING

Occurrence #5 - HAZARDOUS MATERIALS LEAK/SPILL (FUMES/SMOKE)
Phase - STOPPING

Finding(s)
4. TANK SHELL - RUPTURED
5. TOP FITTINGS - DAMAGED

---Probable Cause---

The National Transportation Safety Board determines that the probable Cause(s) of this accident is/are finding(s) 1, 2

APPENDIX E

PROVISIONS OF THE HAZARDOUS MATERIALS TRANSPORTATION UNIFORM SAFETY ACT APPLICABLE TO RAIL SAFETY

The Hazardous Materials Transportation Uniform Safety Act (Public Law 101-615, signed into law in November 1990) is a comprehensive amendment and expansion of the Hazardous Materials Transportation Act. Major provisions of the new Act that are applicable to rail safety include (1) registration of shippers and carriers of hazardous materials, (2) training of emergency response personnel, (3) training of employees who handle hazardous materials, (4) requirements for studies on a hazardous materials database, (5) the rail tank car design process and criteria, and (6) requirements that certain high-risk materials cannot be transported in rail tank cars manufactured before January 1, 1971, unless a retrofit of air brake support attachments has been completed. Details of the provisions related to the issues addressed in this safety study follow:

- The Act provides grants to States for training emergency response personnel. (The grants are to be funded by registration fees collected from companies shipping certain types of hazardous materials.)

- The Act requires the DOT Secretary to complete rulemaking within 18 months to establish standards for training appropriate employees in the safe loading, unloading, handling, and transportation of hazardous materials; and in the emergency preparedness for responding to accidents or incidents involving the transportation of hazardous materials.

- The Act recognizes that the risks posed by the transportation of hazardous materials requires a well-trained network of local and State emergency response personnel.

- The Act requires the DOT Secretary to complete in 1 year a railroad tank car study that evaluates the design process and criteria for tank cars, including whether head shields should be installed on all tank car tanks that carry hazardous materials.

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APPENDIX F

FEDERAL RULEMAKING AND SAFETY BOARD COMMENTS RELATED TO DOCKET HM-181

The final rule issued by the RSPA on December 21, 1990 (55 FR 52402-52729), which becomes effective on October 1, 1991, is a revision of the Hazardous Materials Regulations (49 CFR Parts 171-179). According to the RSPA, Docket HM-181 was initiated to streamline and to improve the packaging standards for hazardous materials. The RSPA identified five reasons for revising the packaging standards: (1) to simplify and reduce the volume of hazardous materials regulations; (2) to enhance safety through better classification and packaging; (3) to promote flexibility and technological innovation in packaging; (4) to reduce the need for exemptions in the Hazardous Materials Regulations; and (5) to facilitate international commerce.

Earlier in the rulemaking process for Docket HM-181, the RSPA issued a Notice of Proposed Rulemaking (NPRM). In comments responding to the NPRM, the Safety Board expressed concerns related to the types of products that would be permitted in tank cars without certain safety features. (The Safety Board's comments, dated March 1, 1988, are presented on the following pages.) Before issuing the final rule for Docket HM-181, the RSPA and FRA shifted portions of the content from Docket HM-181 to Docket HM-175A, which addresses tank head and thermal protection, safety release valves, tank closures, and "grandfathering." (Docket HM-175A is discussed in appendix G.) Consequently, the portions on which the Safety Board provided comments were incorporated into Docket HM-175A. The final rule for Docket HM-175A has not yet been issued; therefore, the Safety Board does not know if its concerns related to packaging will be addressed.

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National Transportation Safety Board

Washington, D.C. 20594

March 1, 1988

Dockets Branch
Research and Special Programs
Administration
U.S. Department of Transportation
400 Seventh Street SW
Washington, D.C. 20590

Dear Sir:

The Safety Board has reviewed your Notice of Proposed Rulemaking (NPRM), "Performance-Oriented Packaging Standards; Miscellaneous Proposals," Docket No. HM-181, which was published at 52 FR 16482 on May 5, 1987, and the revised NPRM which was published at 52 FR 42773 on November 6, 1987. We support the objectives stated in this rulemaking, that is, to simplify the hazardous materials regulations, to reduce the volume of regulations, to promote flexibility and technological advances in packaging, to promote safety through better packaging, to reduce the need for exemptions, and to facilitate international commerce.

Although it has taken 5 years for the RSPA to progress this rulemaking to an NPRM, we are pleased that the RSPA has taken action to improve the hazard classification system through quantitative definitions and to establish performance-oriented nonbulk packaging criteria. We note that the proposal still contains some inconsistent packaging requirements in the proposed regulations and that it fails to adequately address the advance notice of proposed rulemaking (ANPRM) comments on nonbulk package performance tests involving differences in the United States and European transportation environments.

The Safety Board also notes that several previously prohibited poisonous gases, e.g., phosgene, germane, and cyanogen chloride, will be permitted to be transported in bulk containers; yet, no justification has been offered for this change. We do not believe that previously prohibited gases should be transported in bulk containers unless tests and safety analyses document that this change will not unreasonably affect public safety. Nevertheless, the Board believes the NPRM contains significant improvements for the transportation of hazardous materials. Below are specific comments which we believe will help to further the stated objectives of this rulemaking.

Hazard Classification

On numerous occasions, the Safety Board has expressed concern about the deficiencies in the Department of Transportation (DOT) hazard identification and classification system. We have urged the DOT to fully identify the hazards posed to life and health by each material during normal transportation and emergencies. Additionally, the Safety Board has recommended specific improvements in this system. (See Safety Recommendations R-72-44, I-76-3, I-81-14, I-81-15, and I-81-16.) The Safety Board continues to believe that improved knowledge about the type and extent of hazards posed by materials is necessary for making correct regulatory and design decisions about the level of protection containers should be required to provide during transportation. Additionally, this more comprehensive information should influence

public safety protection measures implemented when such materials are released during transportation. Therefore, we support RSPA's actions in the NPRM to provide quantitative definitions for all classes of hazardous materials and to make those definitions consistent with the recommendations prescribed by the United Nations (UN). We believe the proposed definitions will result in an improved and more uniform system for identifying the hazard characteristics of materials in transportation.

