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Decision 92-07-002 July 1, 1992

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Investigation on the Commission's own motion into identification and mitigation of local safety hazards on California's railroads.	I.92-03-017 (Filed March 11, 1992)

Jeff S. Asay, Attorney at Law, for Union Pacific Railroad Company; Carol A. Harris, for Southern Pacific Transportation Company; and Donald J. Reisner, Attorney at Law, for the Atchison, Topeka and Santa Fe Railway Company; respondents.
James P. Jones and Mike Anderson, for United Transportation Union, and Paul E. Morrison, for Brotherhood of Locomotive Engineers, interested parties.
James T. Quinn, Attorney at Law, Paul King, and Vahak Petrossian, for the Safety Division.

I N D E X

INTERIM OPINION - PHASE I

I. Background

In 1991 the Legislature mandated a new system of annual review of California's railroads for the purpose of identifying local safety hazards and adopting appropriate measures to mitigate these hazards. Two different bills were enacted, both setting standards and requirements, some of which overlap, for the identification of railroad hazards in the state.

Senate Bill (SB) 48 added §§ 7711 and 7712 to the Public Utilities Code (PU Code), which require this Commission to report to the Legislature by July 1, 1992, and each July 1 thereafter on railroad sites in California we find to be hazardous.[1] The

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1 The full text of PU Code § 7711 provides:

"On or before July 1, 1992, and on or before July 1 annually thereafter, the commission shall report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The report shall include, but not be limited to, information on all of the following:

"(a) A list, prepared pursuant to Section 59019 of the Health and Safety Code, of all commodities transported on railroad lines in the state that could pose a hazard to the public or the environment in the event of a train derailment or other accident.

"(b) A description of the quantities of commodities identified in subdivision (a) that are transported on railroad lines in the state. The commission shall also describe the locations and routes at, and on, which the commodities specified in subdivision (a) are transported. Railroad

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corporations shall provide to the commission all information necessary to comply with this subdivision.

"(c) A list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years. The list shall describe the nature and probable causes of the accidents, if known.

"(d) A list of all railroad sites in the state that the commission determines pose a local safety hazard. Factors that the commission shall consider in determining a local safety hazard may include, but need not be limited to, all of the following:

"(1) The severity of grade and curve of track.

"(2) The value of special skills of train operators in negotiating the particular segment of railroad line.

"(3) The value of special railroad equipment in negotiating the particular segment of railroad line.

"(4) The types of commodities transported on or near the particular segment of railroad line.

"(5) The hazard posed by the release of the commodity into the environment.

"(6) The value of special railroad equipment in the process of safely loading, transporting, storing, or unloading potentially hazardous commodities.

"(7) The proximity of railroad activity to human activity or sensitive environmental areas.

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report must include: (1) a list of all commodities transported on California railroads that could pose a hazard to the public or environment in the event of an accident; (2) a description of the transport of these potentially hazardous commodities by quantity, locations, and routes; (3) a list of all derailment accident sites in California in the last five years and the causes of these accidents; and (4) a list of all railroad sites that the Commission finds pose a local safety hazard, using at least seven specified criteria and the history of accidents at or near the sites.

Section 7712 requires the adoption of regulations based on these findings by January 1, 1993.

Assembly Bill (AB) 151 added § 765.5 to the PU Code, which requires this Commission to identify track sections that we find pose local safety hazards and report to the Legislature by July 1, 1992.[2] This report must include all sites which are

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> "(e) In determining which railroad sites pose a local safety hazard pursuant to subdivision (d), the commission shall consider the history of accidents at or near the sites. The commission shall not limit its determination to sites at which accidents have already occurred, but shall identify potentially hazardous sites based on the criteria enumerated in subdivision (d) and all other criteria that the commission determines influence railroad safety."

2 In pertinent part, PU Code § 765.5 provides:

> "(a) The purpose of this section is to provide that the commission takes all appropriate action necessary to ensure the safe operation of railroads in this state.

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determined to have inordinately high derailment rates. AB 151 further requires that the Commission propose regulations by December 31, 1992 to establish a program to eliminate or reduce the identified local safety hazards. The regulations must include requirements regarding special equipment and operating, inspection, and reporting standards, as well as capital improvements.

