Hazardous Materials on the Rails

A Case Study of the Union Pacific Railroad: the Nation's Largest Chemical Hauler

Photo Courtesy of KSNT-TV, Topeka, KS

Two Union Pacific Trains Collide
in Rossville, Kansas — July 1, 1997

The entire community evacuated while waiting to learn whether hazardous materials were burning in the fire. A Federal Railroad Administration spokesman said, "Today's accident in Kansas sort of underlines our concern...Safety needs to be looked at much closer."

The Good Neighbor Project for Sustainable Industries

The Good Neighbor Project, a project of the nonprofit Tides Center, seeks to ensure that America's corporations are good neighbors to the communities in which they operate. Our legal, technical and strategic initiatives seek to advance the public's Right to Know about corporate behavior, to empower neighbors and workers through public policies and negotiated agreements, and to forge alliances between affected constituencies including community, environmental, and religious organizations, investors, and labor unions.

We are grateful to the International Brotherhood of Teamsters for a special grant that made this report possible. The Teamsters Union has previously issued investigative reports into Union Pacific corporate accountability issues, including campaign spending and political influence, excessive executive compensation and conflicts of interest on the UP Board of Directors. We hope that this report will serve as a useful complement to that previous work by the Teamsters.

Thanks also to the Nevada Citizen Alert, John Gardner, Mark Demuth of MADCON Consultation Services, the City of Reno, the United Transportation Union, and the Brotherhood of Locomotive Engineers, for their cooperation in our research. Thanks to the National Environmental Law Center for groundbreaking work on chemical accident safety which paved the way for this report. We are grateful for the support and cooperation of the above listed organizations and individuals, however, the Good Neighbor Project of the Tides Center retained exclusive responsibility for the editorial content of this report. We worked to ensure that this report is accurate. If you have additional information which we should be aware of please contact the Good Neighbor Project.

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Visit our website at http://www.envirolink.org/orgs/gnp
for more on Union Pacific and the transportation of hazardous materials, including illustrations, and links to other resources.
HAZARDOUS MATERIALS ON THE RAILS
A Case Study of the Union Pacific Railroad --
the Nation's Largest Chemical Hauler

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A REPORT OF
THE GOOD NEIGHBOR PROJECT FOR
SUSTAINABLE INDUSTRIES

August 15, 1997
HAZARDOUS MATERIALS ON THE RAILS
A CASE STUDY OF THE UNION PACIFIC RAILROAD

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EXECUTIVE SUMMARY
HAZARDOUS MATERIALS ON THE RAILS
A CASE STUDY OF THE UNION PACIFIC RAILROAD —
THE NATION’S LARGEST CHEMICAL HAULER

EXECUTIVE SUMMARY

An increasing volume of American industry’s chemical products are moving on the rails. Between 1990 and 1995, chemical shipments via rail grew almost 30 percent, from 1.4 million to 1.8 million car loadings shipped.

This report examines the hazards of rail transportation and the potential for improving safety through a case study of the nation’s largest chemical hauler, the Union Pacific Railroad. In the wake of that railroad’s 1996 merger with the Southern Pacific railroad, UP is expected to continue to expand its hazardous materials freight shipping. In the last three years, Union Pacific’s hazardous materials shipping has grown an average of 7.5 percent per year. UP will report an increased chemical flow from the addition of Southern Pacific’s hazardous materials volumes during 1997. In addition, it is reasonable to anticipate that partly due to expanded reach of the rail line from the merger, UP’s growth of hazardous materials shipping will continue or even accelerate in the next few years.

Several rail incidents at Union Pacific in the summer of 1997 illustrate some of the concerns posed by rail safety and chemical accident prevention. In June and July Union Pacific Railroad experienced two lethal collisions of its freight trains, a third near collision, and a chemical traincar derailment.

♦ June 22, Devine, Texas. Two UP trains collided head-on on June 22. Four people were killed. The Federal Railroad Administration (FRA) found, on a preliminary basis, that a train movement order of one of the trains to proceed from a side rail had apparently not adequately emphasized or conveyed the need to first await passage of the other train.

♦ June 24, Waukegan, Illinois. A UP dispatcher sent a coal train into the path of a Metra commuter train. Rail officials said the coal train was mistakenly diverted into the path of Metra Train No. 342 to avoid a construction area. The opposing trains stopped about two miles apart.

♦ July 1, Rossville, Kansas. A collision of UP trains. One rail employee was killed and the community of Rossville, Kansas was evacuated. A smokey cloud hovered over townspeople’s heads during the early morning evacuation of all 1100 residents. Officials at the scene were uncertain whether the train’s toxic cargo — that reportedly included sulfuric acid, nuclear materials and chlorine — were being emitted in the huge fire at the crash scene. A spokesman for the Federal Railroad...
Executive Summary - Hazardous Materials on the Rails

Administration, said, "Today's accident in Kansas sort of underlines our concern... Safety needs to be looked at much closer."

July 23, Deer Park, Texas. At 5:15 AM a UP train reportedly went over a broken rail, leading to derailment of tankcars containing various hazardous materials. While no materials were released, the derailed train tumbled into a ditch, narrowly missing a liquid petroleum gas pipeline. In the event the pipeline had been struck, a large explosive fire could have ignited railcars.

These recent events raise a troubling question for rail communities. Are hundreds of communities near rail lines and railyards at risk? We examined recent literature and government records, conducted database searches, and communicated directly with rail employees, rail neighbors, and local officials. This investigation is preliminary in nature, intended to identify issues of concern and does not constitute a comprehensive evaluation or a comparative review of safety by different carriers.

Hazardous materials shipments by rail rose 25 percent in the early 1990's. Rail shipments are expected to continue to climb in the late 1990's, partly spurred on by the merger of the Union Pacific and Southern Pacific Railroads. Source of data: American Association of Railroads, Bureau of Explosives, Annual Report on Rail Shipments, 1996.
Executive Summary - Hazardous Materials on the Rails

While our research effort only scratched the surface, we were able to conclude that there is need for further investigation and action by local citizens and by federal, state and local officials regarding hazardous materials transportation on the rails.

While the Union Pacific Railroad has done relatively well in the last five years in controlling the growth in the number of chemical spills and releases during its expansion of rail chemical traffic, it is facing new challenges on maintaining and improving safety as a result of the rapid growth of both the railroad and its hazardous materials business. As it brings together the employees, cultures and operations of two large railroads, the company's commitment to using the “best practices” of either of the two rail lines may yield a few improvements. However, our research raises doubts as to whether either UP or SP are yet engaging in “best practices achievable” from the standpoint of ensuring safest technologies, human resources (staffing policies), emergency preparedness and public accountability. We recommend that any further growth of hazardous materials shipping on the Union Pacific line should be preceded by additional safety measures and accountability.

CHEMICAL INCIDENT STATISTICS

- For the five year period 1991-1995, a total of 2,090 hazardous materials incidents were reported by Union Pacific and Southern Pacific. These entailed smaller spills and releases such as leaks from tank cars and diesel engines, as well as serious incidents that posed grave hazards to workers, rail neighbors or the environment.

- From 1993 through 1996, Union Pacific experienced a total of 28 train accidents (derailments, collisions or other accidents) which involved chemical spills or releases.

- Union Pacific has hundreds of nonaccident-related chemical releases each year, most of them involving tank car leaks. These incidents have included frightening events such as the spraying of phosphoric acid over 20 miles of a train track outside of Reno, NV, from a leak in a tank car. According to Union Pacific, the causes of nonaccident releases include mechanical problems such as valve failures and ruptured disks. Some of the causes, such as ruptured disks, are likely to improve in current and future reporting years due to corrective measures.

LAPSES AND OMISSIONS IN CHEMICAL TRACKING AND REPORTING

- All freight trains are supposed to be accompanied by materials data sheets, known as a "consists". But railroad workers told us these forms are not always reliable. According to Union Pacific itself, approximately 10% of the railroad's 9,000 chemical tank car inspections last year found "exceptions," such as unlabeled or mislabeled tankers, or tops not positioned properly on tank cars.
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Some shipments of extremely dangerous materials, such as phosgene gas or nuclear materials, would be of special concern to local communities if they are being shipped on local rails. But local emergency planners told us that Union Pacific does not generally notify the public and local officials of a high hazard shipment in advance of its imminent passage through the community.

THE PUBLIC NEEDS A RIGHT TO KNOW

In its application for the merger with Southern Pacific Railroad, Union Pacific omitted “Right to Know”-type information regarding the amounts and types of hazardous materials that would be shipped by the merged rail system. The Surface Transportation Board (STB) is the agency overseeing the merger process. Its rules, generally require such information to be submitted with an application. The STB also failed to prepare an Environmental Impact Statement (EIS) for the merger which would have detailed the various environmental impacts of the merger and the options for mitigation.

Union Pacific has in its possession data that would be appropriate to be shared broadly with the public. These include the railroad’s chemical flow data, railyard inspection reports, environmental audits, and risk assessments of rail transportation. A Union Pacific official expressed a willingness to share some of this data with local communities, though prior local experience in requesting such data from the carriers has met with mixed results.

Chemical rail transport is exempt from important federal and community environmental Right to Know laws. Union Pacific fought state level disclosure rules in Wyoming but eventually dropped its lawsuit challenging the law. Most other states have not yet followed Wyoming’s lead to require needed disclosures from the railroads.

RECOMMENDATIONS: Federal, state and local governments should establish and enforce strong Right-To-Know rules applicable to all the railroads. The Surface Transportation Board should require disclosure of Union Pacific’s chemical transport plans under the merger, and prepare an Environmental Impact Statement to address the range of environmental impacts and mitigation options. In the meantime, local community organizations and unions can negotiate Good Neighbor Agreements to require railroads to publicly share health and safety information and establish other needed accountability. Examples of documentation that Union Pacific and other railroads should be encouraged to share broadly with their host communities include:
Executive Summary - Hazardous Materials on the Rails

— a printout of the chemicals and volumes in transit for each railyard and rail line, over the previous year;
— five years of inspection reports from each railyard or region;
— a list of all accidents, leaks and near misses on the rail line;
— safety and environmental audits.

Local emergency planners should also request such information from the railroads, and utilize it to generate worst case rail accident scenarios and effective response plans preparing for such events.

OVEREXTENDED AND UNDERTRAINED WORKERS?

♦ In 1985, Union Pacific hauled 3.2 million rail car shipments. By 1995, that figure had increased to 5.7 million rail car shipments hauled by Union Pacific, a sixty-seven percent increase over ten years. Concurrently, Union Pacific downsized its workforce from 37,600 workers in 1985 to 33,400 by 1995. Downsizing the workforce and increasing rail car shipments, the railroad increased the ratio of car shipments to workers. Whereas in 1985, the ratio was 85:1, that ratio doubled by 1995 to 170:1 rail car shipments per worker.

♦ With fewer employees per unit shipped, employees report that they are being made to work long hours, leaving many with a constant feeling of jet lag due to inadequate time to rest. Rail workers we spoke with also suggested that they are not trained sufficiently to respond to or prevent chemical accidents on the rails. Exhausted, undertrained workers may make dangerous errors in judgment in hauling and managing freight trains — placing themselves as well as the communities through which the trains pass at risk.

♦ A recent collision and near-collision led to concerns regarding potential undertraining and overwork of Union Pacific dispatchers. The dispatching of many Union Pacific trains occurs from the railroad’s centralized dispatching point at its Omaha, Nebraska headquarters. A dispatching center is much like an air traffic control tower, with potential for collisions if train-movement communications are not conveyed carefully and clearly.

♦ In recent accidents, Union Pacific trains derailed or collided after reaching improper speeds or departing from siderails sooner than they should have.

♦ While all railroads are reducing the ratio of workers to railcars, the issue is particularly significant for Union Pacific because of the added potential consequences of high-volume hazardous materials hauling.

RECOMMENDATION: Thorough review of the railroads’ staffing and training practices should be undertaken by federal investigators, FRA and National
Executive Summary - Hazardous Materials on the Rails

Danger zone may extend 20 miles or more

Death zone: Concentrations dangerous to life and health

10 mile travel radius of toxic gas cloud

Location of Release Incident

Chemical Accident Scenario for 100,000 pound Tank Car
See Text for Explanation

DANGER - Nuclear Contamination Zone Radiation Poisoning

Nuclear Accident Scenario
See Text for Explanation and Sources.
Executive Summary - Hazardous Materials on the Rails

Transportation Safety Board (NTSB), to ensure a safe, well-rested workforce, both in dispatching and field operations. High-volume haz-mat operations such as Union Pacific should be the first carriers reviewed. (The FRA reportedly has already begun such an evaluation regarding Union Pacific dispatching.)

SAFETY DEFECTS ON TRAINS

 totalement A Federal Railroad Administration surprise inspection of a Union Pacific railyard in February 1995 found that 37 percent of the rail cars were defective, including 96 with brake problems.

RECOMMENDATION: The railroads should be required to make defect rates broadly and immediately available to the public, based on day-to-day assessments at each railyard.

HAULING TOXICS THROUGH DARK TERRITORY

 totalement Railroads traverse many “dark” areas where automated signaling has not reached, and railroad dispatchers issue radio-communicated “warrants” for train movements. The Union Pacific collision this June in Devine, Texas occurred in such a “dark” territory (see above). Nationally, 85% of rail transport (on all railroads) is in “dark” areas.

 totalement Safer technologies known as “positive train separation” or “proximity warning devices” can automatically provide engineers with a warning when they are approaching another train. These technologies are available to help prevent collisions in dark areas, but are reportedly not widely applied by railroads in the US.

RECOMMENDATION: Railroads should be required to make their dark territory statistics and plans for elimination of dark territory broadly available to the public. In addition, the Federal Railroad Administration should require the railroads to apply “positive train separation” or its equivalent in dark territory, especially where hazardous materials are being hauled.

HOST COMMUNITIES MAY BE ILL-PREPARED TO COPE WITH THE RAILROADS’ WORST ENVIRONMENTAL AND PUBLIC SAFETY HAZARDS

 totalement Our analysis indicated that a chemical transportation accident on the rails could cause death and injury up to ten or more miles from a rail line. A nuclear transport incident on the rails could reportedly contaminate 40 square miles.

 totalement While Union Pacific has been conducting training of emergency responders and planners, review of emergency warning and response planning in two rail host areas — Louisiana and Reno, NV — indicated communities may not be consistently
Executive Summary - Hazardous Materials on the Rails

ready with state of the art response equipment, notification strategies and other plans for hazardous material release incidents.