Hazard Communication

Many transported materials exhibit multiple hazards; however, the proposed regulations do not adequately address subsidiary hazards. Subsidiary hazards should be identified in the hazardous materials table (Section 172.101), on shipping papers (as required in Canada), and on vehicles. For example, according to the precedence of the hazard table in Section 173.2a, a material that requires a packaging group I container because of its toxicity by inhalation and because of its flammability (class 3) would be classified as a poisonous material. This classification results in only the poisonous characteristics of the material being identified. The potentially equally important information on its flammability characteristics will not be disclosed on shipping papers or placards.

Also, the Safety Board is concerned that the proposed use of hazard class or division numbers and identification numbers on shipping papers, labels, and placards as the required means of identifying materials and their hazards does not effectively convey sufficient warning information to the general public. The Safety Board believes that the DOT must require all shipping papers, labels, and placards to identify in plain language the hazards of the material for domestic shipments. Any additional information, such as class or division numbers and identification numbers, should supplement rather than replace text to identify the hazards.

First, numbers require persons to be familiar with the "code," or to have references readily available to explain their meaning. Secondly, numbers can be confusing when cargo names are complicated and contain numbers themselves. For example, the cargo 3,3,6.5.9,9-Hexamethyl-1,1,2,4,5-tetracyclononane is a proper DOT shipping name with identification number UN2167. Under current requirements, the hazard class described on the shipping papers is "Organic Peroxide." Under the proposed requirements, the hazard class would be described as "5.2." During an emergency, such a multitude of numbers may easily result in confusion for emergency responders, who face very stressful situations and need very clear information.

A priority objective of this rulemaking should be to verify that the hazard warning system is capable of alerting the general public and emergency responders to the hazards of each material transported. The Safety Board has previously pointed out in recommendations to the DOT, and the DOT has agreed, that the context of the hazard warning information system should be readily intelligible to all concerned, especially to those individuals having emergency action responsibilities. We also have called upon the DOT to carefully review its hazard warning system to insure that warnings of impending danger and advice are given in an understandable manner to the general public. Since 1968, the Safety Board has made several additional recommendations concerning modification of the hazard warning system, and the DOT has implemented appropriate changes. Consequently, the Safety Board is not convinced that the present warning system should be abandoned.

APPENDIX F

The Safety Board recognizes that the use of numbers is appropriate for international shipments where a cargo may pass through several countries, each with a different language. However, this situation does not exist for domestic shipments. Therefore, the DOT should require the use of the type of warning system which is capable of alerting the majority of those affected by the transport of hazardous materials. Hazard warning and material identification are most easily communicated with words rather than numbers. The Safety Board does not believe that the proposed numeric system accomplishes this objective.

Another concern is the DOT's creation of a numeric code, "10," in column 7 of the hazardous materials table to identify when packages containing specific hazardous materials must be marked "INHALATION HAZARD." Rather than clearly stating that the package must be marked "INHALATION HAZARD," the code "10" special provision states that bulk and nonbulk peckagings shall be marked in accordance with Subpart D of Part 172. Subpart D of Part 172 then references requirements in Section 172.313, thus making it necessary for the user of these regulations to piece together several provisions to determine that a package must be marked "INHALATION HAZARD." The DOT has the capability to identify those materials in its hazardous materials table which meet the criteria established for identifying materials that pose toxic inhalation hazards. Therefore, to make compliance with its regulations easier, the Safety Board encourages the DOT to identify those materials listed in its hazardous materials table that must be marked "INHALATION HAZARD" and then to identify those materials by placing the code "10" in column 7 on the same line as the listed material.

The proposed changes would require that if a material is described by a "not otherwise specified" (n.o.s.) entry in the 172.101 table, the technical name of the material shall be entered in parentheses immediately following the proper shipping name. If the material is a mixture of two or more hazardous materials, the DOT, without justification, has proposed that the names of only the two components most predominately contributing to the hazard(s) of the mixture shall be entered in parentheses. The Safety Board believes that all components of an n.o.s. entry which contribute to the hazard(s) of the mixture should be entered on the shipping paper and sees no justification, based on safety, to limiting the entry to two components.

The need for complete information on the materials contained in waste shipments was illustrated by an accident on March 6, 1984, in Orange County, Florida, which involved a cargo tank of mixed hazardous waste acids described as waste acid liquid, n.o.s. Twelve persons who came in contact with the vapors were injured, four seriously. Based on its investigation of the accident, the Safety Board recommended that the RSPA :

I-85-10

Determine the adequacy of general shipping names on shipping papers for hazardous wastes and the need for additional information, such as technical and chemical group names, to better inform emergency response personnel about the composition and hazard of the material being shipped.

The Safety Board concluded that contributing to the accident was a "lack of information available to emergency response personnel from shipping papers, the shipper, and the carrier about the composition and hazards of the waste material." The Safety Board urges the RSPA to accomplish the safety objectives of Safety Recommendation I-85-10 in the final regulations.

Packaging Requirements

Performance Standards.--While the Safety Board supports and has previously urged the DOT to develop performance-oriented packaging standards, it is essential that any increased flexibility in the design for packagings be accompanied by increased responsibility for proving the adequacy of a packaging. Such proof must include, as a minimum, packaging tests that demonstrate that acceptable levels of safety performance will be experienced during conditions normally incident to transportation, including conditions experienced during accidents. The proposed general requirements for testing nonspecification packagings (49 CFR 178.601) state that the test procedures prescribed are intended to ensure that packages containing hazardous materials can withstand normal conditions of transportation; yet, the proposed tests are insufficient for demonstrating how packages will perform when subjected to stresses in the actual transportation environment, i.e., extended periods of vibration, abrasion, puncture, extreme temperature, and accident conditions.