The statutory requirements of fact finding and resolving lead naturally into a two-stage process. The first stage is the identification of hazards, with which we are dealing in this interim opinion. The largest task in this first stage is the identification of local safety hazards throughout the California railroad system. The second task is the identification of potentially hazardous materials, to be enumerated by the Office of Environmental Health Hazard Assessment, being transported by rail in the state. We cannot meet the July 1 deadline in completing

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> "(b) Not later than July 1, 1992, and annually thereafter, the commission, consistent with Section 434 of Chapter 13 of Title 45 of the United States Code, shall identify track sections which it determines pose local safety hazards, and report on those sites to the Legislature. The commission shall include in its report at least all those sites which have inordinately high derailment rates, as determined by the commission.
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> "(c) Not later than December 31, 1992, the commission shall propose regulations it determines would establish a program to eliminate or reduce the local safety hazards identified in the report prepared pursuant to subdivision (b). The regulations shall include requirements relating to special equipment; operating, inspection, and reporting standards; and recommended capital improvements at each site."

this portion of the review, because the list of hazardous materials is currently under development and is not due out until July 1, 1992. We have, however, identified the known hazardous materials currently being transported by the railroads in California and set them forth below.

The second stage of this process will be the identification and adoption of appropriate measures to mitigate or eliminate the identified hazards. This will occur pursuant to procedures to be adopted within the next 60 days in Phase II of this investigation.

There are 39 railroads in California, four of them larger, Class 1 railroads and 35 shortline, Class 2 and 3 railroads. In total there are approximately 12,000 miles of railroad track under this Commission's jurisdiction. It is unrealistic to suppose that all of this track can be completely analyzed for hazards by July of this year, yet identification of the worst hazards should be achievable. For 1992 our first priority is the examination of potential hazards on all of the Class 1 railroads and on any shortline railroads that carry hazardous materials.

Our order in Investigation (I.) 92-03-017 directed the railroads to provide information regarding their operations in the areas of derailment and other accident frequency, hazardous materials transportation, and other local safety hazard information. The railroads complied to the extent that they had the information.

The Safety Division of the Commission analyzed the submissions of the railroads, did its own preliminary investigative work, included other pertinent material, and issued its "Report on Local Safety Hazards on Railroads in California" (the Report). At a prehearing conference held May 20, the Report was marked as Exhibit 1. For the purpose of this Phase I and Interim Opinion, we adopt the Safety Division report in its entirety.

We must emphasize that the listing of a track segment as a local safety hazard does not mean, and should not be taken to mean, that the track segment is hazardous under current railroad operating restrictions. Whether mitigation measures in place have eliminated the hazard will be reviewed in Phase II of this investigation.

II. The Safety Division Report

The primary respondents to this Order Instituting Investigation (OII) are the Class 1 railroad corporations which own most of the track in California: Southern Pacific Transportation Company (SP), Union Pacific Railroad Company (UP), the Atchison, Topeka and Santa Fe Railway Company (ATSF), and Burlington Northern Railroad (BN). (BN reports that it has no employees, and only 60 miles of track, in California.) These railroads, as well as the shortline railroad corporations, were required to provide information regarding their accident frequency and hazardous materials transportation.

The following shortline railroad corporations have reported carrying hazardous materials:

Central California Traction Company
Harbor Belt Line
Los Angeles Junction Railway Company
Oakland Terminal Railway
Parr Terminal Railroad
San Diego and Imperial Valley
Santa Maria Valley Railroad
Ventura County Railway
Yreka Western Railroad.

The Report recommends that the following railroads be included in this initial phase because it is not clear whether they transport hazardous materials:

Port of Oakland Railway
Sacrament-Yolo Port District
San Francisco Belt Railroad
Trona Railway Company

Stockton Public Belt Railroad
North Coast Railroad (former Eureka Southern Railroad)

Because of time constraints imposed by SB 48 and AB 151, the Report has been limited to identification of areas with timetable operating restrictions and areas with the highest derailment incidence. This initial analysis and recommendation was limited to derailments occurring on main and siding trackage. This category of accidents was responsible for 60% of the damage to railroad track and equipment and, when hazardous materials were released, at least 62% of those accidents resulted in the public being evacuated. (Between 1976 and 1991 there were 13 accidents with the release or threatened release of hazardous materials; 8 caused evacuation.) Additionally, main and siding track accidents, on the average, tended to be more severe, with approximately three times the damage to track and equipment compared to the remaining categories.