♦ Union Pacific’s contingency plans for accidents require notification of federal and local officials, but leave the question of notification of local residents up to individual host communities. As a result, local emergency planning processes may unevenly, and in some cases ineffectually, address issues such as the means of notifying local residents.

RECOMMENDATION: Rail lines that haul hazardous materials should be required to annually disclose the quantities, volumes and types of hazardous materials hauled through each area in the previous year, in order to allow effective emergency planning. Each rail carrier should be required to pay a fair share of the costs of baseline emergency preparedness in all underprepared host communities, including providing needed local emergency response equipment. Chemical-intensive haulers like Union Pacific should subscribe nationally or locally to an emergency telephone notification system that would quickly call each endangered household at the site of a release in the event of an accident, instructing them on the best course of action.

SURFACE TRANSPORTATION BOARD APPOINTMENTS PRESENT OPPORTUNITY FOR IMPROVED ACCOUNTABILITY AND SAFETY

♦ The Surface Transportation Board (STB), the federal agency which is overseeing the Union Pacific/Southern Pacific merger, has been accused by host communities of bias against local community and environmental interests. Specifically, the STB failed to require a full Environmental Impact Statement on the merger, failed to require UP to make detailed chemical Right to Know disclosures contained in STB rules, and abruptly halted its community mitigation meetings which were planned for this summer in Reno, NV.

RECOMMENDATIONS: President Clinton should fill the current vacancy on the STB with an appointee who is sensitive to public safety, and to community, labor and environmental concerns. Consideration should also be given to removal of the current Board chair. Union Pacific’s merger process, in particular, merits closer scrutiny by federal agencies as well as rail unions and public interest organizations to evaluate safety and environmental impacts. Additional increases in shipments of hazardous materials in urban areas like Wichita, KS and Reno, NV should be deferred until such review of the impacts of the merger is completed and a full mitigation plan is in place.

ESTABLISH GOOD NEIGHBOR AGREEMENTS FOR RAIL CARRIERS

Some of the community concerns identified in this report can be addressed through “Good
Neighbor Agreements” between host communities and the railroads. Such agreements could include:

♦ relocating toxic transport rail lines away from the most populous areas;
♦ providing one week’s advance notice of shipment of the most highly radioactive nuclear, explosive or toxic materials through the community;
♦ shipment of dangerous materials only in dedicated, rigorously supervised and inspected trains, rather than in mixed shipments;
♦ regular commitments to disclosure of each carrier’s audits, inspections, etc. to the public and to local government;
♦ adding signaling systems and grade crossing signals at all points where chemical cars may cross.

# # #
About the Good Neighbor Project

The Good Neighbor Project is a national program of the nonprofit Tides Center, geared to ensuring safe, clean, sustainable industrial neighbors. We support coalition building efforts to ensure environmental and economic accountability of corporations. We support efforts in local communities to enhance environmental safety at refineries, chemical plants, electronics firms, and other large and small industries.

About the Author

Author Sanford J. Lewis is a leading expert on the public's Right to Know regarding environmental hazards. He is the Director of the Good Neighbor Project and an attorney whose clients have included local, state and national organizations, and state and local government. He is a leading proponent of Good Neighbor Agreements between community groups and corporations, and of "neighbor-worker" processes for evaluating and improving local industries' sustainability. He chairs the Network Against Corporate Secrecy, a national network of over 100 environmental, labor and community organizations, and in 1994 chaired a process of collaborative review and comment by national labor and environmental organizations on USEPA's Chemical Accident Prevention (Risk Management Plan) regulations under the Clean Air Act.

Mr. Lewis is also an instructor of Environmental Law in graduate programs at Tufts University (1991-present) and U.C.L.A. (1995-1996). He received a J.D. from the University of Michigan Law School and a B.S. in Environmental Science at Cook College, Rutgers University. He is a member of the Boards of Directors of the Environmental Law Network International, and Communities Concerned About Corporations.
Hazardous Materials on the Rails

INCIDENT REPORTS

Breaches in Safety on the Union Pacific & Southern Pacific Railroads
INCIDENT REPORT

Rossville, Kansas - July 1, 1997
Collision of Two Union Pacific Trains Followed by Fire and Evacuation

Source: Except as otherwise noted: Wichita Eagle Online, July 2, 1997.

Two Union Pacific freight trains collided at about 2:30 AM. An engineer was killed and another employee seriously injured. The wreckage burned in an enormous fire. The huge dark cloud that hovered over the site led the fire responders to believe that toxic chemicals (chlorine, sulfuric acid and nuclear materials) on the train might be burning, and therefore instituted an evacuation. Sirens wailed and emergency personnel walked door to door telling residents to evacuate. All 1,100 residents of the community were evacuated. However, it turned out that the chemical tankers on the train were not burning, and that the cloud was likely due to the burning tires on the several train cars of automobiles caught in the blaze.

The collision reportedly occurred when a train that was coasting slowly on a siderail pulled out onto the main rail, ploughing into another freighter that was already moving 70 mph on the same main rail, from the opposite direction.

Because there was no telephone broadcast alert system in place, the notification of local residents had relied on the potentially less effective notification methods — sirens and door knocking. This slow process could have endangered many lives had there been a serious chemical accident and disadvantageous meteorological conditions.

Barb Newsham, told the Wichita Eagle "My mom called me at 4 this morning and said, 'Have you heard all the sirens?' " "I said, 'No,' and she said, 'There's been a train crash, and poisonous gas is escaping. You need to get out of town now.' "

"My husband and I put wash rags on my kids' faces, and we were out of the
house within 10 minutes, tops," Newsham recalled. "It was just scary," she said... "it could have been a lot worse."

Aaron Kelly, Jr., administrator of a nursing home three miles from the site, said he was alerted of the accident about 3:40 a.m., which was over an hour after the crash. It took an hour and half, using seven ambulances and two school buses to evacuate the 76 residents of the nursing home. He said that as the evacuation was completed, he looked up in the sky and saw the smoke cloud reaching a different area, about as far from the site as the nursing home. Kelly considered this a fast and effective evacuation, which was made possible partly because of prior experience with evacuations — the home had actually been evacuated twice before, during flooding. (Source: Telephone interview with Aaron Kelly by Sanford Lewis, July 8, 1997.)

Comment: The nursing home residents should consider themselves fortunate — different materials burning and different meteorological conditions could have advanced a ground-hugging toxic cloud more quickly in their direction.

INCIDENT REPORT

Devine, Texas — June 22, 1997
Head-on Collision of Two Union Pacific Railroad Trains


Two Union Pacific trains collided head-on, apparently from opposite directions on the same track. The wreck killed two members of the train crew and two transients who were riding the train.

After this incident, the Federal Railroad Administration issued an industrywide alert and directive. The directive implied that FRA’s preliminary findings indicated that a Union Pacific dispatcher’s movement warrant of one of the trains to proceed from a side rail had apparently not adequately emphasized or conveyed the need to first await passage of the other train. See text, chapter 1, for additional discussion of this incident and possible causes.
INCIDENT REPORT

Chichester, Arkansas, September 17, 1990
Union Pacific Derailment, Nitric Acid Leak, Evacuation


The train jack-knifed when a wheel unit locked in a turn and seven cars jumped off the rails, including a tanker car carrying 4,600 gallons of nitric acid. The tanker released a plume of orange gas. Nitric acid can lead to suffocation if inhaled and causes severe burns to eyes and skin. 340 residents were evacuated. The wreck also risked chemical explosion from another car, spilling ammonium nitrate. The hazard was contained after three days, and remarkably, no one was hurt.

INCIDENT REPORT

December 1996 Union Pacific Bomb Train
Oklahoma to California
Source: Memo of James T. Schultz Associate Administrator for railroad safety, to FRARCC D. Smith, 1/16/97.

In December 1996 a "bomb train" on the Union Pacific line was discovered with "wholesale violations" according to an internal memorandum of the Federal Railroad Administration. While it was not clear from the record exactly what type of bombs were involved, bombs had actually broken through their containers and were protruding onto the floor of a flat car.

The train had travelled all the way from Oklahoma to Stockton, California with no corrective action by UP at any of the major terminals it had traversed. The railroad had even planned to move the train to Chicago despite the defects until intervention by the FRA stopped it. Wrote a high-level FRA staffer: "The UP needs a big time wake up call with this case. The way we see it, if they can't take care of class A explosives, makes you wonder what they are doing with other HM [hazardous materials]."
Dunsmuir, CA 1991
Southern Pacific Derailment Spills Herbicide into a River

Source: Except as otherwise noted excerpted with permission from Jim Martin, *The Dead River: A Visit to the 1991 Dunsmuir Toxic Spill.*

Under a new moon on Sunday, July 14th, 1991, a Southern Pacific freight train was laboring up and around Cantara Loop... It was a long train, ninety-five cars in all and only eleven of them were loaded. The rear end of the train was weighted by six heavy gondolas full of scrap metal. Eighty-four empty cars connected the scrap metal to the payload towards the front. One of the tankers in the payload contained a soil sterilizer with the trade name Vapam, or metam sodium. As the torque of the load increased around the tight loop, an engine jumped its rails, snake-whipping the train behind it. Some of the cars were forced to the right of the rails, others to the left, gouging a quarter-mile of skid marks into the ties in the rail bed as the train came to a halt. Before it did, an engine and the tanker full of metam sodium toppled off the bridge into the Upper Sacramento River.

[The pesticide spilled into the Upper Sacramento River caused massive fishkills, and damaged vegetation over 42 miles. It also migrated to Lake Shasta, California's largest reservoir. Hundreds of thousands of fish were killed, about 700 people reportedly became sick. ]
Source: Frank Clifford, Cajon Pass Spill Fuels Bid to Save Disaster Team, Los Angeles Times, March 14, 1996.

Two days after the derailment the green slick had traveled more than 11 miles. While offering its apologies to the citizens of California for the tragedy, Southern Pacific had yet to take any measure to stop the spreading contamination. Six days after the spill the slick had drifted downstream 45 miles. Close to 200 people living along the river in the town of Dunsmuir were treated at a nearby hospital for respiratory problems. Robert Holquist, a reporter for the Redding Record-Searchlight, saw trout leaping from the water and onto the banks, apparently choosing to suffocate there, rather than
in the contaminated water.

Metam sodium reacts upon contact with water to become a noxious fume. This fume was reported to be mustard gas by the media, but a researcher in chemical recycling wrote into the Santa Rosa Press Democrat to correct the mistake: it was akin to "mustard oil."

Whatever the make-up of the spilled chemical and its fumes, it had a slaughterous effect on every living thing in the Upper Sacramento River. Vapam, the trade name of the chemical, is used on agricultural land. It kills all biological activity: weeds, bacteria, nematodes, and insects in the soil.

.... While metam sodium is "safe for humans to drink for short periods of time" at levels of 1 part per million (ppm), levels of 0.1 ppm kill fish. In fact, this level is the outer limit of detection. This raised serious questions about the integrity of the supply of the Bay Area's drinking water, since the Upper Sacramento is the fountainhead of that supply.

Foliage drooped down and lost all sparkle and a hank of grass at the edge of the water had given up and flopped over into the water. .... What should have been green moss was dead and brown and slimy. Native brown and rainbow trout littered the bottom of the streambed and remained jammed into the crevices of the rocks... A thin bubbling scum, like soap detergent, coated an eddy that might normally hold a dozen feeding trout. You could turn over rocks and find hundreds of dead aquatic insects: hellgrammites, stone flies, caddis larvae; everything was dead. A pair of mud dogs, large salamanders, nestled in a pocket of shallow water. Wasps and yellow-jackets, carnivores after dead meat, lined the edges of the water like miniature vultures. We dug into the wet sand along the bank and found nothing stirring. Much of the algae on the rocks had burned off, leaving an red iron oxide patina. The air smelled like a septic tank. The water was unusually clear, with none of the color associated with good fishing. We did not at first notice one striking fact when we visited the river a week after the spill, the implications of which sank in slowly. None of the dead fish in the river had begun to decompose. They were as bright as if you "had just landed them. There was nothing there to nibble their corpses, no bacteria to rot them.
INCIDENT REPORT

Kelso, California, January 12, 1997
Union Pacific High Speed Derailment

Source: Testimony of Jim Hall, Chairman National Transportation Safety Board before the Committee on Appropriations Subcommittee on Transportation and Related Agencies, House of Representatives, Regarding Fiscal Year 1998, Budget Request, March 11, 1997.

A Union Pacific freight train derailed 68 cars near Kelso, California. The derailment occurred on a descending 2.2% grade at 72 miles per hour while the train was in a runaway condition. The train's authorized speed was 15 miles per hour. The train consisted of three locomotive units and 75 loaded covered hopper cars. Total damage was estimated at $4,377,250. Issues being looked into as a result of this accident include: the location of safety sensitive devices within a locomotive control compartment; car/train weight; dynamic brake requirements; retainer valve procedures; and operational speeds.

INCIDENT REPORT

Leadville, Co February 21, 1996
Southern Pacific Railroad Derailment, Gas Cloud, Evacuation


Two of 25 derailed cars were reported to be leaking sulphuric acid onto nearby Highway 24. A toxic gas cloud was reportedly formed as the spilled sulphuric acid mixed with snow and began to react. Two railroad employees were killed in the derailment, at least one person was admitted to the nearby Vail Valley Medical Center with respiratory difficulties, and several others were treated for eye and breathing irritation. Several nearby homes and businesses were evacuated as a hazardous materials spill team attempted to control the spill and limit the spread of the gas cloud.
INCIDENT REPORTS

RENO AREA INCIDENTS

Source: Cahill, C., Washoe County District Health Department. Memorandum to Jerry Hall regarding railroad issues, February 28, 1996.

Washoe County, Nevada (where Reno is located), recorded more than 20 hazardous materials incidents in the last nine years. The following are examples cited by County Health Officials:

♦ Two trains of liquid petroleum gas (LPG) derailed in the Sparks railyard. Despite the derailment, another train — containing several railcars loaded with explosives — rolled right up next to the train.

♦ Two large spills occurred with phosphoric acid — about 6,000 gallons each. These spills were caused when tanks failed. In one instance, the tank car had been leaking the acid as it had traveled from 20 miles to the east.

♦ In several instances ammonia leaked from trains. Apparently pressure valves released due to changes of elevation caused by passage through elevated local terrains.

♦ On a Thanksgiving morning a fuel truck got stuck on the tracks and was hit by a train. The fuel tank was ruptured. Burning fuel poured down the tracks for 1/4 mile.