Some of the proposed test acceptance criteria prescribed for performance-oriented nonbulk packages actually are less severe than the acceptance criteria presently required for specification packages. This rulemaking fails to justify or to otherwise demonstrate the adequacy of the proposed test requirements for providing an appropriate margin of safety. For example, when phosphoric acid is transported in a drum under current regulations, the drum must pass a leakproofness test at 15 psig. Under the proposal, however, that same material may be shipped in a drum that passes a leakproofness test at only 2.9 psig. The effect of this reduction on transportation safety is not defined. On the other hand, some proposed tests, such as the hydrostatic and drop tests, have incorporated improved testing procedures by requiring in the prescribed test procedures consideration of the physical characteristics of hazardous materials, such as vapor pressure and specific gravity. Those changes should help to better determine if specific packages will properly retain dangerous materials. Nevertheless, we are concerned that an appropriate safety analysis has not been performed to demonstrate that the proposed package performance tests and acceptance criteria will achieve acceptable levels of safety.

While the proposed package performance test standards generally follow the UN-recommended performance test standards, the rulemaking does not adequately address the relevancy of the UN-recommended tests to the U.S. transportation environment. The NPRM notes that a number of comments in the ANPRM questioned the applicability of UN standards in the United States. The transportation environment conditions in the United States can vary significantly from conditions in Europe, e.g., 50 or more hours of continuous package vibration is not unusual in the United States, whereas such continuous vibration would be unlikely in Europe. Furthermore, the NPRM notes that a number of comments in the ANPRM believe that vibration places abrasion and fatigue stresses on packages. Therefore, a package may prove to be unsatisfactory in spite of its ability to survive a drop test. As a result of those concerns expressed in the ANPRM, the NPRM contains a requirement in Section 173.24a that each nonbulk package be capable of withstanding a vibration test. However, the proposed vibration test is for a period of only 1 hour, and the proposed regulation does not explicitly require that the vibration test prescribed in appendix C be performed. Additionally, no other tests have been added to address abrasion, fatigue, or puncture stresses experienced in the U.S. transportation environment. Therefore, the Safety Board does not believe that the tests, as now proposed, adequately address the comments to the

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ANPRM on the suitability and acceptability of the UN performance test standards when applied to the transportation environment in the United States as compared to Europe.

During a public hearing held November 17-18, 1987, several participants again questioned the suitability and adequacy of the proposed test standards for evaluating the safe performance of packagings for the U.S. transportation environment. The chairman of the board of directors of the National Barrel and Drum Association (NABADA), a trade association representing the container reconditioning industry, expressed the following concerns:

> The vibration test is too inadequate to have any relevance to steel drums and the real transportation environment; hydrostatic pressure test requirements will often be lower than current requirements; and, leak test pressures are proposed to be reduced by more than 70 percent for new containers in Packaging Group I and more than 58 percent for Packaging Group II.
>
> Five years ago, when commenting on the ANPRM, the association urged the "immediate initiation of comprehensive technical research to correlate performance standards with actual conditions encountered in U.S. transportation . . . unfortunately nothing was done. Technically, NABADA is in no position to suggest what additional performance tests might be developed to assure greater container strength to resist puncture, abrasion, and real transportation vibration (not 1 hour, but 30, 40, or even 50 hours)."

The General Counsel to the Conference on Safe Transportation of Hazardous Articles, Inc., expressed the following concerns:

> In larger packaging, . . . particularly 55-gallon drums, the UN recommendations appear to be inadequate. A packaging which meets the UN performance tests alone will not function dependably in real transportation, especially on the extensive American highway and rail systems. Many drums used today in Europe are satisfactory, but it is unclear to what extent (if at all) the European community has implemented pure UN standards and phased out other specifications. It also is unclear to what extent existing European quality results from supplemental requirements imposed by governmental testing agencies, above and beyond basic UN criteria.
>
> While all the rigid detail of today's specifications may not be necessary, until there is development of a performance standard that truly measures the transportation strength of a packaging, some elements of today's design standards should be retained. Minimum strength and thickness of materials of construction are among these elements.

The Safety Board also questions the practicality of proposed specific package minimum thickness requirements for reuse packages while no minimum thickness requirements are proposed for most of those same new packages. Before any package, new or used, is permitted to be used to transport any hazardous material, it first should be demonstrated that the package will pass all packaging performance tests. The Safety Board believes it is important that these matters be evaluated before nonbulk,

performance-oriented packaging requirements are permitted to replace specific packaging standards.

Hazardous Wastes Packaging.--The proposed regulations will permit, without further qualification, the transportation of hazardous wastes in used packages even though they may not be considered reusable for nonwaste hazardous materials. Section 173.12(c) states that "A packaging which is non-reusable according to the specification requirements of Part 178 of this subchapter or to 173.28 of this Part may be reused for the shipment of hazardous waste to designated facilities" if the "package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage and is found to be free from leaks immediately prior to being offered for transportation." The Safety Board believes that package safeguard requirements should not depend on whether a material is intended for commercial use or waste disposal. Rather, the transportation safety requirements of a material should depend on its hazard characteristics during transportation. Containers that are too thin or otherwise would fail to pass reuse performance requirements for shipments of hazardous materials also should be prohibited for wastes which possess equivalent or worse hazard characteristics. In 1985, in the supplementary information to Docket HM-183, the RSPA acknowledged "that there is no significant difference in the risks associated with the transportation of hazardous wastes and other types of hazardous materials." The Safety Board agrees that many wastes pose no less of a hazard than pure materials. However, some waste solutions, such as mixtures of hydrochloric acid and nitric acid, result in a more reactive solution than the individual pure materials. Consequently, we believe that packagings for waste materials at least should meet the same standards of performance as that required for other hazardous materials.