Several track segments were identified on the three major railroads, SP, UP, and ATSF. One segment was identified on trackage formerly operated by the SP (NWP) and the Eureka Southern, and as of April 1, 1992, currently operated by the North Coast Railroad Authority. A total of 38 track segments were tentatively identified as local safety hazards pending further review in Phase II. Twenty-two track segments were identified through statistical analysis of the derailment history from 1976 through 1991. Sixteen track segments were identified by operational analysis, based on whether the carriers impose operating timetable restrictions on train movements in mountain grade areas. For the segments identified by these two methods, further analysis will be needed to determine the nature and magnitude of the hazard at these sites and what, if any, mitigation measures are needed.

Table 1 provides a summary of Federal Railroad Administration (FRA) reportable derailments on main and siding

trackage in the state for the period from 1976 to 1991. Also listed in the table is information on hazardous materials involvement in those accidents.

Table 1

Derailments on Main Lines and Sidings 1976-1991
For FRA Reportable Accidents

Railroad Corporation	Number of Accid.	Accid. with Hazmats in Train	Accid. with Damage to Hazmat Cars	Accid. with Hazmat Release	Accid. with Evac.
Alameda Belt Line	1				
Atchison, Topeka & Santa Fe	236	26	13	3	
Burlington Northern	4				
Central California Traction	2				
California Western RR	1				
Eureka Southern	23*	1	1		
Los Angeles Junction	1				
McCloud River RR	4				
Northwestern Pacific	23*	1	1		
San Diego, Arizona & East	4	1	1		
Sierra RR	5	1	1		
San Francisco Belt RR	1				
Santa Maria Valley RR	2				
Southern Pacific	955	110	55	7	8
Trona Railway	8				
Union Pacific	139	15	11	3	
Ventura County Railway	1				
Western Pacific	120	22	8	—	—
Total	1,530	177	91	13	8

*Approximately 15 of the accidents tallied under the NWP occurred on the portion of the NWP that became the Eureka Southern before Eureka Southern became the owner of that portion.

The Safety Division employed two methods to determine sites as local safety hazards: a statistical analysis of the accident history and a review of the railroad's site-specific operational characteristics. The Report describes its methodology.

A. Accident Statistics

Accident statistics were used to identify segments of track to be considered local safety hazards. Due to the time constraints of the project this year, the analysis was limited to derailments on main and siding tracks, as these accidents tend to be the most severe and raise the greatest public concern. Track segments with a statistically significant high derailment frequency were identified. The accident history analysis also assisted the Safety Division in its operational observations. Sites with historically high, and statistically significant, derailment rates were given added attention during the on-site observations. A more detailed description of the statistical methodology used is found in Appendix A of the Report. Figures showing the derailment incidence for track segments are in Appendix B of the Report.

The Report states that several statistical issues need to be further examined during the course of this project. Concerns include:

Data Base Completeness

There are several notable gaps in the data base which raise the question of the completeness of the reporting. The data base showed no accidents for about two years in one of the areas of highest incidence in the state. This same area showed 14 and 12 accidents for the two-year periods immediately before and after the period in question, respectively. Other apparent gaps need to be examined in detail as well. It is important to note that the U.S.

General Accounting Office[3] was very critical of the completeness and accuracy of the accident reporting to the FRA during this period.

Statistical and Data Entry Concerns

Some of the findings, or lack of findings, could be due to the quality of the reports sent to the FRA and to data entry errors. Several corrections to county location codes, milepost designations, and other missing data were made. One analysis, for one-mile segments of track was not performed due to the observation that the milepost designation of the nearest station was probably entered rather than the actual derailment location by milepost. This would serve to artificially raise the frequency and statistical significance of specific one-mile segments.