♦ A boulder rolled down a hill as a train passed, tearing a hole in the diesel tank of a locomotive. Fuel was sprayed lightly along an extended area of tracks before the rupture was discovered.
Hazardous Materials on the Rails

A CASE STUDY OF THE UNION PACIFIC RAILROAD: THE NATION'S LARGEST CHEMICAL HAULER
HAZARDOUS MATERIALS ON THE RAILS: A CASE STUDY OF THE UNION PACIFIC RAILROAD

OVERVIEW

The amount of hazardous materials being shipped by rail grew 25% in the early 1990's and is expected to continue its growth in the coming years. Rail transport presents the potential for derailment or collisions leading to large scale disaster, involving multiple tank cars of extremely hazardous chemicals. This report examines the hazards of rail transportation through a case study of the nation’s largest chemical hauler, the Union Pacific Railroad.

Hazardous Material shipments by rail rose 25 percent in the early 1990's. Rail shipments are expected to continue to climb in the late 1990's, partly spurred on by the merger of the Union Pacific and Southern Pacific Railroads. Source of data: American Association of Railroads, Bureau of Explosives, Annual Report on Rail Shipments, 1996.
Hazardous Materials on the Rails

Background on Chemical Transportation and Safety Trends on the Railroads

Industry-wide, the number of rail shipments of hazardous materials has been rising steadily -- from 1,404,203 tank car shipments in 1990 to 1,785,547 in 1995 (most recent year available from American Association of Railroads). ¹

There are two categories of hazardous materials incidents that are reported on the rails — accidents and nonaccident incidents (nonaccident releases). "Accidents" include situations such as derailments, collisions, railcars catching fire, explosions or other occurrences which cause a death. Nonaccident incidents, which are more common, entail any other instances in which chemicals are released to the environment. Most of the nonaccident incidents involve smaller releases of materials, under 100 pounds, though many entailed substantial, hazardous leakages of toxic, flammable or corrosive materials into the environment.

The number of non-accident releases has risen steadily, roughly in proportion to, but slightly slower than, the growth in chemical railcar shipments. In addition, the number of haz-mat railcars involved in accidents has also risen.

However, the number of reported releases during accidents from 1990 to 1995 held roughly even. One apparent reason for the lack of increase in accident-related releases, while nonaccident releases increased, was that the steady rise in rail shipments has been accompanied by tank car design changes, mandated by federal regulations which mitigate against a corresponding increase in chemical releases during accidents. These devices include head shields and shelf-couplers, two design features that help to minimize the likelihood of tank ruptures during a derailment.²

Thus, while the number of accidents involving hazardous materials cars climbed roughly in proportion to the increase in rail shipments, the number of those accidents involving a release of the hazardous materials held about even during the same time


² Most recently, new regulations published in DOT docket HM-175A became effective on July 1, 1996. The new regulations require full-tank head protection for aluminum and for nickel alloy tank cars, and tank cars previously authorized to transport flammable gases without full-tank head protection are now required to have this protection; all poison by inhalation materials will be prohibited in non-pressure tank cars; and many environmentally harmful materials are required to be moved to tank cars that have better accident performance records. Source: NTSB "Most Wanted" Safety Improvements information posted on NTSB website.
period. After 1991, the number of releases during accidents seemed to hover at around 30 each year. (See accidents table.)

In contrast to the trend in releases during accidents, nonaccident releases climbed steadily for the rail industry as a whole, though slightly slower than the growth in the number of rail shipments. Most of these occurred due to mechanical failures on tank cars, or leaks from diesel tanks on locomotives. The total "nonaccident" releases industry-wide were 1,195 releases in 1991, rising to 1,297 in 1995; tank car leaks accounted for the greatest portion of these releases — 975 in 1991, rising to 1,120 by 1995.

In 1995, 1300 mechanical releases were reported from all rail carriers according to the American Association of Railroads. Of these reported incidents, 1120 were from tank cars. Of the total number of nonincident releases, the largest causes were defective fittings 897 (69%) and faulty pressure release devices 377 (29%). The industry reports that the largest portion of the rise in nonaccident releases occurred due to burst rupture disks on tank cars carrying corrosive materials. The railroads expect that various actions will reduce the number of these incidents in the late 1990's.³

<table>
<thead>
<tr>
<th>HAZARDOUS MATERIALS ACCIDENTS ON ALL RAIL CARRIERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>--in which a Haz Mat Car was Damaged or Derailed:</td>
</tr>
<tr>
<td>--involving a release:</td>
</tr>
<tr>
<td>--resulting in an Evacuation:</td>
</tr>
<tr>
<td>--number of Cars Releasing Hazardous Materials</td>
</tr>
</tbody>
</table>

Source: American Association of Railroads

## Tank Car Loadings and Leaking Tank Cars

### All Rail Carriers

#### 1995 Car Loadings by DOT Hazard Class

<table>
<thead>
<tr>
<th>Hazard Class</th>
<th>Total Tank Car Loads</th>
<th>Total All Car Loads</th>
<th>Leaking Tank Cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosives</td>
<td>1</td>
<td>4,964</td>
<td>0</td>
</tr>
<tr>
<td>Flammable Gas</td>
<td>213,374</td>
<td>214,247</td>
<td>99</td>
</tr>
<tr>
<td>Non-Flammable Gas</td>
<td>80,354</td>
<td>91,576</td>
<td>127</td>
</tr>
<tr>
<td>Poison Gas</td>
<td>62,437</td>
<td>62,521</td>
<td>20</td>
</tr>
<tr>
<td>Flammable Liquid</td>
<td>263,794</td>
<td>274,233</td>
<td>288</td>
</tr>
<tr>
<td>Combustible Liquid</td>
<td>46,309</td>
<td>49,973</td>
<td>69</td>
</tr>
<tr>
<td>Flammable Solid</td>
<td>24,600</td>
<td>27,446</td>
<td>2</td>
</tr>
<tr>
<td>Oxidizer</td>
<td>8,941</td>
<td>42,584</td>
<td>13</td>
</tr>
<tr>
<td>Organic Peroxide</td>
<td>0</td>
<td>46</td>
<td>0</td>
</tr>
<tr>
<td>Poison B</td>
<td>29,193</td>
<td>36,708</td>
<td>14</td>
</tr>
<tr>
<td>Radioactive Material</td>
<td>0</td>
<td>444</td>
<td>0</td>
</tr>
<tr>
<td>Corrosive Material</td>
<td>268,870</td>
<td>277,399</td>
<td>442</td>
</tr>
<tr>
<td>Miscellaneous (class 9)</td>
<td>136,259</td>
<td>200,993</td>
<td>34</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>5,295</td>
<td>14,668</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: American Association of Railroads
Background on Union Pacific Railroad's Transport of Chemicals

In the last two years, the Union Pacific Railroad merged with the Chicago and Northwestern railroad (1995) and the Southern Pacific Railroad (1996). Thus today it is the largest railroad in the US\(^4\) — and also the nation’s largest hauler of chemicals.\(^5\) Union Pacific operates a fleet of 2,100 train cars daily. The company’s 36,000 miles of track span 23 states, out of a total of 123,000 miles of rail tracks in the US.\(^6\)

The railroad transports chemicals through most of the continental US west of the Mississippi River, with much of the products transported originating along the Gulf Coast in Texas and Louisiana. The company’s chemical shipping business accounts for more than 40% of the entire market for rail chemical transport.\(^7\) With the merger of Union Pacific and Southern Pacific, the railroad expects to increase its shipping business by diverting traffic from other trucking and train carriers, resulting in over six million train-miles of additional traffic per year.


\(^6\)Union Pacific, 1996 Annual Report to Shareholders, letter from Chairman Dick Davidson.

\(^7\)Union Pacific, Chemical Transportation Safety, op cit., p. 1.
The railroad has not reported what portion of this growth will involve increased hazardous materials and chemical hauling, but it is likely include this high profit commodity area. About 18% of Union Pacific's commodity revenue is attributable to its shipment of chemicals — yet total chemical shipments represent only about 12.3% of UP shipments (revenue ton-miles). Union Pacific's commodity revenues from chemicals are over $1 billion annually.8

1991-1995 Union Pacific and Southern Pacific together averaged around 400 chemical release incidents per year, including both major and minor releases. 1993-1996, Union Pacific experienced 28 accidents (derailments, collisions, etc.) in which hazardous materials were released to the environment.

On chemical accident safety, Union Pacific's record has been slightly better than the industry average. While the rail industry as a whole has been holding about even on accident releases and slightly increasing the number of nonaccident releases, Union Pacific was slightly decreasing its reported nonaccident releases from 1993-1996. (Given the sharp increase in accident-related releases in 1995 followed by a decline in 1996, it is premature to identify a trend for UP in accident-related releases.)

One area where the railroad has made identifiable progress is in reducing derailments. In 1988 UP had 4,761 derailments, costing the company $84 million. By 1992 the number of derailments had been reduced to 2,910, at a cost to the railroad of about $30 million.9 Despite an increase in hazardous materials shipments, from 352,677 in 1993 to 439,796 in 1996, the number of derailments involving hazardous materials dropped by nearly 50% during the same time period (from 144 to 73).10

Union Pacific has also been working with shippers to reduce the number of nonaccident hazardous materials incidents. As Mark Johnson, Chemical Transportation Safety Manager in Union Pacific's Livonia railyard told us, "The railroads used to have a problem with disks rupturing on tank cars but now that they are allowed to use heavier disks the problem is being reduced. We are working with our shippers to reduce other types of incidents. Before and after problems occur, we have been

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8Union Pacific 1996 Annual Report.


10Union Pacific, Chemical Transportation Safety, Summary of Activities, 1996.
Nonaccident Releases on Union Pacific

Number of Releases

<table>
<thead>
<tr>
<th>Year</th>
<th>1993</th>
<th>1994</th>
<th>1995</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>357</td>
<td>397</td>
<td>391</td>
<td>340</td>
</tr>
</tbody>
</table>

Despite the safety improvements, on average there is a chemical release somewhere on the Union Pacific railroad almost every day. Eleven times in 1995 and five times during 1996 UP rail cars released chemicals during accidents. Some of the rail accidents and incidents reported as recently as the summer of 1997 (chronicled in the Incident Reports section of this report) caused deaths in collisions, disrupted host communities, and posed dangers to the environment and public health and safety. The Union Pacific Railroad still has a long way to go to be a good neighbor and safe employer.

Is the release of chemicals, occurring almost every day on the UP railroad, a simple fact of life, or can the railroad do better? Can intervention by government, workers and concerned citizens help to make Union Pacific chemical shipments safer, during a time in which the railroad is expected to continue to increase chemical shipments as a result of the merger?

We examined recent literature and government records, conducted database searches, and communicated directly with rail employees, rail neighbors, and local officials. Our modest research effort could only scratch the surface, and should not be taken as a comprehensive assessment of Union Pacific nor a comparative assessment of

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the various carriers or rail lines. However an examination of issues arising at Union Pacific, as the largest chemical hauler, provides an important case in point from which to identify issues of concern with respect to the hauling of hazardous materials on the rails. From our review we conclude that further investigation and action by local citizens and federal, state and local officials is appropriate to evaluate and enhance safety on the railroads generally, and at Union Pacific in particular.

In this report, we:

♦ identify causes for concern on the rails (Chapter 1);
♦ assess potential impact zones of worst case rail accidents (Chapter 2);
♦ provide a case study of Union Pacific in Reno, NV (Chapter 3);
♦ describe why neighbors and workers need to know more (Chapter 4);
♦ describe the process of oversight of the UP/SP merger by the Surface Transportation Board which has been called biased against the public interest by many observers (Chapter 5);
♦ provide conclusions and recommendations (Chapter 6), including how local citizens, workers and officials can take action to protect their communities, and how the federal government can act to enhance safety on the rails.

### Categories of Chemicals Hauled on Union Pacific Trains
1995 Carloadings

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermediate chemicals*</td>
<td>40%</td>
</tr>
<tr>
<td>Soda ash for use in steel related industries</td>
<td>11%</td>
</tr>
<tr>
<td>Plastic compounds</td>
<td>19%</td>
</tr>
<tr>
<td>Liquid Petroleum Products</td>
<td>13%</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>7%</td>
</tr>
</tbody>
</table>

*This category includes many of the most hazardous chemicals.*
Chapter 1
Causes for Concern on the Rails

Union Pacific Chemical “Incidents” Nearly Every Day

On average, the UPRR has a chemical incident involving a release of chemicals every day. Union Pacific and Southern Pacific together reported 2,090 hazardous materials incidents for the five year period 1991-1995. These incidents of unintentional releases were due to a variety of causes, including accidents and wrecks, leaking containers and locomotive fuel tanks and faulty valves. If the number of rail car shipments of chemicals on Union Pacific increases in the coming years, as anticipated, the railroad will face increased challenges in continuing to reduce the number of releases experienced.

Periodic Disasters on the Union Pacific Rail Line

The Union Pacific Railroad suffers periodic disasters and near disasters. In 1996 Union Pacific trains carrying hazardous materials derailed 73 times. In five of those incidents, toxic chemicals were released during the derailment. In the summer of 1997, the railroad experienced two collisions of its freight trains killing five people, and causing an evacuation of 1,100. It also experienced at least one additional near collision.

A Surprise Inspection Finds 37% of Rail Cars Defective

An unannounced inspection in February, 1995 of a Union Pacific railyard in Fort Worth, TX found 265 cars with safety defects, including 96 with brake problems. Out of a total 720 cars in the Union Pacific yard, the inspectors from the Federal Railroad Administration uncovered a defective rail car rate of 37%. The presence of defective cars — regardless of whether they are chemical tankers — may affect the safe passage of all cars carried on a single train.

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12US Department of Transportation, Hazardous Materials Incidents by Year and Mode, Printout, generated for the Good Neighbor Project by DOT, 3/19/1997.