Bulk Packaging.--While the proposed hazard classification and identification system will group materials with like hazard characteristics more uniformly, bulk packaging safety requirements (for highway cargo tanks and rail tank cars) are sometimes inconsistent between commodities within the same hazard classification group with no apparent justification. For example, the Safety Board identified 14 poisonous gases (2.3) (including chloropicrin and methyl chloride mixtures, methyl bromine, and nitric oxide) which require packaging group I nonbulk packagings and which may be transported in cargo tanks under the current regulations. We also identified 21 other poisonous gases which require packaging group I nonbulk packagings but which may not be transported in bulk highway cargo tanks unless specifically approved by the Director, Office of Hazardous Materials Transportation (OHMT). Those materials include arsine, hydrogen selenide anhydrous, and nitrogen dioxide, liquefied. Additionally, we identified four poisonous gases which may be shipped in less stringent packaging group II nonbulk packagings but are prohibited from being transported in bulk highway cargo tanks under the proposed regulations. These include boron trifluoride, coal gas, nitrosyl chloride, and tetraethyl dithiopyrophosphate and gases in solution or with gas mixtures LC 50 $\leq$ 200 ppm.

The Safety Board also has found inconsistent requirements for bulk shipments of hazardous materials in tank cars which would result in a reduced level of safety. Section 173.314(b)(6) provides grandfather protection for tank cars built before December 30, 1971, that are used to transport flammable gases (2.1). Such tank cars would not be required to have heat-resistant gaskets for manway covers and mounting for fittings. The proposed regulation would require that tank cars manufactured after December 30, 1971, have gaskets made of heat-resistant materials approved by the Association of American Railways (AAR) Tank Car Committee; yet, the AAR has not

developed standards for gasket materials. Additionally, there are still exceptions to the regulations that permit tank cars with a capacity of 18,500 or less gallons to be used for transporting flammable gas when those tank cars do not provide equal levels of protection required for larger cars, i.e, head shields and thermal insulation. As yet, the DOT has not provided any justification for this exception. The Safety Board believes that it is time to stop permitting tank cars that fail to meet current minimum safety requirements to be used to transport dangerous materials under "grandfather clauses." As a minimum, the DOT should establish a specific date by which all tank cars would have to comply with the new requirements.

While the DOT is attempting in its rulemaking to strengthen the packaging requirements for liquids and gases which pose toxic-by-inhalation hazards, the Safety Board is concerned that the use of J-type tank cars, which are equipped with large volume pressure relief valves, may not be appropriate for transporting toxic materials since these materials should not be released to the atmosphere. Furthermore, the requirements for using J-type (tanks equipped with protection against head puncture and thermal exposure) or S-type (tanks equipped with protection against head puncture only) tank cars seem to be arbitrary as materials with equivalent hazards sometimes are assigned to J-type tank cars and sometimes to S-type tank cars.

About 30 materials previously prohibited from being transported in bulk, such as phosgene, now are permitted. However, all such previously prohibited materials are not proposed to be transported in packagings that provide the greatest protection during transportation accidents. Before these materials are permitted to be transported in bulk, the DOT must demonstrate that all proposed packagings will be constructed to minimize the risk of any release during transportation, including the elimination of exceptions which permit hazardous materials to be transported in packagings that do not meet all safety requirements. Any materials believed to pose a risk so great that no release from packagings during transportation could be considered acceptable, especially in bulk quantities, should be subject to rigorous performance tests that demonstrate the integrity of the container through severe accident conditions. such as tests currently performed on some radioactive materials packagings.

This rulemaking proposal does not address the need of requiring the use of tank cars protected by head shields and thermal insulation for transporting all materials with an isolation radius of 1/2 mile or more as specified in the DOT's Emergency Response Guidebook. (See Safety Recommendation R-85-105.) Any material, when packaged in rail tank cars, which is so hazardous as to warrant large public evacuations during emergencies also should warrant protection from release or violent rupture of its container. The Safety Board urges the RSPA to incorporate requirements into the final rule appropriate to accomplish this safety objective.

In summary, the Safety Board believes that this proposal, on the whole, is a substantial improvement and, therefore, we support adoption of most of the proposed changes. However, the proposal contains certain deficiencies which the Safety Board believes must be rectified before all aspects of the proposed rule are made final. We believe that the following corrective actions can be taken without causing any appreciable delay in the implementation schedule:

> Identify in the hazardous materials table and require the identification on shipping papers and on transportation vehicles the known subsidiary hazards of materials transported.

Maintain for domestic shipments the presently required hazard warning information on shipping papers, labels, and placards for communicating, in plain language, the hazards posed by materials. The U.N. hazard class number also could be used, but it should not replace the present hazard warning system.

Use proposed code "10" in the hazardous materials table as a positive means for denoting materials which must be marked "INHALATION HAZARD."

Require that all components of a waste or mixed material which contribute to the hazards of the material be entered on the shipping paper.

Require that packaging standards for waste materials meet the same standards as nonwaste materials which pose equivalent hazards.

Establish a specific date by which the "grandfather clauses" no longer permit hazardous materials to be transported in railroad tank cars that do not meet present safety requirements.

Require that railroad tank cars used to transport materials with a DOT Emergency Response Guidebook recommended evacuation radius of 1/2 mile or more be equipped with head shield protection and, as applicable, with thermal insulation.

Establish or adopt an existing performance standard for heat-resistant gaskets that are required for tank car manway covers and for mountings for fitting.

Based on an evaluation of the product characteristics of liquids and gases which pose toxic-by-inhalation hazards, modify the proposed tank car packaging assignments to require the use of appropriate tank car head puncture and thermal protection for materials that pose equivalent hazards.