B. Operational Review Method and Site Identification

The Safety Division's observation of a carrier's operational characteristics consisted of the following procedures:

Arrangements with the carrier to ride a train over a particular segment of track for observation,

Riding the train over the segment with a carrier representative,

Review of pertinent track charts,

Review of carrier's timetables,

Review of reportable derailment statistics over relevant sections of track, and

Observations of the train's operation and surrounding environment.

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3 United States General Accounting Office, 1989, (GAO/RCED-89-109), Railroad safety: FRA needs to correct deficiencies in reporting injuries and accidents. Washington, D.C.:GAO.

Time constraints of this investigation have relegated the Safety Division to limit and prioritize the initial prospective sites for review to those located in mountain grade territory. Additionally, with the exception of the UP Feather River segment, the chosen inspection sites have been identified by the carriers as grade restricted; that is, they have been specifically noted in the respective carrier's timetable with special restricting operating rules governing all movements.

There are inherent train operating dangers (hazards) present in mountain grade and curved territories. This has been recognized by the carriers by the additional stringent operating rules in effect within mountain grade regions. These supplemental and strict rules were imposed for a number of reasons (some subsequent to uncontrolled train movements - runaways). For example, such grades are a major factor when considering stopping distance, and track/train dynamic forces become more critical during operations within grade and curve territory.

Each carrier has timetable special requirements and rules governing train operations which are unique to specific mountain grade territories. The following rules were excerpted from Southern Pacific's "Rules and Instructions Governing Air Brake System Train Handling." These rules, specifically Rule 964, indicate the type of restriction and caution required over this type of topography:

With respect to train speeds:

1. "... The downhill push of the train due to gravity is always acting to increase speed; braking effort must act to overcome this force."

2. "Speed is a key factor since the braking horsepower required to control the train increases directly with the speed and weight of the train. ..."

3. "Improper judgment in braking may permit the speed to get out of control in a very short time. ..."

With respect to braking:

"The following automatic brake pipe reductions must not be exceeded to control the train at the following speeds:

"Maximum Brake Pipe Reductions	Maximum Speed Allowed
13 psi	Above 25 MPH
18 psi	25 MPH or less

"If the above brake pipe reductions are exceeded, the brake horsepower becomes excessive creating unacceptable wheel heat. When this occurs on long grades both brake shoes and wheels will lose the ability to retard them."

Rule 966 provides the following caution with respect to curvature considerations:

"Special care must be observed in negotiating curves in excess of two degrees, especially curves of four degrees or more in order to avoid generating excessive lateral forces as these excessive forces can cause wheel climb or rail turnover. The lateral forces which can cause this situation come from the dynamic forces produced by run-ins of slack; by having long cars coupled to short cars under certain conditions; by having long, light cars preceding blocks of heavily loaded cars; by having slack run-in against the locomotive; by coupler or truck characteristics; or by high steady state buff or draft forces."

C. Recommendation for Phase I

The Safety Division recommends that the lists shown on Tables 2 and 3 serve as the Phase I list of safety hazards. Two lists are presented - one for the statistical analysis method and one for the operational review method.

The track segments listed in Table 2 were identified by the statistical analysis method. A more detailed description of the method is included in Appendix A of the Report. Figures showing the location of accidents on each line are included as Appendix B of the Report.

The track segments listed in Table 3 were identified by the operational review method. A more detailed description of each track segment can be found in Appendix C of the Report.