15Loeb, P., “Running off the Rails; spotty safety: why trains are more dangerous than planes,” U.S. News and World Report. 120(21). (pp. 40-48), May 27, 1996.
## Combined Record of Union Pacific and Southern Pacific Railroads' Chemical Release Incidents reported to US Dep't. of Transportation*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Chemical Release Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>402</td>
</tr>
<tr>
<td>1992</td>
<td>396</td>
</tr>
<tr>
<td>1993</td>
<td>481</td>
</tr>
<tr>
<td>1994</td>
<td>438</td>
</tr>
<tr>
<td>1995</td>
<td>372</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,090</td>
</tr>
</tbody>
</table>

*Source: Printout obtained by Good Neighbor Project from US Department of Transportation.
Fewer, More Exhausted Workers Per Railcar Shipment

In 1985, Union Pacific hauled 3.2 million rail car shipments. By 1995, 5.7 million rail cars were being hauled by Union Pacific, a sixty-seven percent increase in ten years. But concurrently, Union Pacific downsized its workforce from 37,600 workers in 1985 to 33,400 by 1995. \(^{16}\) Downsizing the workforce, increasing rail car shipments, Union Pacific has increased the ratio of car shipments to workers. Whereas in 1985, the ratio was 85 rail car shipments per worker, the ratio doubled by 1995 to 170 rail car shipments per worker. \(^{17}\)

<table>
<thead>
<tr>
<th>Year</th>
<th>Approximate Number of Rail Car Shipments (millions)</th>
<th>Number of Employees</th>
<th>Ratio of Car Shipments to Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>3.2</td>
<td>37,600</td>
<td>85:1</td>
</tr>
<tr>
<td>1995</td>
<td>5.7</td>
<td>33,400</td>
<td>170:1</td>
</tr>
</tbody>
</table>

Rail workers and union representatives we spoke with suggested repeatedly that Union Pacific and other rail carriers’ staffing practices are leading to a dangerously exhausted workforce.

According to Scott Olson, spokesman for the United Transportation Union in Arizona, “Many railmen are never fully rested because of understaffing of the rail lines — this leads to serious risks of derailment or other incidents due to poor judgment. In the Phoenix area for instance, employees are working 12-hour shifts after resting only ten hours. We have lately had people going to the hospital with heat exhaustion, because they do not have enough time to recover after a shift. This makes the trains unsafe to everyone because it increases the risk that somebody is going to have a lapse and do something dangerous.” \(^{18}\)

Added J.M. Brunkenhoefer of the national office of the United Transportation Union, “Getting two workers to do the jobs of three can save a lot of money in fringe benefits but it creates some very tired workers — they live their lives as if they were ‘jet


\(^{17}\)Ibid.

\(^{18}\) Personal Communication with Scott Olson by Sanford Lewis, July 3, 1997.
lagged all the time. People who never know when they are going to work or get time off get tired and they can make bad decisions. It is unfair for a railroad to blame a train crew by calling it employee error in those circumstances."\textsuperscript{19}

While most of the rail lines may be increasing their railcar to staff ratios, "All of this is more serious on the Union Pacific because they haul the most hazardous material," said Brunkenhoefer.\textsuperscript{20}

In addition, the railroads did away with the use of cabooses at the end of almost all trains in the 1970's and 1980's. This economizing move means that there is normally no-one taking up the rear on the train — no-one, for instance, to smell a chemical leak or brake failure in the works, or to notice irregular movement of the train cars. The railroads have shifted to reliance on high tech monitors to measure the safe transit of their trains. But these monitors can be subject to mechanical failure, according to Olson.\textsuperscript{21}

**Employees Question Adequacy of Train Crews' Chemical Preparedness Training**

The Union Pacific Railroad reports in its 1996 Summary of Activities on Chemical Transportation Safety that it has a total of twelve full-time chemical transportation safety managers in the field, assigned to cover different regions in the US, and an additional 12 special agents with police duties to augment the managers. The railroad reports that prevention activities in 1996 focused on "tank car inspections, billing audits and electronic data interchange activities, employee training and customer interaction."\textsuperscript{22}

In particular the railroad stated that during 1996 it trained 20,289 employees on hazardous materials matters.\textsuperscript{23} According to Lou Wagner, Union Pacific's General Director for Chemical Transportation Safety, the company annually puts a group of employees through a day-long training on issues such as what makes a key train (chemical train), how to recognize hazardous materials placards, and what to do in the

\textsuperscript{19}Personal Communication with J.M. Brunkenhoefer by Sanford Lewis, July 3-4, 1997.

\textsuperscript{20}J.M. Brunkenhoefer, op cit.

\textsuperscript{21}Scott Olson op cit.

\textsuperscript{22}Union Pacific, Chemical Transportation Safety, op cit., p. 2.

\textsuperscript{23}Union Pacific, Chemical Transportation Safety, op cit., p. 3.
event of a hazardous materials emergency. In the event of an emergency, train crews are taught to notify dispatchers, and to share the shipping “consists” with emergency responders.24

However, field employees and their representatives express concerns about employee readiness for hazardous materials incidents, and the adequacy of the type of training most railway men and women receive. According to Olson, “most employees of Southern Pacific have not been given adequate training to respond if the train they are driving has a chemical accident. Instead, they have just been given a safety book and told to read it and then take a test. This does not leave them well-prepared in the event a chemical derailment or valve leak occurs.”25

Paul Morrison, Chairman, State Legislative Board, Brotherhood of Locomotive Engineers, California, and a Union Pacific engineer, also expressed concerns. “We are given a test once a year where we are asked half a dozen hazardous materials questions, but the railroad gives us no hands on training. We know where to go to get info to relay to the hazardous materials response teams, but if we find a chemical tanker derailed or smell it leaking we are simply supposed to back away and notify the dispatcher.”26

Olson relates an incident in which a tank car was venting liquid propane gas in a railyard in the middle of Phoenix, due to overheating of its contents. An untrained employee was instructed to fix the problem. He went to repair it with a hammer — which, if struck against the steel car, could have caused a spark that could have ignited the gas vapors already pungent in the air. Fortunately, in that instance, a local fire official saw what was about to happen and intervened.27

The only really well trained people on the rail lines, says Olson, are the company’s floating incident response teams. These are the people who rush to the scene AFTER an incident occurs. But they are few and far between, and little if any training is given to rail employees focusing on prevention of chemical accidents or early detection of hazards or releases.28

24Personal Communication with Lou Wagner, General Director for Chemical Transportation Safety, Union Pacific Railroad, July 28, 1997.

25 Scott Olson op cit.

26Paul Morrison, op cit.

27 Scott Olson, op cit.

28 Scott Olson, op cit.
Paul Morrison notes that there is an overall reduction in experience required of train crews. "Along with the process of downsizing has come a reduction in the amount of training time for employees before their responsibilities are increased. Locomotive engineers used to be trained three to twelve years, now they can be promoted to that position within six months. This means that their training is based more on understanding of rulebooks than on experience. The years of training that used to be required were to ensure preparedness for difficult or unusual situations that arise periodically, and where experience can count. These are the kind of rare occurrences that also can lead to accidents."29

Morrison sums up his experience with hazardous materials preparedness: "The best hazardous materials advice I have ever received for locomotive engineers is to keep a pair of tennis shoes and binoculars in the train with you. If you sense something is wrong, use the binoculars to look back... and if something has gone wrong with a chemical tank car, put on the tennis shoes and run in the opposite direction. We don't have any other protective equipment."30

Dispatching Concerns Lead to Federal Directive

Rail line signals communicate important information to engineers and other personnel regarding track conditions, speed limits and dangers ahead. Of all the nation's rail line, 85% is considered "dark territory," lacking computerized rail line signals, where trains are given old-fashioned, radio-transmitted "warrants" to proceed through crossings without signals.31

In the early summer of 1997, Union Pacific had two train-train collisions and another near collision, causing the Federal Railroad Administration to raise questions and issue a directive related to dispatching.

In Devine, TX two UP trains collided head-on on June 22. Four people were killed. After this incident, the Federal Railroad Administration issued an alert which stated that:

"Preliminary investigatory findings following the head-on collision of two UP

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30 Paul Morrison, op cit.

31 Loeb, P., "Running off the Rails; spotty safety: why trains are more dangerous than planes," U.S. News and World Report. 120(21). (pp. 40-48), May 27, 1996.
trains on June 22, 1997 indicate that existing DTC [Direct Train Control, a method of authorizing train movements] procedures of carriers pertaining to the issuance of movement authorities need to be modified in order to reduce the risk of similar collisions.”

The nature of the error found on a preliminary basis by the FRA in the Texas incident was that a movement warrant of one of the trains to proceed from a side rail had apparently not adequately emphasized or conveyed the need to first await passage of the other train.32

32Department of Transportation, Federal Railroad Administration, Notice of Safety Directive, Federal Register, 4910-06-P, Monday June 30, 1997. The FRA stated that its preliminary findings were that:

“The UP accident occurred in single track, non-signaled TWC territory; timetable direction is northward and southward. A planned meet of a northward train (UP 5981 North) and a southward train (UP 9186 South), was to have occurred at a passing siding identified in UP’s operating timetable as Gessner. UP 5981 North was authorized by track warrant to operate to, and take the siding at, Gessner. UP 5981 North was also in possession of a second track warrant that authorized movement north of Gessner after the arrival of UP 9186 South. UP 9186 South was authorized by track warrant to operate to, and hold the main track at, Gessner. UP 9186 South was also in possession of a second track warrant that authorized movement south of Gessner, but the track warrant in possession of the train crew omitted a requirement to wait at Gessner until after the arrival of UP 9186 North. Consequently, UP 9186 South passed Gessner and approximately 13 miles south of Gessner, struck UP 5981 North head-on. The track warrants entered by the dispatcher into the computer dispatching system established that UP 9186 South was required to wait at Gessner until after the arrival of UP 5981 North. However, the transcript of the dispatcher’s radio communications established that the dispatcher authorized UP 9186 South to operate south of Gessner without instructions to wait at Gessner for the arrival of UP 5981 North.”

As a result, the FRA’s preliminary investigatory findings indicate that “direct train control procedures pertaining to the issuance of movement authorities need to be modified in order to reduce the risk of similar collisions.”

In addition, the safety directive states that, by July 5, 1997, railroad operating supervisors should personally contact each train dispatcher responsible for controlling train movements in non-signaled territory and inform the train dispatchers in face-to-face meetings of the circumstances surrounding the Union Pacific accident and requirements of this safety directive.

The safety directive also states that by July 3, 1997, each railroad should review its operating rules and practices for operations in non-signaled territory to determine if further safety improvements are warranted, and by July 3, 1997 each railroad should tell the FRA in writing about additional steps the railroad intends to take to improve the level of safety.
The FRA directive expressed concern about "possible gaps in existing train control systems that, due to inadequate operational testing or deficient operational procedures, can lead to train collisions...FRA has initiated an in-depth and comprehensive analysis of the operational tests and inspections programs and dispatching procedures employed by CSX and UP."³³

David Bolger, a spokesman for the Federal Railroad Administration, said that federal investigators are looking at many aspects of the railroad’s dispatching operations, including whether dispatchers' workload is too heavy and what hours the dispatchers work. Fatigue of dispatchers may be an issue. Training may need improvement. Years ago dispatchers used to ride trains to become familiar with the territory they handle. Now they watch a videotape to familiarize themselves with track.³⁴

Bolger also said that he was told by the FRA investigator that the stretch of track where the two UP trains crashed in Texas is handling about three times the number of trains it was designed for, an issue which Union Pacific officials later disputed.³⁵ Bolger said that while that stretch of rail might be physically able to handle the number of trains, he was referring to whether the amount of traffic in the area (under control of radio dispatchers), might put too much pressure on the dispatchers.³⁶

Two days after the Devine, Texas incident, a near collision again raised dispatching concerns when a UP dispatcher sent a coal train into the path of a Metra commuter train in Waukegan, Illinois. Rail officials said the coal train was mistakenly diverted into the path of Metra Train No. 342 to avoid a construction area. The opposing trains stopped about two miles apart.³⁷

And again on July 1 another collision of UP trains occurred. This time one rail employee was killed and the community of Rossville, KS was evacuated because of

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³⁶ Ibid.

concern about a potential chemical cloud. A spokesman for the Federal Railroad Administration, which had begun to evaluate UP practices after the Devine, TX incident, said, "Today's accident in Kansas sort of underlines our concern...Safety needs to be looked at much closer." 38 UP asserted that there were no signaling or dispatching problems in this incident and suggested a focus on train crew error, such as an employee failing to stop at a red light, or failing to apply the brakes soon enough. 39

To the workers on the rail line, the accidents and near misses have risen to the level of a safety crisis. The Brotherhood of Locomotive Engineers (BLE), which represents many UP employees, was set in June to launch a "safety strike" against Union Pacific for "problems with operating, dispatching and training for dispatchers," said regional chairman of BLE, Doug Davidson. 40 However, a court order in June 1997 stopped the threatened safety strike. The President of the AFL-CIO, John J. Sweeney reportedly responded by saying, "We will not be stopped in our campaign for safe working conditions...If necessary, we are prepared to engage in civil disobedience to save lives." 41

J.M. Brunkenhoefer, Legislative Director, United Transportation Union is one of the union officials charged with ensuring the enforcement of laws applicable to rail workers. He expressed concern after the recent crashes regarding the safety of the UP dispatching system. "A dispatch center is a lot like an air traffic control center. You

38 Tom Webb, "Rail accidents alarm federal officials; Even before the Rossville crash, regulators had requested a safety review." The Wichita Eagle, Wichita Eagle Online, July 2, 1997.


40 Jimenez, op cit..

have got to keep safety issues foremost. We must make sure that with mergers and the centralization of dispatching to centers that speed of delivery is not placed over safety. We have concerns [that] there be more focus on safety than on meeting schedules and market demands. People may be trying to do too much from one location."42

“In the past dispatchers rode the territory and knew different areas and what they looked like. Some still do it but not enough. They could picture the five mile curves and long hills and mountains in their minds and could understand what the trains were up against. Train dispatching cannot become a paperwork exercise."43

Scott Olson, State Legislative Director for the United Transportation Union in Arizona says that conductors and other rail personnel who are members of the UTU have observed increased problems with communication lately. “As the two railroads are being merged, there is a challenge of merging the separately designed signaling and computer systems. Personnel on the trains have lately experienced frightening episodes in which signaling or switching equipment seems not to be working. Engineers have been asked to retry their signal systems — an unusual occurrence which we suspect relates to the complications of the merger,” according to Olson.44

In the last year, the Brotherhood of Locomotive Engineers in California has filed five written and verbal complaints with the Federal Railroad Administration about the quality of dispatching from Union Pacific headquarters. Their complaints alleged that the style of dispatching is increasing employee fatigue and compromising the right to a safe working environment. They also allege dangerous incidents; for instance, that a dispatcher recently put a maintenance car in the path of another approaching train.45

**Safer Technologies Go Underutilized**

Some rail industry spokespeople assert that the reduction in ratio of workers to railcars is made up for by improvements in technology.46 For instance, a number of

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42 J.M. Brunkenhoefer, op cit.