The Safety Board recognizes that the following improvements, called for in its comments above, will require additional study and/or research and thus cannot be done expeditiously:

Conduct tests and perform appropriate safety analyses to determine whether the proposed nonbulk, performance packaging standards provide adequate protection against vibration, abrasion, puncture, extreme temperature, and accident conditions for the U.S. transportation environment.

Conduct tests and perform appropriate safety analyses to identify the risks posed and to demonstrate the containment capability of packagings proposed for transporting materials previously prohibited from transportation in bulk.

For the two above instances, the Safety Board believes that the RSPA should proceed with a final rule which leaves the present requirements in place in lieu of the relaxed

standards contained in the proposal. At a later date, when the RSPA has completed the necessary testing and has analyzed the results, a supplementary rulemaking based on its findings then could be issued. In the interim, this more conservative approach will provide greater protection for the public.

The Safety Board appreciates the opportunity to make these comments and urges RSPA to move expeditiously on this rulemaking.

Respectfully yours,

Jim Burnett
Chairman

APPENDIX G

FEDERAL RULEMAKING AND SAFETY BOARD COMMENTS RELATED TO DOCKET HM-175A

An advance NPRM (ANPRM), "Specifications for Tank Car Tanks," was issued on May 15, 1990 (55 FR 20242-20245). According to the RSPA, this rulemaking action (Docket HM-175A) was initiated (1) to require thermal protection or head protection, or both, on new and existing tank car tanks that are constructed of aluminum or nickel, or that are used to transport certain hazardous materials; (2) to disallow the use of the half-head shield as an option to meet head protection requirements; (3) to prohibit the use of tank car tanks that have a manway cover located below the liquid level of the product being transported; (4) to disallow the use of so-called non-pressure tank car tanks to transport materials that are poisonous by inhalation; (5) to increase the start-to-discharge pressure setting on certain tank car tanks; (6) to establish specifications for the securement and accident survivability of tank closure fittings on tank cars; and (7) to phase out certain "grandfather" provisions for tank car tanks that do not meet the safety requirements for newly built tank car tanks.

The Safety Board's comments responding to the ANPRM identified the needs listed below. (The full text of the Safety Board's comments, dated August 21, 1990, is presented on the following pages.)

- The RSPA should expedite final rules that would require full head shields and thermal protection for all tank cars transporting Class A poisons; materials that are toxic by inhalation; and specialty products such as high-strength acids, chlorine, oxidizers, and other materials that are extremely reactive.

- The RSPA should not permit tank cars that fail to meet current minimum safety requirements to be used to transport dangerous materials under "grandfather clauses."

- The RSPA should prohibit the transportation of hazardous materials within the United States in any tank cars with bottom manway openings.

- The RSPA should develop and implement, with the assistance of the FRA, regulations to address the integrity of closure fittings, including, at a minimum, requirements for torque settings and gasket specifications that would ensure that liquid and vapor-tight seals are attained when the fittings are mounted

and secured and improved testing in positions other than the vertical to determine if these fittings can prevent the release of the hazardous material being transported.

The RSPA received comments from about 25 other organizations and individuals by the closing date of the comment period (August 21, 1990). The agency is now reviewing all comments before issuing the NPRM, which is expected to occur in the summer 1991.

APPENDIX G

National Transportation Safety Board

Washington, D.C. 20594

August 21, 1990

Office of the Chairman

Dockets Branch
Research and Special Programs Administration
U.S. Department of Transportation
400 Seventh Street S.W.
Washington, D.C. 20590

Dear Sir:

The National Transportation Safety Board has reviewed the Advanced Notice of Proposed Rulemaking (ANPRM) "Specifications for Tank Car Tanks," Docket No. HM-175A, Notice No. 90-8, which was published by the Research and Special Programs Administration (RSPA) of the U.S. Department of Transportation (DOT) at 55 FR 20242 on May 15, 1990. The Safety Board offers the comments below for your consideration.

Tank Head and Thermal Protection

Since the late 1960s, the Safety Board has conducted numerous investigations of accidents in which tank cars sustained head-end punctures, leading to a release of the hazardous materials being transported. As a result of its investigations, the Safety Board has repeatedly recommended that full head shields and thermal protection be required for tank cars transporting high risk hazardous materials.

In response to these accidents and the Safety Board's recommendations, RSPA issued regulations between September 1977 and January 1984 that required:

1. Head shield and thermal protection on existing and newly built DOT specification 112 and 114 tank cars transporting flammable gases (1977);

2. Head shield protection on existing and newly built DOT specification 112 and 114 tank cars transporting anhydrous ammonia (1977);

3. Vertical restraint couplers on all new and existing specification 112 and 114 tank cars (1977);

4. Vertical restraint couplers on existing and newly built specification 105 tank cars and all other DOT specification tank cars (1981);

5. Tank head puncture resistance systems on specification 105 tank cars built after August 31, 1981, and used to transport flammable gases, anhydrous ammonia, and ethylene oxide (1981); and

6. Lower tank head protection on specification 105 tank cars built before September 1, 1981, and that had a capacity exceeding 18,500 gallons and were used to transport a flammable gas or ethylene oxide (1984).

Since 1984, RSPA has not broadened the requirements for head shield protection despite the issuance of additional recommendations and the occurrence of additional accidents in which tank cars transporting hazardous materials sustained head-end punctures. For example, on March 12, 1980, the Safety Board issued Safety Recommendation R-80-12, which recommended that DOT examine specialty products (such as high strength acids, chlorine, and oxidizers), and class A poisons that were being shipped in specification 111 tank cars to determine if the toxicity hazard was sufficient to justify head shields and thermal protection. The Safety Board is also concerned with the transportation of materials that are toxic by inhalation. Because these materials should not be released to the atmosphere, they should be afforded the protection provided by full head shields and thermal protection when transported in rail tank cars.