Table 2

Carrier	Line Description	Segment of Track	Appendix B Figure Reference
1. ATSF	Cajon *	MP 58 - 68	Fig. 4, 5
2. ATSF	Cajon *	MP 81 - 81.5	" 4, 5
3. UP	Canyon *	MP 233 - 243	" 6, 7
4. UP	Canyon *	MP 253 - 263	" 6, 7
5. UP	Canyon *	MP 273 - 283	" 6, 7
6. SP	Coast *	MP 239 - 249	" 10, 11
7. SP	Donner *	MP 150 - 160	" 14 - 19
8. ESRR	Willits - Eureka	MP 190 - 210	" 20, 21
9. SP	Fresno Line	MP 201 - 211	" 21a, 21b
10. SP	Fresno Line	MP 230 - 240	" 21a, 21b
11. UP	Bieber Line	MP 15 - 25	" 22, 23
12. ATSF	Pasadena Sub.	MP 137 - 138	" 23a, 23b
13. ATSF	San Bern. Sub.	MP 0 - 10	" 23c, 23d
14. UP	LA Subdivision	MP 0 - 10	" 30, 31
15. ATSF	San Diego Line	MP 249 - 259	" 35, 36
16. SP	Shasta (B. Butte Dst)**	MP 319 - 329	" 39 - 43
17. SP	Shasta (Valley Dst.)	MP 299 - 309	" 39 - 43
18. SP	Tehachapi *	MP 342 - 352	" 46, 47
19. ATSF	Needles Sub.	MP 740 - 750	" 50, 51
20. SP	Yuma Line **	MP 536 - 546	" 54, 55
21. SP	Yuma Line **	MP 586 - 596	" 54, 55
22. SP	Yuma Line	MP 668 - 669	" 54, 55

* These areas are encompassed in the areas listed in Table 3.

** These areas are partially encompassed in the areas listed in Table 3.

Table 3 *

	Carrier	Line Description	Segment of Track	App. C Ref.	Table 2 Ref.
23.	ATSF	Cajon Pass	MP 55.9 - 81.5	C-1	1, 2
24.	SP	Siskiyou Line	MP 393.1 - 403.2	C-2	
25.	SP	Shasta Line	MP 368.5 - 338.5	C-3	
26.	SP	Shasta Line	MP 338.5 - 322.1	C-4	16
27.	SP	Roseville Dist #2	MP 137.0 - 111.0	C-5	
28.	SP	Roseville Dist #1	MP 136.0 - 115.1	C-6	
29.	SP	Roseville Dist 1 & 2	MP 208.0 - 143.6	C-7	7
30.	SP	Bakersfield Line	MP 360.5 - 332.1	C-8	18
31.	SP	Bakersfield Line	MP 371.5 - 380.7	C-9	
32.	SP	Saugus Line	MP 417.3 - 438.2	C-10	
33.	SP	Saugus Line	MP 452.8 - 457.2	C-11	
34.	SP	Bakersfield Line	MP 463.0 - 486.0	C-12	
35.	SP	Yuma Line	MP 542.6 - 589.0	C-13	20, [illegible]
36.	UP	Feather River Div	MP 232.1 - 319.2	C-14	3 - 5
37.	UP	L.A. Sub, Cima Grd.	MP 254.6 - 236.5	C-15	
38.	SP	Coast Line	MP 235.5 - 250.5	C-16	6

* A total of 38 sites were identified by either the operational or the statistical method. As noted by the asterisks on Table 2, 11 sites were identified by both methods.

III. Comments

A. Railroad Comments

SP commented on the Report and pointed out that virtually all main line track through mountainous terrain within California is included as a local safety hazard. SP is concerned that this Report might be misconstrued by elected officials, members of the press, and the general public as drawing conclusions that the identified track segments pose a present threat to public safety. SP, and the other railroads, urge the Commission to clarify that our review to date serves as a preliminary screening device, that further analysis is needed to determine whether there are specific sites that should be identified, and that the staff evaluation was made without regard for the federal definition of "essentially local safety hazard" under the Federal Railroad Safety Act (FRSA).

SP notes that it is the respondent in a separate enforcement proceeding, I.91-08-029, which involves an investigation into derailments on SP last summer at Cantara Loop and Seacliff. That rail segment is included in the Report but SP believes it is premature for the Commission to identify that segment of SP's Shasta line (MP 319-329) as a local safety hazard while the proceeding I.91-08-029 is pending. Putting that segment aside, SP is aware of no location on its main line in California that warrants inclusion in the Report. It says that when problem areas come to SP's attention, they are remedied either through application of operating restrictions or by right of way improvements, improved track maintenance procedures, or other means.