43 J.M. Brunkenhoefer, op cit.

44 Scott Olson, op cit.

45 Paul Morrison, op cit.

46 “There are definitely fewer railroad employees than there used to be” says Carol Perkins of the Association of American Railroads. “But we’ve compensated for that by improvements in
safety functions of rail tracking and monitoring have been automated. Certainly the statistics show that improvements in tank car design, where applied, has reduced the likelihood of tank cars being ruptured in the event of an accident.

Yet a large portion of the rail system apparently remains in "dark" areas where automated signaling has not yet reached and dispatchers give radio-dispatched signals for trains to move. Safety mechanisms known as positive train separation devices (also known as proximity warning) which could automatically forewarn and stop trains in impending collisions are not widely deployed despite their availability, according to Brotherhood of Locomotive Engineers President Clarence Monin. Monin complains about the failure of Union Pacific to install these available safety technologies. "Not only our members, but the general public, is endangered because rail management has refused to upgrade technology to prevent these tragic accidents," Monin said. "If those trains were equipped with proximity warning devices, these collisions could have been avoided. The technology is available right now, and it is not expensive."47

Proximity warning devices are similar to equipment used by air carriers. They automatically warn pilots if they get too close to other airplanes. Monin noted that industry resistance and federal delays had prevented provisions for life saving devices urged for years by the National Transportation Safety Board. Positive train separation technology, first recommended by the NTSB in 1986, would warn an engineer if his or her train is in danger. If the engineer does not take corrective action, the system could activate the train's brakes to stop it immediately.48

Mislabeled or Unlabeled Tanker Cars

About 10% of Union Pacific's own inspections of 9,000 tank cars last year found "exceptions," ranging from unlabeled or mislabeled tank cars to leakage.

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47Press release of BLE, op cit.

48Press release of BLE, op cit.
"exceptions," ranging from unlabeled or mislabeled tank cars to leakage. The railway men and women themselves are often in the dark as to what they are carrying on their trains. "We carry every bad substance in the world... my own members don't know what is on the trains," said Scott Olson, a spokesman for the United Transportation Union in Arizona. He cites two problems.

First, "the consists (shipping forms that accompany the train) are often inaccurate," according to Olson. "One conductor recently found twelve hazardous materials cars on a train that he never knew were on there, and he had already gone from Chicago to El Paso without having this information! With inaccurate consists like those in that case, emergency responders would be unable to respond effectively if the train derailed or caught fire. In such instances, the best they may be able to do is let the train burn while waiting for the information about the tanker's contents to be clarified."

Secondly, there are some intermodal units on the trains — units transferred from truck to train — which contain poorly labeled, mixed cargo. Sometimes bizarre and dangerous mixtures are carried in these unsorted cars. "For instance, in one intermodal car," says Olson, "body parts (for disposal in a hospital waste incinerator) and toys were being carried together. In another box car, breakfast cereal, body parts and poison were being carried together in the same semi container and box car."
Grade Crossings -- The Right to Know of An Oncoming Train

Every year about 4,000 motor vehicles are involved in accidents at grade crossings. These accidents kill about 500 people, and they injure more than 1,800 people annually. Although two-thirds of all crossings are passive (have no train-activated devices), these crossings have rarely been targeted by Federal safety programs and research projects.

Don Ewing, emergency planning official of Point Coupee Parish, Louisiana, noted that disrepair of some grade crossing signals poses another danger as well. He said that even when there are signals at crossings, they're not always functioning properly, so people tend to get used to them malfunctioning, and come to ignore them.53

When grade crossing signals are not present, or even worse, are not properly maintained or functioning, the public may be in grave danger. For instance, Salvador Messina of Iberville, LA relates how he was driving home on a foggy evening in March 1997 when he almost collided with a Union Pacific Railroad freight train that was crossing the highway. Messina claims there were no signals, which is why he had no warning of the oncoming train. He managed to veer his truck into a gutter, where it was totaled. Messina is furious with the Union Pacific Railroad for apparently letting the signals fall into disrepair. He said he is more likely to know of oncoming trains from the dogs barking in the neighborhood than from the company's own signaling equipment.

Source: Personal communication, April 1997.

53 Personal Communication of Don Ewing with Heather Clish.
The Hazardous Materials Most Commonly Shipped by Rail
(All Rail Lines)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>1995 Carloads</th>
<th>Hazard Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquefied Petroleum Gas</td>
<td>157,424</td>
<td>explosive/flammable</td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>88,818</td>
<td>corrosive</td>
</tr>
<tr>
<td>Molten Sulfur</td>
<td>69,355</td>
<td>toxic</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>68,708</td>
<td>corrosive</td>
</tr>
<tr>
<td>Elevated Temperature Material</td>
<td>60,660</td>
<td></td>
</tr>
<tr>
<td>Anhydrous Ammonia</td>
<td>59,239</td>
<td>toxic</td>
</tr>
<tr>
<td>Chlorine</td>
<td>48,351</td>
<td>toxic</td>
</tr>
<tr>
<td>Methyl Alcohol</td>
<td>30,404</td>
<td>flammable</td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>27,208</td>
<td>flammable</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>25,773</td>
<td>corrosive</td>
</tr>
<tr>
<td>Fuel Oil (Class 3)</td>
<td>25,167</td>
<td>flammable</td>
</tr>
<tr>
<td>Denatured Alcohol</td>
<td>20,261</td>
<td>flammable</td>
</tr>
<tr>
<td>Styrene Monomer, Inhibited</td>
<td>18,362</td>
<td>toxic</td>
</tr>
<tr>
<td>Hydrochloric Acid</td>
<td>17,497</td>
<td>corrosive</td>
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<tr>
<td>Carbon Dioxide, Ref. Liq.</td>
<td>16,833</td>
<td></td>
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<tr>
<td>Fuel Oil (Combustible Liquid)</td>
<td>14,150</td>
<td>flammable</td>
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<tr>
<td>Ammonium Nitrate</td>
<td>11,373</td>
<td>explosive</td>
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<tr>
<td>Gasoline</td>
<td>10,774</td>
<td>flammable</td>
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<tr>
<td>Sodium Chlorate</td>
<td>10,696</td>
<td>toxic</td>
</tr>
<tr>
<td>Phenol, Molten</td>
<td>9,175</td>
<td>toxic</td>
</tr>
<tr>
<td>Butadiene</td>
<td>9,016</td>
<td>toxic</td>
</tr>
<tr>
<td>Methyl Tert Butyl Ether</td>
<td>8,960</td>
<td></td>
</tr>
<tr>
<td>Crude Oil, Petroleum</td>
<td>7,878</td>
<td>flammable</td>
</tr>
<tr>
<td>Adipic Acid</td>
<td>6,969</td>
<td>corrosive</td>
</tr>
</tbody>
</table>

WHICH OF THESE CHEMICALS ARE SHIPPED BY RAIL THROUGH YOUR COMMUNITY?

DO YOU HAVE A RIGHT TO KNOW?
A Union Pacific train carrying hazardous materials in Deer Park, TX reportedly went over a broken rail on July 23, 1997 at 5:15 AM. While no hazardous materials were released, the derailed train tumbled into a ditch and narrowly missed an exposed liquid petroleum gas pipeline. In the event the line had been struck, a large explosive fire could have ignited the railcars.


While UP/SP has had its share of disasters and tragedies, the railroad and its host communities have been fortunate that the worst has never happened. The various accidents that occur on UPRR combined with the safety concerns identified in Chapter 1 are forewarnings of a true disaster waiting to happen — for instance, in the event an accident occurs under unlucky meteorological conditions.

Chemical Accident Hazards

To aid in understanding the risks posed by rail transport of chemicals, we engaged in the initial stages of an exercise that all host communities on chemical shipping rail lines should be doing through their Local Emergency Planning Committees (LEPC’s). We prepared a general demonstration of the worst case accident zones for a rail tank car release. These accident zones are helpful in demonstrating the scope of planning needed — How will the community respond promptly and be prepared to take action if an area within the indicated size is jeopardized by a chemical accident?

As part of emergency planning, the EPA has recommended that LEPC’s prepare “worst-case scenarios” or require facilities under their jurisdiction to do so. Worst-case projections are used to indicate a zone of danger — the area in which deaths and injuries would be most likely to occur, and within which evacuation may be rendered difficult by the presence of toxic fumes. These scenarios typically consider the almost instantaneous release of the entire amount of a chemical from a single storage or transport unit, and assume the failure of safety and mitigation devices. Unfortunately, not all LEPC’s have engaged in such an exercise and planned for the needed level of response activities. Indeed, doing such a review requires access to information that we were informed by representatives from two different Union Pacific communities that the railroad has not readily shared, namely, the substances and
volumes shipped on its various rail pathways.\textsuperscript{54}

In 1987, the EPA published a standard methodology to assist LEPC's, chemical facility planners and concerned citizens in estimating worst-case chemical accident scenarios. The key elements in evaluating worst case scenarios are identification of:

(a) the most dangerous chemicals transported through an area;
(b) the largest and fastest release that could be anticipated and
(c) populations and areas that could be exposed.

Our analysis indicates that people within a 10 mile radius -- and possibly even those further away than that -- could be endangered in a worst case chemical accident.

(a) Dangerous Chemicals: Capacity to Form "Ground Hugging" Toxic Clouds

While the railroads convey hundreds of different chemicals, as well as nuclear materials, in evaluating worst case accident scenarios for rail lines, one needs to examine the potential for a release that could most easily expose large populations to toxic levels of materials. One way this could happen is through chemicals which are capable of forming a dense, ground-hugging chemical cloud. Two substances which are shipped by rail that meet this criterion are:

\begin{itemize}
  \item **Chlorine** In high concentrations (e.g., in an accident) chlorine can act as an asphyxiant and cause respiratory distress, chest pain, loss of breath (leading to death), vomiting, filling of the lungs with fluid (pulmonary edema), and pneumonia. Effects of chlorine exposure, which can occur after single high concentration exposures, include: disease of the bronchi, chronic airway obstruction, and asthma.
  \item **Hydrogen Fluoride** Hydrogen fluoride is a highly corrosive, colorless, fuming liquid or gas with a strong irritating odor. Hydrogen Fluoride (HF) is considered a Special Health Hazard because even slight contact with the chemical can cause severe skin and deep tissue burns, which may occur hours after contact and may not be felt immediately; severely burn the eyes, causing blindness; irritate the nose, throat, and lungs, causing coughing and/or shortness of breath; or cause the build up of fluid in the lungs (edema). Chronic effects of exposure to HF include: bronchitis with cough, phlegm and/or shortness of breath, and damage to the liver and kidneys. Hydrogen Fluoride is believed to have a
\end{itemize}

\textsuperscript{54}Personal Communications with Don Ewing, Press Clewe, and Wilma Subra.
special capacity to form a self-regenerating toxic cloud that can remain at deadly densities despite the movement of the cloud over long stretches of land.55

(b) Amount of Materials and Timing of Release

For rail incidents, a simple means of projecting worst-case scenarios is to estimate the release of the contents of the largest rail tank car of a given substance likely to be present on the rail line. Tank cars can range in size. According to the Federal Railroad Administration, the maximum gross weight on rail for a tank car is 263,000 lbs. According to USEPA, the largest size for a tank car of anhydrous hydrogen fluoride is 91 tons (or 182,000 lbs.) Thus, a single large tank car can thus carry approximately 200,000 lbs of a hazardous chemical.

(c) Areas and Populations At Risk

For rail accidents, we projected a worst case accident for each chemical of concern (chlorine and hydrogen fluoride) based on the complete release of a tank car's contents within ten minutes.

Our analysis demonstrates that anyone who lives, works, plays or travels within ten miles of a chemical shipping rail line certainly could be within the zone of danger. People within closer proximities to the rail lines are in proportionally greater danger; people beyond ten miles could also be jeopardized in extraordinary events.

In the event that a ten mile zone were actually to be inundated by a chemical cloud in a rail accident, it is doubtful that the existing preparedness efforts by host communities that we evaluate in chapter 4 of this report will suffice to prevent unnecessary casualties and injuries. Additional emergency planning and preparedness, including full disclosure of past shipping, advance notice of extremely hazardous shipments, worst case assessments, state of the art alert systems, and a well-rehearsed emergency plan ought to be baseline requirements for host communities of Union Pacific railroad, the largest chemical hauler, and other chemical hauling railroads.

Chemical Accident Scenario

for 100,000 pound Tank Car
See Text for Explanation
Methodology of Worst Case Analysis

The vulnerability zone for hazardous substances such as Chlorine or Hydrogen Fluoride is calculated as the area considered immediately dangerous to life and health (IDLH). This is defined in technical methodologies as the area beyond which a healthy man could stand for 30 minutes and still expect a quick recovery. Since some populations such as the elderly and children are even more at risk, the IDLH represents an area of extreme danger for such a serious accidental release. We calculated a vulnerability zone based on release of a tanker of 100,000 lbs. of either substance. Some chemical tankers may exceed this size. Based on this analysis, the vulnerable zone, the area where people could be at risk of life and health in the event of a worst-case accident involving toxic substances transported by rail lines can exceed 10 miles. Such a vulnerable zone is typically shown on maps as a radius around the point of chemical release as wind direction at the time of the release and other atmospheric conditions will influence the direction of travel of the toxic cloud.

Our further analysis indicated that 10 miles is likely to be too conservative an estimate of the potential reach of an airborne toxic cloud. An additional worst-case analysis was conducted for chlorine and hydrogen fluoride using a Gaussian Plume model. The Gaussian Plume model is the most widely used and accepted method to calculate the reach of airborne pollution. The EPA method, for example, is based on a Gaussian Plume model. Based on a worst-case scenario release of 100,000 lbs. (10,000 lbs for 10 minutes) of either, individuals would be at risk of life and health more than 20 miles downwind. Individuals at between 30 and 40 miles downwind could be exposed to concentrations of either chemical that exceed short-term occupational health limits.

Except to the extent that we have undersized the release that can happen and its speed, such “worst case scenarios” reflect severe circumstances. But even a smaller release could pose serious risks to the life and health of residents surrounding a railyard or rail lines. For example, a 1000 lb release of chlorine could be dangerous to humans between 1.5 and 10 miles away, depending on wind conditions and the presence of obstructions such as tall buildings. A 1000 lb release of hydrogen fluoride could be dangerous to humans between 3 and 10 miles away.

Note that this analysis is based on a release involving one single rail car. In an actual train wreck, sometimes more than one chemical container may be breached (or caught on fire) thereby complicating the scenarios. We did not attempt to calculate the very worst that could happen with a variety of chemical containers breached and reacting together, or the potential impact of an accident involving a tank car larger than 100,000 pounds. These are activities which a local emergency planning committee should undertake with better information on materials flows from the railroad.