As a result of its investigation of the head-end puncture of an aluminum DOT specification 111A tank car and the release of fuming nitric acid in Denver, Colorado, on April 3, 1983, the Safety Board concluded that the puncture occurred at an impact speed of only 12 miles per hour and that head shields may have prevented the release of the product. As a result of this accident, the Safety Board issued Safety Recommendation R-85-61, which, in part, called upon RSPA to require the installation of head shields on DOT specification aluminum tank cars to protect them from punctures.

On February 23, 1985, eight tank cars that were transporting cyclohexane, a flammable liquid, derailed in Jackson, South Carolina. The heads of five of the eight tank cars were punctured, permitting the release and ignition of the cyclohexane. The tank cars were equipped with vertical restraint couplers but were not equipped with head shields. The Safety Board concluded that the punctures of the tank heads probably would not have occurred if the tank cars had been equipped with head shields.

More recent accidents in Helena, Montana, Freeland, Michigan, and Akron, Ohio, all involved tank cars that sustained impacts on the tank heads. On February 2, 1989, a run-away freight train collided with yard locomotives in Helena, Montana. As a result of the collision, a DOT specification 111A dual compartment tank car transporting acetone and isopropyl alcohol was punctured in the tank head resulting in the release of 12,000 gallons of isopropyl alcohol. The tank car was not equipped with head shields. The Safety Board concluded that the puncture would not have occurred if the tank car had been so equipped.

On July 22, 1989, a derailment in Freeland, Michigan, resulted in head-end punctures to a DOT specification 105A tank car transporting trimethychlorosilane and a DOT specification 111A tank car transporting petroleum naphtha. A third tank car, a DOT specification 112A containing acrylonitrile, was not punctured, but one tank head sustained severe damage

in the accident. None of these three tank cars were equipped with head shields nor were they required to be so equipped for the products carried.

On February 26, 1989, twenty-one cars derailed in Akron, Ohio, including 7 DOT specification 112J tank cars and 2 DOT specification 105J tank cars transporting butane. All of these tank cars were equipped with head shields and thermal protection. Additionally, all 9 tank cars were equipped with shelf couplers, and some shelf couplers broke during the derailment. Several of these tanks then sustained, without failure, severe strikes to their heads with some strikes inflicted in the upper portion of the tank heads. None of these tanks were punctured.

The Safety Board believes that the accident data from the past twenty years clearly demonstrate the vulnerability of tank car heads to puncture during derailments even, at times, when equipped with shelf-type couplers. The effectiveness of head shields and thermal protection has been equally demonstrated in accidents involving tank cars that were so equipped. The effectiveness of head shields has also been recognized by rail carriers, chemical companies, and industry associations. Further, RSPA has acknowledged in the ANPRM that the Union Pacific Railroad recommended, on behalf of three chemical companies and four other rail carriers, that existing tank cars be retrofitted with full head shield protection. Also, the Chlorine Institute has publicly acknowledged that head shields should be installed on existing tank cars that transport chlorine (even though these tank cars usually have capacities less than 18,500 gallons).

In addition, a recently completed study sponsored by the Railway Progress Institute and the Association of American Railroads entitled "Analysis of Tank Cars Damaged in Accidents, 1965 through 1986" concluded that the inclusion of shelf couplers and head shields reduced the probability of a head puncture on DOT specification 112 and 114 by 91 percent. The study also noted that 18 percent of the head punctures on DOT specification 112, 114, and 105 tank cars during this period were in the upper half of the tank head. A second similarly sponsored study entitled "Railroad Tank Car Safety Assessment" concluded that thermal shields, head shields, and shelf couplers are "clearly associated with reduced spillage of hazardous materials in recent years."

As a result of its investigation of the collision and derailment in Helena, Montana, the Safety Board issued Recommendation R-89-80 to the DOT to:

> Evaluate present safety standards for tank cars transporting hazardous materials by using safety analysis methods to identify the unacceptable levels of risk and the degree of risk from the release of a hazardous material, and then modify existing regulations to achieve an acceptable level of safety for each product/tank car combination.

The Safety Board recognizes that the determination of the risks associated with various materials, the risks acceptable to the public, and the criteria for the packaging required to transport hazardous materials at

acceptable risk levels will take more than a few months to complete. When RSPA completes this long term project of using safety analyses to evaluate the risk level of all products and the protection needed to lower those risks to an acceptable level, additional products will likely be identified that need the added protection of head shields and thermal protection. However, the Safety Board believes that the need for head shield and thermal protection for the transportation of certain products in certain containers has already been well established. Therefore, the Safety Board urges the RSPA to move expeditiously to issue and implement final rules that would require full head shields and thermal protection for:

1. all DOT specification 105 tank cars with a capacity of 18,500 gallons or less and used to transport flammable gases, ethylene oxide, or other products that now require head shield and thermal protection when shipped in 105 tank cars exceeding 18,500 gallons; and

2. all tank cars transporting class A poisons, materials that are toxic by inhalation, and specialty products such as high strength acids, chlorine, oxidizers, and other extremely reactive materials.

Grandfathering Provisions

In its letter of March 1, 1988, commenting on the Notice of Proposed Rulemaking (NPRM) under docket HM-181, "Performance-Oriented Packaging Standards; Miscellaneous Proposals," the Safety Board found that some proposed requirements for bulk shipments of hazardous materials in tank cars were inconsistent and could result in a reduced level of safety. For example, proposed section 173.314(b)(6) would have provided a grandfather exemption for tank cars built before December 30, 1971, that were to be used to transport flammable gases. Such tank cars would not have been required to have heat resistant gaskets for manway covers and for mountings of fittings. However, the proposed regulation would have required tank cars manufactured after December 30,, 1971, to have gaskets made of heat-resistant materials approved by the Association of American Railroads (AAR) Tank Car Committee. The NPRM did not propose a date by which the tank cars built before 1972 would have to meet the improved standards. Therefore, the Safety Board stated in its letter:

> The Safety Board believes that it is time to stop permitting tank cars that fail to meet current minimum safety requirements to be used to transport dangerous materials under "grandfather clauses." As a minimum, the DOT should establish a specific date by which all tank cars would have to comply with the new requirements.