SP observes that the Report's accident analysis, which utilizes 16 years of data, does not take into account the dramatic reduction in accident frequencies in recent years. The Report shows that California railroads experienced 0.24 reported accidents per mile for the 16-year period 1976-1991, whereas they experienced

only 0.04 reported accidents per mile for the five-year period 1987-1991.

The Research and Special Programs Administration of the U.S. Department of Transportation (RSPA) issued a notice of proposed rulemaking (NRPM) to amend the hazardous materials regulations to list and regulate, in all modes of transportation, as hazardous materials, those materials which are identified as marine pollutants by the International Maritime Organization (MARPOLE) list. (57 FR 3854.) This addition includes a list of over 500 potential marine pollutants. SP, through the Association of American Railroads, supports the inclusion of marine pollutants to federally regulate these commodities as hazardous materials.

Finally, SP requests that the Commission emphasize that the Report should not be construed as suggesting that rail transportation is any less safe than transportation by other modes. It points out that the rate of incidents involving hazardous materials is more than five times higher for the truck mode than for rail based on recently released statistics compiled by the U.S. Department of Transportation for the period 1983-1990.

ATSF said that it had no recommendations to identify sites on the ATSF which are local safety hazards. It said that a safety hazard must be a source of danger of injury, harm or loss to persons, property or the environment. It asserts that if it knew of any such sites, they would not be allowed to exist. They would be made safe. It is of the opinion that the Report does not identify sites which are safety hazards, rather, it describes a basic methodology used to identify sites which might pose a safety hazard. ATSF urges the Commission to define what is an "essentially local safety hazard" so that the Commission does not intrude in an area that has been preempted by federal law. It believes that any attempt to impose regulations on any sites listed in the Report would be preempted.

ATSF, as well as SP, is concerned that the identification of a "safety hazard" in the Report could lead to a conclusion by the Legislature that the Commission has found that railroads are permitting safety hazards to exist. It wants us to clearly state that the list of "safety hazards" in the Report means only potential safety hazards.

The UP, while adopting the comments in general of SP and ATSF, strenuously objects to the listing of 90 miles of its Feather River line as a local safety hazard. It says that the listing is completely unsupported by any factual basis and is a slap in the face of all of the hard-working and dedicated men and women who have operated and maintained this line since it was built in 1909. UP asserts that since 1983 it has spent millions of dollars in upgrading this line; that the line does not have a mountain grade; that the curves on the line are not excessive; that there have not been a large number of derailments on the line; and that the few derailments that have occurred are within a small portion of the line, certainly not 90 miles. UP compared the Feather River line with lines having similar characteristics which are not included in the Report. UP acknowledges that the Feather River Canyon, through which the line runs, is an environmentally sensitive area, but believes that merely operating through an environmentally sensitive area does not make the railroad line a local safety hazard.

B. Union Comments

The United Transportation Union (UTU) which represents, among others, the operating personnel (conductors, brakemen, firemen, yardmen, and a portion of engineers) on each of the major railroads operating trains within California, as well as certain short lines operating in California, commented on the Safety Division Report. The UTU said that it supports the conclusions of the Report but recommends that we expand the base of accidents beyond the standards set by the FRA. It recommends that factors, other than derailments, be included in determining if a site is a

local safety hazard. It recommends that we should include sites that have a high degree of break-in-two, pulled drawbars, broken knuckles, broken air hoses, and vandalism. The UTU also recommends that railroad operations within yards or terminals be given close scrutiny. The large number of track and the close proximity of trains in yards require extra precautions. Especially because of the amount of hazardous materials carried on trains and the close proximity of yards to large populated areas we should recognize the potential danger to the public, as well as to the railroad and its employees. UTU also recommends that walkways adjacent to railroad tracks, railroad bridges, and railroad tunnels be subject to further review. It points to the particular hazard when a problem arises on a train which requires inspection of a bridge or a tunnel at night. It recommends that all railroad bridges in California have handrails on both sides, as well as adequate walkways on both sides, so that workers may cross in a safe manner for inspection and to repair hazardous conditions. In a similar manner railroad tunnels should be maintained with emergency lighting switches, telephones, and breathing apparatus.