Sources of Technical Information: USEPA, Technical Guidance for Hazards Analysis: Emergency Planning for Extremely Hazardous Substance. The technical consultant to the Good Neighbor Project for this analysis was Joel Tickner, M.S.
Nuclear Transportation Hazards

In addition to hazardous chemicals, the railroad also ships nuclear materials. Indeed, as noted earlier there is likelihood that the railroad will be called upon to ship high level nuclear wastes, including wastes coming from other countries. A California-based locomotive engineer told us, “We are carrying everything and anything through most of the UP rail lines. From propane to nuclear waste to chocolate syrup. We even carry bombs.....We have heard from the railroad that we should expect to soon be hauling several hundred car loads of nuclear materials. We understand it will come from a foreign port. They haven’t told us exactly when and where we will be carrying it.”

Among the most dangerous nuclear materials shipped are spent nuclear fuels. While the route of travel is not yet known, there is an anticipated shipment of spent foreign reactor fuels on some Union Pacific lines beginning as early as spring 1998. The United States has an agreement with some foreign governments to handle other countries’ wastes.

Based on the 1971-1990 accident data, US Department of Energy has calculated accident and incident rates for commercial spent fuel shipments to a repository. For rail shipments, DOE calculated 9.7 accidents and 19.4 incidents per million shipment miles.

The DOE also commissioned a study in 1985 which concluded that a severe accident might involve a release of fuel and/or particles mixed with smoke accompanying a fire. These particles could be inhaled or contaminate the food chain. The 1985 DOE contractor report assumed a severe impact followed by a massive fire fed by large quantities of fuel. Release of only a small fraction (1380 curies) of the cask’s contents would be sufficient to contaminate a 42 square-mile area. The study also found that cleanup costs after such an accident could exceed $620 million. Cleanup after a similar accident in a typical urban area would be more expensive and time-consuming (perhaps $9.5 billion just to raze and rebuild the most heavily contaminated square mile).

56 Paul Morrison, Chairman, State Legislative Board, Brotherhood of Locomotive Engineers, California, telephone interview by Sanford Lewis, July 16, 1997.


58 Nevada Agency for Nuclear Projects, Fact Sheet on Nuclear Shipping.

59 Source: Nevada Office on Nuclear Waste, “Fact Sheet, Transportation of Spent Nuclear Fuel and High-level Radioactive Waste to a Repository” from Nevada Office on Nuclear Waste
web page. An alternative analysis by an Agency contractor estimated cleanup costs for the same rural accident ranging from $176 million to $19.4 billion, depending primarily upon permissible post-accident soil concentrations of cobalt-60, cesium-134, and cesium-137, and upon regulatory requirements for disposal of the contaminated soil.
Chapter 3

CASE STUDY: RENO, NEVADA CONTENDS WITH RAIL LINE GROWTH

The city of Reno, NV is engaged in a pitched legal battle with Union Pacific over its plans to increase freight traffic through the city's downtown as a result of the merger. The city filed lawsuits against the Union Pacific and the Surface Transportation Board (the agency charged with overseeing the UP/SP merger) in two federal courts, alleging that the government should have required a full Environmental Impact Statement (EIS) on the impacts of the merger. See chapter 5 for additional discussion of the STB, and chapter 4 for a discussion of emergency planning in Reno.

The rail line passes directly through the downtown casino area of Reno, creating safety hazards for pedestrians and motorists, generating noisy horn blasts at all hours of the day and night, and causing gridlock of traffic while all must wait for the trains to pass. As a result of the merger, the number of freight trains passing through that congested area is expected to double.

The city's preferred solution appears to be for the railroad to, among other things, depress the trainway through the downtown area, at a cost to Union Pacific of approximately $182 million. This would end the stoppage of downtown traffic at grade crossings, even if the number of trains increases as planned. In July the U.S. Secretary of Transportation Rodney Slater reportedly said that the railroad merger issue is a high priority, and he agreed to immediately facilitate discussions between the railroad and the city of Reno regarding mitigation measures, including depression of the railway.

Some train personnel themselves experience personal dread at the current arrangement of riding their trains through the crowded downtown Reno area. An engineer who often brings a UP train through Reno told us, "I believe that train crews are in danger of being made victims of a standoff between the railroad and the city of Reno. The railroad was there first and the city built up toward it. But now it is just too dangerous to ride our trains through that congested pedestrian area. The railroad and the cities of Reno/Sparks either have to lower the tracks or elevate them, or move them out of there. Otherwise we will surely see more engineers and pedestrians

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victimized.\textsuperscript{62}

Concerns of the city of Reno regarding increased chemical transportation include the following:

\begin{itemize}
  \item As the amount of chemical traffic through Reno increases, so will the threat of rail accidents and drinking water contamination incidents;
  \item A serious release incident could affect 60,000 or more people typically situated in the downtown casino area\textsuperscript{63};
  \item Videos taken by the city's consultants demonstrate that some of the tank cars passing through appeared to lack placard markings to indicate what chemicals they contain;\textsuperscript{64}
  \item Reno is one of a few possible rail routes for transportation of high-level nuclear wastes, including reactor waste imported from other countries as early as 1988. While the state of Nevada opposes the shipment of such wastes through Reno, there are no assurances that Reno will not ultimately be chosen as the route. High level nuclear transport is of special concern since the public may be exposed to radiation by these shipments \textit{even without an accident}. Radiation is not completely contained by the packaging. It is possible for individuals close to a container for extended periods to receive radiation exposures significantly in excess of background levels. Such exposures are possible, for example, in the event of a gridlock incident where a rail car is stopped at a crossing with occupied motor vehicles halted in proximity to the train.\textsuperscript{65}
  \item Reno's emergency response program is handicapped by the railroad's lack of cooperation. There is no advance notification given to local government or the public when severely hazardous materials or even nuclear materials are being moved through the area. Emergency responses can be made more difficult by the
\end{itemize}

\textsuperscript{62}Paul Morrison, Chairman, State Legislative Board, Brotherhood of Locomotive Engineers, California, telephone interview by Sanford Lewis, July 16, 1997.

\textsuperscript{63}Interview with Mark Demuth, Principal, MADCON Consultation Services, June 10, 1997.

\textsuperscript{64}Ibid.

A Union Pacific chemical tank car traverses downtown Reno. Traffic and tourists come to a standstill waiting for the lengthy train to pass. Reno calls itself “The Biggest Little City in the World.”

fact that the railroad divides the northern and southern sections of the downtown area. A derailment or other incident could make an area impassable for emergency responders. Local emergency responders also lack sufficient equipment and effective plans needed to prevent the loss of lives or the contamination of water supplies in the event of a major hazardous materials incident.\textsuperscript{66} More on emergency planning in Reno, Chapter 4.

\textsuperscript{66} Interview with Press Clewe, Director, Washoe County Office of Emergency Response, June 1997.
HAZARDOUS MATERIALS IDENTIFIED BY RESEARCHERS AS SHIPPED BY RAIL THROUGH THE RENO AREA ON A SAMPLED DAY*

<table>
<thead>
<tr>
<th>Top Five Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
</tr>
<tr>
<td>Phosphoric acid, diesel or ammonium nitrate (tied)</td>
</tr>
<tr>
<td>Anhydrous ammonia</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
</tr>
<tr>
<td>Butyl Ether</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Substances Also Transported During the Sampled Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butane</td>
</tr>
<tr>
<td>Calcium carbide</td>
</tr>
<tr>
<td>Carbon Disulfide</td>
</tr>
<tr>
<td>Methyl Alcohol</td>
</tr>
<tr>
<td>Methyl ether</td>
</tr>
<tr>
<td>Naphtha</td>
</tr>
<tr>
<td>Potassium Hydroxide</td>
</tr>
<tr>
<td>Propane</td>
</tr>
</tbody>
</table>


**Lists were based on shipment manifests for Southern Pacific rail line on a single day - February 28, 1996, viewed as the best (only) available information. Additional disclosure by UPRR would be needed to better quantify the flow of hazardous materials through the city.
Chapter 4
WORKERS AND HOST COMMUNITIES HAVE A NEED TO KNOW MORE

The US General Accounting office has noted that a key reason for growth in chemical accident hazards in the US is the lack of public awareness of safety data:

“One of the major barriers to accident prevention is inadequate information and, perhaps most importantly, lack of demand for that information at the local, state, and industry level. Information from prior accidents is essential to take a ‘lessons learned’ approach in preventing future accidents. Furthermore, this information must be disseminated to community residents, state governments, and industry. However, as noted by EPA, the major challenge is to stimulate interest in accident prevention at these levels. Oftentimes, community residents and industry officials do not consider the importance of accident prevention until after an accident occurs, which severely limits the extent of accident prevention activities.”

Railroads Exempted from Community Right to Know Laws

While information about fixed industrial sites is becoming more available due to the passage of Right to Know laws, neighbors of railyards and rail lines remain largely in the dark as to the hazards they are facing. While federal law provides information about maximum inventories of materials stored onsite under section 312 of the Emergency Planning and Community Right to Know Act (EPCRA), hazardous materials under active shipping papers (i.e., on rail lines) are excluded from reporting. This lack of a requirement that railroads publicly disclose hazardous materials flows and storage represents a major loophole in EPCRA, which was designed to protect the public from chemical accident hazards.

Citizens and workers have a need to know what hazardous substances are passing through their neighborhoods and how they might be affected in the event of a serious accident or release. Citizens need information on hazardous materials flows and storage in their neighborhoods so that they can better participate in local decisionmaking on ways to reduce and eliminate the hazards to which they are exposed.
Local Chemical Emergency Planning May Be Inadequate in Many Rail Host Communities

In addition to the Right to Know reporting requirements such as the inventory reporting requirement, EPCRA also established various authorities and mechanisms for chemical accident planning which theoretically must include rail transportation issues. On a local level, Local Emergency Planning Committees (LEPC's) were given the task of collecting data on the presence of extremely hazardous substances (EHS), (chemicals likely to cause harm to humans in the event of an accidental release), and of preparing local emergency response plans. The local plans are supposed to ensure that the community will be respond quickly and effectively in the event of a major chemical incident.

Every community in America is supposed to have such a plan in place; clearly such plans are most important to industrial communities or to communities which experience high volumes of chemical shipments within their vicinity. However, in examining the situation in some rail host communities, it became apparent that limits to disclosures are undermining effective preparation to cope with a rail-related chemical accident.

Union Pacific reports that it works with local emergency planning committees — e.g, conducting trainings for some local officials, and rail employees becoming members of some of LEPC's. However Local Emergency Planning officials we spoke with were uninformed as to the quantities of various hazardous materials carried by Union Pacific and Southern Pacific and thus unable to undertake an assessment of the vulnerabilities and risks posed.

Local emergency plans are supposed to identify the chemical accident scenarios that could happen in a community, and who would be impacted, and to detail a workable means of evacuating or sheltering people in the event of those incidents. LEPC's are voluntary bodies often disabled from effective emergency planning if it means making waves or raising concern among local citizens. Hobbled by local politics and a lack of funding for their work, LEPC's are often a paper tiger. LEPC's have taken strongest action in some communities where the hazards of local industries are apparent, and where local concerned citizens have pressed the LEPC into action.

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Reno, Nevada

Reno is located in Washoe County. The County’s Emergency Management Administrator, Press Clewe, informed us that the area’s emergency response program has been handicapped by the lack of disclosures by the railroad. There is no advance notification given to local government or the public when severely hazardous materials or even nuclear materials are being moved through the area. Emergency responses can be made more difficult by the fact that the railroad divides the northern and southern sections of the downtown area. A derailment or other incident could make the area impassable for emergency responders. He said emergency responders also lack sufficient equipment and effective plans needed to prevent the loss of lives or the contamination of water supplies in the event of a major hazardous materials incident.68

There has been some recent discussion about the potential for highly radioactive waste, including reactor waste from foreign countries, to be shipped via Union Pacific rail lines from California as early as 1998. While the state of Nevada has recommended against shipping high level nuclear materials through Reno,69 the Department of Energy plans to leave the decision to the carrier. There is no legal prohibition against shipments of nuclear fuels or even nuclear weapons through downtown Reno.70 Yet according to the City and state of Nevada there is not adequate training and equipment currently available in the area to respond to a nuclear rail incident. 71 The Governor of Nevada has suggested that the provision of such response capabilities should be an obligation and commitment of the US Department of Energy, and should precede any such shipments.72

Perhaps the biggest wild card in local rail transport dangers is the fact that Reno is located in an earthquake zone. The last major earthquake in Reno registered 6.4 on the Richter scale in 1914, but earthquakes over 6 are expected every ten years


71 Comments of City of Reno on Environmental Assessment, May 2, 1996.

72 Letter from Bob Miller, Governor of Nevada, to Federico Pena, Secretary of Energy, Concerning shipment of foreign nuclear fuels, April 14, 1997.
A large earthquake today could pose greater danger than those in the past, due, among other things, to the presence of more hazardous materials on the rail and in local industries.

Clewe said that the railroad has not provided his office with the kind of disclosure that would be needed to assess "vulnerability and risk. This would require information provision on an ongoing basis. We have gotten data once or twice regarding haz-mat shipments over a short period of time, but to say the data is spotty is an understatement. We know there is a hazard from haz-mat shipment but we are not able to conduct a risk assessment."

In the event of a serious chemical accident the 60,000 or so people typically situated in the downtown hotel and casino area could be at risk from toxic gas clouds or other hazards. Our examination of the local emergency plan for Washoe County found that the plan:

♦ does not identify what materials pass through downtown Reno, and therefore does not include adequate planning based on worst case scenarios for rail accidents;

♦ has not evaluated the equipment needs for an incident with the scaled up rail transport of chemicals and other hazardous materials anticipated by Union Pacific, and

♦ does not contain a state of the art approach to effective notification of hotels and residents of what to do in an accident. At one time Reno and Sparks (the adjacent town, where the UP railyard is located) had subscribed to a telephone notification system which would automatically call all local hotels and residences in the event of a chemical disaster, According to Clewe, this service was canceled by the cities. The service had cost about $24,000 per year. Instead, emergency notification in a rail chemical disaster would rely on door to door communications, television, word of mouth and public address systems. This unsystematic approach to notification could prove seriously flawed in a major chemical incident — unnecessarily endangering the lives of tourists as well as police and others charged with notifying people in the area.

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73 "Earthquakes in Nevada and how to survive them," Nevada Bureau of Mines and Geology.