The Safety Board reiterates these comments, and urges RSPA to establish dates by which all existing tank cars must meet all tank car safety requirements.

APPENDIX G

Bottom Manway Openings

Based on its investigation of the release of butadiene and resulting in fire from a tank car with a bottom manway that occurred in New Orleans, Louisiana, on September 8, 1987, the Safety Board recommended that the Federal Railroad Administration prohibit the use of tank cars with a manway below the level of the liquid being transported from use in hazardous materials service. In its report of this accident, the Safety Board noted that the design for tank cars with bottom manways were approved for hazardous materials service without an assessment of the design based on service trials or performance. The Safety Board also concluded that it was unlikely that a hazardous materials leak through a bottom manway during transportation could be stopped.

RSPA noted in the ANPRM that it was the understanding of both RSPA and the FRA that there are no longer any United States tank car tanks equipped with bottom manways openings that might be used for hazardous materials transportation in the United States; however, Canadian and Mexican tank car tanks with bottom manways might still be used in hazardous materials transportation in the United States. Because tanks of this design are more susceptible to a catastrophic release similar to that in New Orleans, the Safety Board believes that all tank car tanks with bottom manway openings, including those owned by Canadian and Mexican interests, should not be authorized for the transportation of hazardous materials within the United States. The Safety Board therefore urges RSPA to prohibit the use of these tank car designs under this rulemaking.

Design and Integrity of Tank Car Closure Fittings

The Safety Board is also concerned about the integrity of the closure fittings for rail tank car tanks. The head-on collision of two freight trains in Altoona, Iowa, on July 30, 1988, resulted in the release and ignition of denatured alcohol from the manways and safety relief valves on two derailed tank cars although there was minimal damage to the tanks. During hydrostatic tests that were conducted on the two tank cars following the accident, considerable effort had to be expended by workers to secure the manways sufficiently to hold the 100 psig test pressure. Further, the safety relief valves on the two tank cars were found to be unevenly seated when they were removed for bench testing.

The Safety Board noted in its report of this accident that current regulations do not include standards that address the performance in accidents of tank cars and the closure fittings on tank cars. Derailments of tank cars typically lead to overturning; yet, safety relief valves and manways are not tested in positions other than the vertical to determine if these fittings can prevent the release of the material being transported. Also, manufacturers of rail tanks are not required to provide the minimum torques and gasket specifications that would ensure that liquid and vapor tight seals are attained when the fittings are mounted or secured.

The Safety Board believes that closure fittings and safety relief valves should maintain their integrity in accidents that are survivable by the rail tank. Therefore the Safety Board urges RSPA to develop and implement, in coordination with the Federal Railroad Administration, regulations concerning the integrity of closure fittings as requested in Safety Recommendations R-89-48, -49, -53, and -54 (which were addressed in the ANPRM).

The Safety Board appreciates the opportunity to make these comments.

Sincerely,

James L. Kolstad
Chairman

APPENDIX H

ASSOCIATION OF AMERICAN RAILROADS' RECOMMENDED RAILROAD OPERATING PRACTICES FOR TRANSPORTATION OF HAZARDOUS MATERIALS

APPENDIX H

H. H. Bradley
Vice President

ASSOCIATION OF AMERICAN RAILROADS

January 4, 1990

CIRCULAR No. OT-55

RECOMMENDED RAILROAD OPERATING PRACTICES

FOR TRANSPORTATION OF HAZARDOUS MATERIALS

TO THE MEMBERS:

Based on recommendations of the Inter-Industry Task Force on the safe transportation of hazardous materials by rail, the O-T General Committee and the AAR Board of Directors, approved for immediate publication the following recommended operating practices for the transportation of hazardous materials.

Road Operating Practices

I. Industrywide Implementation of "Key Trains"

A. Definition: Any train with five tank car loads of poison inhalation hazard (packing group I, as defined in HM-181) or 20 car loads or intermodal portable tank loads of a combination of PIH (PG I), flammable gas and Class A explosives, shall be called a "Key Train".

B. Restrictions:

1. Maximum speed -- "Key Train" - 50 MPH.

2. Unless siding or auxiliary track meets FRA Class 2 standards, a Key Train will hold main track at meeting or passing points, when practicable.

3. After 12/31/93 no cars with friction bearings will be permitted in any "Key Train". The AAR will initiate the process of amending the Interchange Rules to require that all cars with friction bearings be eliminated from interchange service by 12/31/93 rather than the current date of 12/31/94.

Operations and Maintenance Department
50 F Street, N.W., Washington, D. C. 20001 (202) 639-2200

4. When a moving "Key Train" is stopped by any emergency brake application or by some unknown cause the train must be inspected for derailed or defective cars. If the train is stopped at a place where it cannot be safely inspected (e.g. bridge), the train may be moved, if conditions permit, to the nearest place where it can be safely inspected.

5. If a defect in a "Key Train" journal is reported by a wayside detector, but a visual inspection fails to confirm evidence of a defect, the train will not exceed 30 MPH until it has passed over the next wayside detector. If the same car again sets off the next detector it must be set out from the train.

II. Industrywide Designation of "Key Routes"

A. Defintion: any track with a combination of 10,000 car loads or intermodal portable tank loads of hazardous materials, or a combination of 4,000 car loadings of PIH (PGI), flammable gas and Class A explosives, over a period of one year.