UTU states that over the years it has filed hundreds of reports with the Safety Division regarding what it considers unsafe working conditions and local safety hazards. It believes that a review of those reports will lead to other areas of railroad operations which should be considered as local safety hazards. It further recommends that for the purpose of this proceeding all portions of track adjacent to bodies of water should be considered as local safety hazards. This would include almost all of ATSF's Los Angeles to San Diego line and SP's Roseville to the Oregon border line, as well as Roseville to the Nevada border segments which are adjacent to the Sacramento, Truckee, and American Rivers. Finally, UTU recommends that additional and comprehensive training be given to the operating crews of the train, who are usually first

on the scene, and also to the people to whom they report such as yardmasters and dispatchers.

The Brotherhood of Locomotive Engineers (BLE) supports the Safety Division's Report. It says that the analysis used in the Report is sound and identifies the majority of locations that BLE considers challenging from an operational point of view. In addition to those sites mentioned in the Report, BLE recommends that sites that are subject to heavy concentrations of Tule fog should be included as local safety hazards. BLE disputes UP's comments regarding the potential hazard of the Feather River line. It points out that numerous accidents have happened in the Feather River Canyon and are expected to continue to happen. It agrees that UP has rebuilt the Feather River line and it is in the best shape it has ever been, but the possibility of accident remains and procedures should be implemented to improve safety.

IV. Discussion

We share the concern of the parties that this decision not be construed as a finding that the railroads in California are operating any portion of their facilities in a unsafe manner. We cannot emphasize too strongly that our findings in this decision regarding sites which may be local safety hazards are not only preliminary findings but also are findings of potential local safety hazards. Phase II of this proceeding will determine whether any of these preliminary findings are actual local safety hazards and will promulgate the modifications to operations which will be expected to reduce or eliminate the local safety hazard.

Since the inception of this investigation, and before that at the Legislature, the Class 1 railroads have constantly and consistently hammered at the theme that federal preemption precludes this Commission from a broad investigation of railroad safety hazards. We are aware of the doctrine of federal preemption

in this area - we specifically referred to it in our OII; the Legislature is aware of the issue of federal preemption - they specifically referred to it in the enabling legislation. In this Phase I of the investigation, which is merely fact finding, and preliminary at that, we do not see federal preemption as an impediment to our inquiry. Perhaps, in the implementation Phase II of this investigation federal preemption will become a major issue. We hope not. The comment of ATSF in regard to safety hazards is particularly apt: "If we knew of any such sites, they would not be allowed to exist. They would be made safe." (Exh. 3, p. 1.) That phrase sums up this hearing as well as any phrase that we can devise. We are trying to locate "such sites" and make them safe. It should make no difference to the railroad whether this Commission points out the hazard or whether a federal commission points out the hazard. It is useful, at this juncture, to remind the railroads that there is an agreement between the FRA and this Commission whereby the FRA and the California Public Utilities Commission (CPUC) railroad inspectors monitor rail safety problems throughout California.

We are concerned with the attitude that the Class 1 railroads are taking toward this investigation. Although they have complied with our order regarding submission of data on accidents and hazardous materials, they have not suggested one site as being a possible safety hazard. (Unless we consider the list submitted by UP in Exhibit 4 which names route segments on the SP, ATSF, and UP which it considers remarkably similar to its Feather River route.) In the interest of improving safety we would expect the railroads to be cooperating with, rather than hindering, our investigation.

The Safety Division has filed comments to the position taken by the Class 1 railroads, which, in our opinion, should allay any concern the railroads may have regarding this investigation, and especially their report on potential safety hazards. The

Safety Division comments that its Report is to serve as a preliminary screening device. It uses the terms "tentatively," "pending further review," "further analysis will be needed," etc., to describe the results. The staff recognizes that the exact boundaries of the statistically identified segments of its Report may need further refinement in order to more precisely represent the length and location of the track segment identified.