Louisiana

Louisiana is located in the heart of the Gulf Coast chemical production region. Wilma Subra is the Local Emergency Planning Committee chair for Iberia Parish, located on the former Southern Pacific rail line (now part of Union Pacific). She said that train traffic in the area is frequent, and in her Parish the train tracks are at street level with houses on both sides of the tracks. To describe how frequent this train traffic is, she said that on a typical Sunday in church, over the course of an hour there will be three or four freight trains. As in Reno, in Iberia Parish the railroad bisects the town, creating a potential bar for emergency responders to reach people on the opposite side of an incident. Both of the hospitals are on the same side of the tracks.

Ms. Subra said that Southern Pacific railroad was asked repeatedly — orally and in writing — to provide a detailed list of chemicals, quantity and frequency shipped through Iberia Parish. Instead of the details requested, all the railroad provided was a one page summary of the general categories of chemicals shipped — with no quantities. Subra is also the former regional director of the Acadiana area emergency planning area — an eight Parish planning area for southwestern Louisiana. She said that this eight Parish group made the same request, but to her knowledge never even received the kind of one page summary received by Iberia Parish.

The Iberia Parish and Acadiana area attempted to work around the lack of information provided by the railroad. They have used a 10 mile worst case accident scenario as their emergency planning basis. However, Subra is not comfortable with the lack of information on which such local planning is based. “We give it our best guess. But we want to be prepared for each substance that is coming through. Without this information we are stuck.”

Livonia, Louisiana, located further east, has also been challenged to meet emergency planning needs created by the railroad. The Union Pacific’s Livonia railyard has been expanding recently. Emergency planning director Don Ewing told us that because Pointe Coupee Parish is such a low income area, it does not even have a siren system to serve the railyard neighborhood. Union Pacific representatives were asked about a year and a half ago whether UP would pay for such a system, but no formal response has yet been received. Ewing is still hopeful that the railroad will meet this need. Unlike Iberia and Acadiana dealing with Southern Pacific, Union Pacific has at least provided the Pointe Coupee emergency planning office with a list of chemicals shipped in Louisiana, though the list does not state the quantities shipped.

75 Personal Communication with Wilma Subra.

76 Personal Communication with Don Ewing.
Union Pacific Official Reports Openness to Some Public Information Requests

Lou Wagner, UP’s top chemical accident prevention official, told us that he is personally open to sharing information with local communities. “We are willing to share results of our safety work with local officials and local concerned citizens. For instance, we are willing to share the results of our inspections, and a one year printfout of commodities and volumes moving through an area or railyard. I wish more communities would ask for that data for emergency planning.” Thus there appears to be some potential for some community inquiries of Union Pacific to bear fruit in the future, especially where UP disclosure policies displace those of prior management at Southern Pacific. In contrast, Wagner noted that the railroad does not provide notice to local communities as to particular materials that will be shipped on a route in a coming week. On the other hand, said Wagner, “I can’t recall that we’ve ever been asked to do that.”

Joseph Wayne Griffin lives near the Union Pacific Livonia, Louisiana railyard. “As far as I know there are no emergency plans whatever. How would they let us know in an accident? We haven’t been contacted in any way about this. I don't know what we would do in the event of an accident. Would anyone call us? I am sure by the time they called we would be in the thick of a chemical cloud before they ever contacted us....Our grandchild goes to school a mile and half from the railyard. Would he be safe in an emergency?”

“Several months ago there was an incident just south of the site, in which there was a big fire that we could see from our house. It upset us because we didn’t know if it was on the railyard. It turns out it was a company that was nearby that was burning off butane or propane to relieve pressure. But it upset the hell out of us because we realized we wouldn’t have known if there was a chemical accident in the railyard.”


77 Personal Communication with Lou Wagner, General Director for Chemical Transportation Safety, Union Pacific Railroad, by Sanford Lewis.
Chapte* 5
OVERSIGHT OF THE MERGER BY THE SURFACE TRANSPORTATION BOARD

The merger of the Union Pacific and Southern Pacific railroads required the approval of a federal agency, the Surface Transportation Board (STB). The STB was established to assume some of the roles of the Interstate Commerce Commission when that agency was phased out by Congress in 1995.

When federal agencies propose a major federal action significantly affecting the human environment, they are required by the National Environmental Policy Act76 to prepare an Environmental Impact Statement (EIS) which assesses the environmental effects of the action and ways of mitigating these effects. The purpose of the EIS process is to ensure that decisions of agencies are well informed — that all significant environmental impacts of the activity have been assessed, that full consideration is given to potential mitigation, and that the public has had full opportunity to review and comment on a thorough environmental analysis.

The Surface Transportation Board decided, however, not to require an Environmental Impact Statement for the massive Union Pacific merger. It also apparently waived some important chemical disclosure requirements of its own regulations.

Now the city of Reno, NV is engaged in a pitched legal battle claiming a need for a more thorough environmental impact review and mitigation studies. The city filed lawsuits against the STB and Union Pacific in two federal courts, alleging that the government should have required a full EIS on the impacts of the merger.79 (See Chapter 3 for discussion of Reno’s concerns.)

Despite the environmental concerns of Reno, and similar concerns in other areas the rail line traverses such as Wichita, KS, the STB declined to prepare an EIS on the UP/SP merger. Instead the STB found that there would be “no significant impact on the environment” from the merger and therefore that no EIS would be required. In order to justify this decision the STB substituted a more superficial review, called an Environmental Assessment (EA), instead of an EIS. If an Environmental Impact Statement had been prepared, applicable regulations would have required the EIS to

78 42 USC 4332.

more thoroughly evaluate the options, including the alternative of foregoing the merger, and, most importantly, to thoroughly evaluate the mitigation alternatives to reduce environmental hazards from the UP/SP merger.80

While the EA developed in lieu of the EIS did not involve the kind of thorough assessment of the range of possible alternatives and mitigation measures for environmental harms, it did contain a few mitigation measures. With regard to transportation and safety the recommendations for mitigation were for UP/SP to:

- consult with Calcasieu Parish in Louisiana on safety issues to develop a mitigation plan and submit it to the STB;
- conduct rail capacity simulations for specific rail line segments in the Gulf Coast area, to ensure that safe train movements can be accomplished;
- conduct an assessment of whether there is a need to move toward higher tech "Automatic Block Signal" or "Centralized Traffic Control" systems on a Southern Pacific line segment between Houston and Arkansas;
- comply with the existing federal rules on hazardous materials transportation, and maintenance of rail line and grade crossing warning devices; and
- follow UP/SP emergency response plans.81

80 The relevant regulations require an EIS to sharply define the issues regarding alternatives, providing a clear basis for choice among options by the decisionmaker and the public. Specifically the discussion of alternatives would have been required to:
(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
(c) Include reasonable alternatives not within the jurisdiction of the lead agency.
(d) Include the alternative of no action [e.g. no merger].
(e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.
(f) Include appropriate mitigation measures not already included in the proposed action or alternatives. 40 CFR Sec. 1502.22.

Aside from the EA mitigation measures, the STB also agreed to conduct a separate study — after approval of the merger — to develop mitigation measures for Reno, NV and Wichita, KS. These mitigation plans are to be put in place prior to increasing rail traffic through those two cities. The STB will make its recommendations in September of this year.

Observers Claim STB Bias Against Public Interest

"It appears the deck is stacked here; that an outcome favorable to the railroad is already being fashioned. The deal is done, and we, the City of Reno, are parties to a charade."

Charles McNeely, Reno City Manager, after the STB canceled a series of problem-solving meetings with Reno Residents

The STB overrides strong antitrust objections raised by Department of Justice

At the time of the Board's creation (to replace some of the ICC's duties), it was noted by some observers that the STB was being structured so as to ensure that the UP/SP merger would succeed. In the event that Congress did not create the STB, the issue of the merger would have come under attack from the Department of Justice, whose antitrust chief Anne Bingaman was staunchly opposed to the merger and termed it "the most anticompetitive rail merger ever proposed." By creating the STB to rule on the merger, Congress ensured a more receptive forum for the merger issues to be resolved. In contrast to DOJ's position against the merger, when the issue came before the STB, Board chairman, Linda J. Morgan stated that rather than stopping the merger, "Government's role in today's world, in my view, should be to work more in partnership with industry to empower it to take the steps necessary to compete."

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82 Machalaba, op cit.


84 Quoted in Don Phillips, "Board Approves Big Western Railroad Merger", The Washington Post, July 04, 1996, p. D08. For more on the historical process of the merger, see International Brotherhood of Teamsters, "How Bob Dole Defied Midwestern Farmers and Helped
STB Fails to Enforce Chemical “Right to Know” Rules for America’s Biggest Haz-Mat Carrier

Morgan and her STB associates have seemed intent on granting the merger with little or no critical consideration of many environmental or community concerns. For instance, despite the potential doubling of rail traffic through communities such as Reno, and likely increases of chemical traffic as a result of the merger, the STB did not strictly enforce its own regulations regarding disclosure of hazardous materials shipments. The STB rules (inherited from the ICC) require that an applicant for a merger submit an Environmental Report, which provides the baseline information for an EA or EIS. This report includes a requirement:

Union Pacific declined to project its increases in hazardous materials shipping in its merger application, despite an STB rule that requires this information. The STB allowed this omission to pass without challenge.

(ii) If hazardous materials are expected to be transported, identify: the materials and quantity; the frequency of service; whether chemicals are being transported that, if mixed, could react to form more hazardous compounds; safety practices (including any speed restrictions); the applicant’s safety record (to the extent available) on derailments, accidents and hazardous spills; the contingency plans to deal with accidental spills; and the likelihood of an accidental release of hazardous materials.85

One would expect this rule would apply to Union Pacific, the nation’s largest chemical hauler. The affected public had a Right to Know, through this rule, the types of materials which would be increasingly shipped on the rails, for instance. But rather than respect that Right to Know, the UP application merely stated with regard to disclosure of materials types that the:

“proposed merger is not expected to affect the policies or operation of UP/SP concerning the type or quantity of hazardous materials transported or the method of handling. Therefore, the types and quantities of hazardous commodities do not appear to be a factor in evaluating the safety impacts of the

85 49 CFR 1105.7(7)(ii).
merger."\(^86\)

While the railroad’s “policies or operation” concerning the “type or quantity of hazardous materials” might not change, the volumes of such materials flowing through some areas is surely destined to increase. For instance, freight traffic through Reno is expected to nearly double.\(^87\) The merging of the railroads does not merely mean the merging of their previous freight volumes, but also opens opportunities to serve customers who previously had to rely on trucking as the only way to move their goods from origin to destination. The railroad itself expects an increase of more than 6 million miles of train travel per year as a result of drawing traffic from other sources.\(^88\) Yet they omitted in their application to quantify or project the portion of this increased traffic that will be chemical shipments.

UP also notes briefly that it has emergency response and emergency action plans — e.g., identifying who to call in emergencies, and how the railroad or its agents will respond “immediately” in the event of incidents.

A total of 420,000 and 305,000 hazardous materials shipments were transported by UP and SP respectively in 1994. These shipments resulted in 118 reportable incidents for UP and 35 incidents for SP. Therefore 99.98% of the shipments arrived at their destination without incident. ...the consolidation of the companies will result in a “best practice” approach to hazardous material handling and emergency action planning.\(^89\)

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\(^86\) Union Pacific, Environmental Report. STB regulations provide that the agency can waive the disclosure requirement.

\(^87\) Section on Environmental Analysis of the STB, document presented to Mitigation Task Force, shows “through freight trains” as 12.7 per day pre-merger and 24.0 post-merger.

\(^88\) In the Environmental Report accompanying its application the railroad reports that it expects “a system wide increase in train miles traveled of 6,204,270 per year. All of this traffic will be diverted from other rail carriers or from trucks.” Union Pacific, Environmental Report, p. 53.

\(^89\) Excerpts from Union Pacific Environmental Report submitted with merger application. The excerpt was provided by City of Reno consultant Mark Demuth, who stated that examination of the table of contents of the Environmental Report indicate that this section appears to be the only reference to hazardous materials. Memo from Mark Demuth, MADCON Consultation Services, to Sanford Lewis, July 17, 1997.
5. Oversight of the Merger by the STB

No EIS -- No Worst Case Analysis

With the merger, rail shipments will be able to reach many areas that were not previously reachable by rail. In its application, Union Pacific asserts that as it diverts some traffic from trucking to the rails, it will likely yield a net improvement of safety.\(^{90}\)

Safety is best considered, however, as a factor of both incidents per mile traveled and severity of potential accidents. While the record of trucking may be worse on total incidents per mile traveled, a derailment of numerous chemical or radioactive tankers together — as can only happen on rail — can result in a larger, more devastating accidental release of hazardous materials than an incident involving a single tanker truck. One analysis which could have been conducted in the EIS would be the probability and impact of a large accident as a result of the increased rail shipment of hazardous materials. An effective analysis would indicate the increased number of reasonably foreseeable serious chemical accidents and nuclear accidents that might occur, and the worst of those accidents. Federal regulations governing Environmental Impact Statements define 'reasonably foreseeable' to include impacts which:

have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.\(^{91}\)

As shown in Chapter 2 of this report, given the right information about materials flows, it is possible to develop such an analysis of worst case scenarios for rail chemical and nuclear shipments. It is also possible to develop projections of the increased probability of such incidents due to the increased shipment of such materials via rail.

If it had performed such an analysis, the STB could have ensured that before the railroad increased its haz mat shipments further, there would be thorough EIS review of options to step up safety.

Did the STB Place Too Much Reliance on UP’s “Best Practices” Assurances?

Perhaps it was because of UP’s reference to going toward a “best practice” approach — adopting the more stringent safety practices of either of the merged

\(^{90}\) "The diversion of long-haul truck traffic should have a very significant beneficial effect on safety, and should result in the merger having a net beneficial effect on safety.” Union Pacific Environmental Report on Merger, p. 53.

\(^{91}\) 40 CFR 1502.22.
railroads — that the STB chose to minimize its focus on the hazardous materials shipments likely to increase through many areas as a result of the merger. But as shown throughout this report, our research provides ample evidence to suggest that the railroad may have far to go to achieve “best practices,” from a practical standpoint, when it comes to safety and rail shipments of chemicals. For instance:

- Train crews say they need more training to respond to and prevent chemical incidents;
- Train personnel report exhaustion due to understaffing of trains;
- Safer technologies are reported to be available to prevent train crashes, especially in dark areas, through proximity detection equipment (positive train separation);
- The two host areas whose emergency planning we reviewed seemed ill-prepared for potential worst case accidents; if these are representative, then wide-ranging improvement in local emergency preparedness would be needed.