B. Requirements:

1. Wayside defective bearing detectors shall be placed a maximum of 40 miles apart on "Key Routes", or equivalent level of protection may be installed based on improvement in technology.

2. Main Track on "Key Routes" must be inspected by rail defect detection and track geometry inspection cars or an equivalent level of inspection no less than two times each year, and sidings must be similarly inspected no less than one time each year.

3. Any track used for meeting and passing "Key Trains" must be Class 2 or better. If a meet or pass must occur on less than Class 2 track due to an emergency, one of the trains must be stopped before the other train passes.

III. Yard Operating Practices

A. Maximum reasonable efforts will be made to achieve coupling of loaded placarded tank cars at speeds not to exceed 4 MPH.

B. Loaded placarded tank cars of PIH (PGI) or flammable gas which are cut off in motion for coupling must be handled in not more than 2-car cuts, and cars cut off in motion to be coupled directly to a loaded placarded tank car of PIH (PGI) or flammable gas must also be handled in not more than 2-car car cuts.

IV. STORAGE

Proposed Separation Distance

Loaded Tank Cars and Storage Tanks from Mainline,
Class II Track or Better

Activity	Combustible Liquid, Corrosive Material and ORM's	PIH (PGI), Flammable Liquid, Flammable Gas, Non-flammable Gas and All Other Hazard Classes
Loading or Unloading		
If conditions permit	50	100
Not less than	25	50
Storage of Loaded Tank Cars	25	50
Storage in Tanks		
If conditions permit	50	100
Not less than	25	50

With regard to existing facilities maximum reasonable effort should be made to conform to this standard taking into consideration cost, physical and legal constraints.

The proposals apply to storage on Railroad property and on chemical company property located close to Railroad mainline.

V. TRAINING OF TRANSPORTATION EMPLOYEES

Implementation of Railroad Industry Training Objectives for Railroad Operating Employees

The following objectives should be met in every railroad's program for training operating employees (non-emergency responders) who handle hazardous materials in transportation:

A. Employees (including supervisors) who handle shipments of hazardous materials in rail transportation should learn to perform the following tasks as they apply to their assigned duties:

1. Comply with the requirements for hazardous materials shipping data in rail transportation of hazardous materials.

2. Recognize markings and placards that indicate the presence of hazardous materials.

3. When required by regulation, inspect the external conditions of placarded hazardous materials shipments to assure that they are properly prepared for transportation.

4. Switch placarded hazardous material shipments in compliance with applicable rules and regulations.

5. Place placarded hazardous material shipments in a train in compliance with applicable rules and regulations.

B. Employees (including supervisors) who handle shipments of hazardous materials in rail transportation should learn to perform the following tasks in hazardous materials incidents:

1. Make the appropriate identifications and notifications and provide the appropriate information, as required by railroad operating rules and instructions for handling hazardous materials.

2. Take appropriate action to protect self and others on the scene.

3. Provide assistance to the local emergency response agencies in the form of identification of the hazardous materials and their location(s) on the train.

C. The training objectives set out in paragraphs A and B above should apply to and meet the specific requirements of particular crafts, for example: train crews, inspectors, and clerks who prepare consist information.

D. The objectives set out in paragraphs A and B above cover a basic training program for employees (including supervisors). Frequency of training in this category should be consistent with the timing of existing railroad reexamination programs.

E. Training of employees (including supervisors) who handle shipments of hazardous materials on a "Key Route" (as defined in Part II above) should be conducted on an annual basis. This training should meet the objectives set out in paragraphs A and B above, but should also cover additional subject matter, including special hazardous material operating requirements for the route, yard emergency plans and practices in those plans, and basic chemical characteristics. Each of these employees should demonstrate proficiency by passing a written examination or by other means, such as a successful work practices audit.

F. All training should be recorded. It will suffice if the individual carries a card indicating that he meets certain requirements, or if his personnel record indicates the date and level of training received.

VI. TRANSCAER

Transportation Community Awareness and Emergency Response
(Endorsed by AAR and CMA)

Implementation of Transcaer

Railroads will implement a national community outreach program to improve community awareness, emergency planning and incident response for the transportation of hazardous materials. The objectives of TRANSCAER are as follows:

- Demonstrate the continuing commitment of chemical manufacturers and transporters to the safe transportation of hazardous materials.

- Improve the relationship between manufacturers, carriers and local officials of communities through which hazardous materials are transported.

- Inform Local Emergency Planning Committees (LEPC's) about hazardous materials moving through their communities, and the safeguards that are in place to protect against unintentional releases.

- Assist LEPC's in developing emergency plans to cope with hazardous materials transportation incidents.

- Assist community response organizations in preparations for responding to hazardous materials incidents.

An important product of the TRANSCAER program will be to overcome the widespread belief that every local firefighter and policeman must have the expert skills and equipment to respond personally to any hazardous materials emergency. Through the awareness training and contingency planning provided through TRANSCAER, states and local communities will be able to pool their expertise and resources with those of industry to provide for a coordinated and better managed emergency response system.

TRANSCAER must be highly publicized to produce the maximum desirable enhancement of public awareness.

To ensure the success of TRANSCAER, railroads must be prepared to focus training and assistance in contingency planning for all local communities on Key Routes (as defined in Part II above), and also to assist any other community on a rail line upon request. TRANSCAER should be highly publicized to produce the maximum desirable enhancement of public awareness, recognizing that once this occurs, there will be inevitable immediate requests for assistance from many communities, even those which we believe are at low risk. There will also be requests for assistance in "skills" training, to which we must be prepared to respond in a prudent and effective way. An AAR and CMA Task Group is currently developing resource material to assist in this community outreach program. Six workshops are scheduled for 1990.

On behalf of the General Committee. Each AAR member will commit without reservation to comply with these recommendations/standards.

Very truly yours,

H. H. Bradley

* U.S. G.P.O.:1991-281-626:20052

END

DATE

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