92 Surface Transportation Board, Section on Environmental Analysis, Environmental Assessment, Volume 2, April 12, 1996 adopts almost verbatim the information reported by Union Pacific in its environmental report. See text above. The Environmental Assessment states that “A total of 420,000 and 305,000 hazardous materials shipments were transported by UP and SP, respectively, in 1994. These shipments resulted in 118 reportable incidents for UP and 35 incidents for SP. Therefore 99.98% of the shipments arrived at their destination without incident. The applicants have noted that the consolidation of the companies will result in a “best practice” approach to hazardous commodity handling. SEA concludes that, using the same rate of safe transport, the projected increases in accidents and shipments of hazardous materials as a result of the proposed merger do not constitute a significant safety risk.” at EA, 9-12.
The company has room to improve its disclosure policies to consistently respect the public’s needs and rights to know about hazardous materials transported on the rail lines.

Given the opportunities for additional work by Union Pacific to achieve "best practices", we believe a full Environmental Impact Statement, and mitigation plan detailing how the railroad will achieve such "best practices", would be in order.

STB Cancels Public Forums in Reno

An advisory group to the Board had been meeting locally in Reno to oversee the mitigation study and provide input on the wide range of impacts that necessitate mitigation. As if to confirm the public’s fears of bias, in July the Board stunned Reno officials and residents by canceling the three remaining summer meetings regarding the mitigation process, despite the failure of the process to obtain input on many of the issues of concern to the city. The Board did not even send an STB staffer to courteously deliver the news of cancellation in the July meeting. Instead, STB consultants Dave Mansen and Kay Wilson were\(^{93}\) left delivering the bad news that prior to issuing draft recommendations in September no more face to face input would be sought from the city and its residents on the huge number of issues remaining unaddressed. The concerns expressed by the city included pedestrian safety, emergency vehicle access, derailments and spills, Native American issues, biological issues, property rights, noise, air quality, hazardous materials, and city buses.

Said Charles McNeely, Reno city manager, "It appears the deck is stacked here; that an outcome favorable to the railroad is already being fashioned. The deal is done, and we, the City of Reno, are parties to a charade.\(^{94}\) The city attorney and consultant reportedly slammed down on the table a half-inch stack of unanswered city letters to the STB.

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\(^{93}\) The consultants were Dave Mansen from the consulting firm of DeLeuw, Cather & Co. and Kay Wilson from Public Affairs Management. Personal Communication with Mark Demuth, Principal, MADCON Consultation Services, by Sanford Lewis, July 17, 1997.

Chapter 6
CONCLUSIONS AND RECOMMENDATIONS

The recent record of the railroads and Union Pacific in controlling the growth of chemical accidents during expansion of chemical shipments has been favorable. Union Pacific in particular prescribes to an admirable and appropriate commitment toward achieving “incident-free” transportation. However, our research demonstrates that the railroads, including Union Pacific, have a long way to go to become good neighbors and safe employers.

With the growth in hazardous material shipment via rail comes added risks of worst-case accidents in host communities. While safety designs are proving able to keep the number of derailment-related releases from increasing, the higher the volume of chemical shipments, the greater the chance of severe or worst-case incidents on the rails.

The rail carriers therefore face two types of challenges — first to continue the trend toward preventing releases in accident and nonaccident incidents, and secondly, working to head off worst-case scenarios with added safeguards and emergency preparedness.

Union Pacific, in particular, faces new challenges as a result of the rapid growth of both the railroad and its hazardous materials business. As it brings together the employees, cultures and operations of two large railroads, the company’s commitment to using the “best practices” of either of the two rail lines may yield a few improvements. However, our research raises doubts as to whether either UP or SP are yet engaging in “best practices achievable” from the standpoint of ensuring safest technologies, human resources (staffing policies), emergency preparedness and public accountability.

The recent toll in death, disruption and near disasters seems too high a price to pay to allow the railroads’ internal learning processes to proceed without greater external intervention. Community, workforce and governmental oversight is appropriate to ensure that safety on the rails will keep pace with and surpass the growth of chemical rail transportation.

The federal government has a crucial role to play in enhancing safety on the interstate rail carriers. It appears that competitive pressures among the railroads may be deterring the prompt adoption of safer technologies and work practices by any one carrier. For instance, requiring proximity warning devices, which might have prevented some recent fatal accidents, is one way federal regulatory officials could intervene. In order to create a level economic playing field the FRA could require all carriers to adopt these safer technologies or their equivalent. Requiring positive train separation technologies was recommended to the Federal Railroad Administration by the National Transportation Safety Board more than ten years ago, yet the FRA has so far failed to require it.\(^\text{96}\) The FRA has been working with Union Pacific and Burlington Northern railroads on a pilot project in the Northwest regarding positive train separation, but has no timelines established for widespread adoption of this needed technology.

As shown in chapter 5, another federal agency, the Surface Transportation Board demonstrated a surprising lack of attentiveness to public interest concerns raised during the rail merger.

Given such inaction of federal agencies, state and local government as well as impacted workers and citizens need to act where they can to bring about safer rail freight shipping. One potential approach that we favor is to establish more effective oversight by the workforce and host communities. Previous experience with Right to Know laws in fixed industrial facility settings demonstrates that a public and workforce Right to Know, along with effective programs of training and empowerment, can be a strong tool for accelerating change toward advanced environmental safety goals.

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**WHAT LOCAL COMMUNITIES AND CONCERNED CITIZENS CAN DO**

If you are concerned about the chemical accident hazards posed by Union Pacific or other railroad, here are some things you can do in your own community:

**Insist on disclosure of data that the railroad has generated or has in its files regarding chemical accident hazards.**

Accountability begins with a better understanding of the hazards presented by your local freight rail lines. Effective nongovernmental community organizations may directly pressure railroads for disclosure of the needed information. In addition, Local

\(^{96}\) BLE Press Release, June 26, 1997, notes that the technology was first recommended to the FRA by the NTSB in 1986.
Emergency Planning Committees have the seldom-invoked authority to force disclosure of this data under section 303 (d)(3) of the Emergency Planning and Community Right to Know Act, since this data is needed for purposes of emergency planning.97 Local emergency planners should request sufficient information from the railroads to generate worst-case rail accident scenarios, and to prepare effective response plans preparing for such events.

From our review of Union Pacific, we identified the following types of documentation which the carrier has most likely generated and could be pressed to make available to concerned citizens, workers and officials:

--a printout of the chemicals (and volumes) flowing through each railyard or rail line of concern during the previous year;
--five years of inspection reports from within a region or local railyard
--a list of all accidents, leaks and near misses within a region or railyard;
--safety and environmental audits.98

Establish legally binding commitments for the railroads to be Good Neighbors.

Legal conditions on a railroad's local behavior can be imposed either through state or local ordinance or regulation, or through direct negotiations of a "Good Neighbor Agreement." Federal, state and local governments all have authority to impose many of the conditions needed to better control chemical transportation safety and preparedness.

An alternative approach to imposing statutory or regulatory conditions on corporations is to negotiate directly with them for a Good Neighbor Agreement — a

97Section 303 (d)(3) gives the LEPC the authority to request “all information needed” for emergency planning. So arguably, despite the exemption from annual inventory reporting under section 312 of EPCRA, the LEPC’s have the authority needed to request all of the data that UP has generated -- data that is needed to assess the potential for an accident, e.g. which type of chemicals are most likely to be released, from which locations, worst case conditions to anticipate, etc. Given Union Pacific’s reticence to engage in disclosures, the LEPC may need to be prepared to sue Union Pacific for disclosure of this necessary data.

98 Disclosure of other relevant data in Union Pacific’s possession can also be pursued. For instance, Union Pacific may have access to or copies of a study conducted by Allied-Signal regarding the transport of their product, hydrogen fluoride, on rail lines originating in Geismar, Louisiana. This study, done in 1989, identifies the extent of risks or transport posed to neighboring communities. Allied Signal, Inc. Risk Assessment of Hydrogen Fluoride Transportation Routes (Route Originating at Geismar, LA), Morristown, NJ May 23, 1989. Prepared by ICF Technology, Inc., Fairfax. VA. Cited in USEPA, Hydrogen Fluoride Study, Report to Congress, 1993, p. 98.
6. Conclusions and Recommendations

...binding oversight and problem-solving framework for ensuring that the firm is doing all it can to address community and workforce concerns.

Some of the issues identified in this report demonstrate a commonality between community and rail workforce concerns. If workers on the rails are exhausted and undertrained, both the community and the workforce may be endangered by rail accidents. If the Right to Know regarding chemicals being shipped is not provided, "what we don’t know" can be a source of harm to both rail workers and the rail host communities.

Many community coalitions of neighbors and workers have negotiated Good Neighbor Agreements with large and small industries to address the array of concerns of their coalition members. These agreements have been particularly innovative in the crafting of oversight mechanisms through which local residents have been able to bring the expertise of independent experts to bear on direct assessment of local hazard conditions and opportunities for pollution prevention. Some of these agreements have also been notable in their inclusion of sustainable development conditions, bridging environmental and economic concerns.99

Some of the issues identified in this report that need the most work, and which can be addressed through government regulations, legislation or a Good Neighbor Agreement include:

♦ relocating toxic transport rail lines away from the most populous areas;
♦ providing one week's advance notice of shipment of the most highly radioactive nuclear, explosive or toxic materials through the community;
♦ shipment of dangerous materials ONLY in dedicated, rigorously supervised and inspected trains, rather than in mixed shipments;
♦ regular commitments to disclosure of audits, inspections, etc. to the public and to local government;

99 For instance, residents of Rodeo, California negotiated a Good Neighbor Agreement with a Unocal refinery for extensive review of the safety of the facility, accompanied by independent experts paid for by the company. Residents of Manchester, Texas negotiated an agreement with the Rhone Poulenc chemical company requiring the company to allow a broad environmental and safety audit by an expert overseen by local citizens, and sweeping disclosure of numerous documents to be placed in a depository in the local library. See publications list at back of this document, and our website at http://www.envirolink.org/orgs/gnp for several Good Neighbor Project publications providing more details on precedents and strategies for reaching Good Neighbor Agreements. Contact the Good Neighbor Project for additional information or strategic advice on negotiation of Good Neighbor Agreements.
Hazardous Materials on the Rails

- signaling systems and grade crossing signals at all points where chemical cars may cross;

- subscribing to emergency notification community alert automated phone bank systems for quicker, more reliable notice to all households and businesses in the event of an incident.\(^\text{100}\)

**What the Federal Government Can Do**

**Reorient the Surface Transportation Board to Protect the Public, Not just the Railroads.**

President Clinton must soon fill the current vacancy on the Surface Transportation Board. He should fill this slot with an appointee with a proven record and commitment to addressing public safety, and sensitivity to community, labor and environmental concerns.

As detailed in this report, one immediate issue facing the STB is whether it will reduce the impacts of the UP/SP merger on Reno, NV and Wichita, KS prior to authorizing additional rail traffic on routes passing through those cities. An additional pending eastern US proposal of CSX Corp and Norfolk Southern Corp to buy Conrail Inc. also raises environmental and community concerns.

The current Board appears biased against responsiveness to local communities and public concerns, having already in the UP/SP merger:

- failed to require UP to file the hazardous materials shipping Right to Know disclosures generally required by merger regulations;

- failed to prepare an Environmental Impact Statement despite the merger's significant environmental impacts on host communities like Reno; and

- abruptly shut down its community mitigation meetings this summer in Reno after two Union Pacific train crashes demonstrated the realism of concerns raised by Reno residents.

In addition to exercising care in the selection of a new STB member, consideration should be given to removal of the chairman of the STB, as well. Removal is provided by law for "inefficiency, neglect of duty or malfeasance." In the UP/SP merger, Chairman Morgan's failure to insist upon an EIS that evaluated the safety and environmental impacts of increased chemical shipping amounted to a neglect of duty.

\(^{100}\)For additional information on one telephone community alert system, contact the Community Alert Network, 800 992-2331  http://www.can-intl.com.
We recommend that the STB should not grant UP its request to expand rail transport of hazardous materials through Wichita and Reno until the following are done:

- A full Environmental Impact Statement is prepared detailing worst case scenarios, materials carried on different rail segments, and complete review of mitigation options — e.g., rerouting some highly urbanized corridors and requiring exclusive use of slower speed, well staffed and heavily monitored dedicated chemical trains.

- Conditions are imposed achieving "best practices" for rail safety and hazardous materials shipping, based on investigation and intervention on the issues of safety and accountability identified by this report.

The Federal Railroad Administration should require proximity warning devices or their equivalent in all "dark" rail lines.

The Federal Railroad Administration should move more aggressively, with a directive or regulation setting a timetable for all rail carriers with unsignaled territory to institute positive train separation technologies (proximity warning devices) or other technologies that can be proven to be equivalently effective. Earliest attention should be given to instituting this change at the railroads with most shipments of hazardous materials, such as portions of the Union Pacific Railroad.

Federal Review of Rail Staffing Issues

The Federal Railroad Administration and National Transportation Safety Board should investigate the adequacy of railroad staffing levels, qualifications and training, including both dispatching and on-train personnel. Priority should be given to railroads with most shipment of hazardous materials such as the Union Pacific Railroad.

# # #
Good Neighbor Project Publications


Precedents for Corporate-Community Compacts and Good Neighbor Agreements, 17 pgs, $3.


Stakeholder Audit Guidelines, 4 pgs, $1.

Enforcement of Good Neighbor Agreements, $1 Fact Sheet.

Model Good Neighbor Agreement, 20 pgs, $5.

Unocal Good Neighbor Agreement, 30 pgs, $5.

Rhone-Poulenc (Texas) Good Neighbor Agreement, 10 pgs, $5.

Alcoa Aluminum Zero Discharge Agreement, 2 pgs, $1.


Full Disclosure: The Newsletter of the Network Against Corporate Secrecy - Network membership required - Send inquiry letter for membership/subscription.


Enforcement and Chemical Accident Prevention, 10 pgs, $5.

Chemical Accidents: What Communities Can Do To Prevent the “Worst Case”, Free Fact Sheet

Community Safety Inspection and Audit Programs and Policies (Reprint: New Solutions) 15 pgs, $3.

Chlorine Phaseouts and Job Displacement, 15 pgs, $3.


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Technical Advisor — Our experienced R&D Chemist aids in evaluating options for reducing the use and storage of toxic chemicals at local plants.

Please give us a call for any inquiries and an initial consultation.

The Good Neighbor Project for Sustainable Industries is a project of the nonprofit Tides Center.