The staff in its comments has argued that the claims and concerns of the railroads are invalid. It would not be helpful to set forth the arguments because Phase I is not the proceeding to settle disputes. We will be investigating each of these potential safety hazards in Phase II. However, the concern of SP regarding its Cantara Loop segment should be discussed. Briefly, the Cantara Loop OII (I.91-08-029) will not be prejudiced by the present proceeding because the Cantara investigation is to determine a narrower issue and is expected to be completed at an earlier time than Phase II of this investigation. The Cantara OII is limited to the conditions of an accident that occurred there, emphasizing the uphill movement of trains; this Phase I of a general investigation is to look for other possible safety problems. This present investigation is broader in scope than I.91-08-029 as regards the Cantara Loop.

The staff believes, and we concur, that the reporting of accidents to the FRA may have been incomplete. The General Accounting Office has pointed out this underreporting problem and the staff cannot assume that it has been completely remedied. Although there has been a reported reduction in accidents in recent years, the use of a 16-year accident history, rather than a shorter period, is more likely to show the nature of a hazard at a location. Because all of this material is preliminary to a more detailed investigation in Phase II, the use of historical data will be placed in its proper perspective. As the staff observes: "In many technologies, even extremely low accident rates are considered

too hazardous, especially when hazardous materials are involved or there is the potential for their involvement (e.g., nuclear power, toxic gases)."

The Class 1 railroads have made much about their concern that this investigation is treading on the toes of the federal government and that the staff is not directing its attention to local safety hazards, but to more general safety hazards. We have noted, above, our opinion that it is premature to be concerned about federal preemption in this Phase I; nevertheless, as it is certain to be a predominant issue in Phase II and as it is an issue in which the Legislature is obviously interested, we feel it necessary to set forth our views on how we will approach a determination of just what is a "local safety hazard." We are particularly impressed with the analysis given by our staff in its comments.

V. Local Safety Hazard

A. Definition and Application

A fundamental task in this proceeding is to arrive at some description or definition of the term "local safety hazard." 45 U.S.C. § 434. Before examining relevant cases, a brief consideration of the meaning of the key word "hazard" and an application to railroad operations is appropriate.

A "hazard" can be defined as "a source of danger." Webster's New Collegiate Dictionary, 1973. For those involved in public safety efforts, a "hazard" is seen as "an implied threat or danger of possible harm." H. Roland & B. Moriarty, System Safety Engineering and Management (2d Ed, 1983), p. 6. It is a potential for doing harm, a condition that, given a certain stimulus or failure, will become activated. Id. A more technical definition of hazard is the following:

> "A potential condition, or set of conditions, either internal and/or external to a system,

> product, facility, or operation, which, when activated transforms the hazard into a series of events that culminate in a loss (an accident). A simpler and more fundamental definition of hazard is a condition that can cause injury or death, damage to or loss of equipment or property, or environmental harm." Id.

As regards railroad operations, mountain grade and curved territories offer ready examples of potential or inherent hazards. These types of hazards possess an imminent potential for harm should, for example, operating rules be violated or mechanical problems occur when a heavy train is descending a steep grade (e.g., loss of dynamic braking). A dramatic recent example of such potential hazards being activated was the 1989 derailment of the out-of-control SP freight train at the bottom of the Cajon Pass, with fatal consequences for trainmen and nearby residents. Annual Report of Railroad Accidents Occurring in California, 1989 (Official Notice taken).

The mountain environment, in and of itself, is a natural hazard to operations. While the carrier will have issued rules designed to enhance safety of operations within a specified mountain grade territory, it cannot remove the inherent hazards posed by the mountains. Rules may reduce these operational hazards but cannot eliminate the potential safety risks involved in mountain passage.[4]

Heavy grades can have a drastic effect on stopping distance. "On a descending grade, speed will actually increase

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4 A review of ATSF, SP, and UP timetables provides evidence of the additional operating rules placed in effect within mountain grade regions. The Safety Division Report sets forth a summary of "Timetable Grade Restrictions" in effect at specific sites. Exh. 1, Appendix C. See also "Southern Pacific's Rules and Instructions Governing Air Brake System Train Handling," Exh. 1, pp. 13-14.

during the first portion of a brake application, until the brakes become effective and produce retardation," SP has stated.[5] The downhill push of a train due to gravity is always acting to increase speed. Human or mechanical failure can result in uncontrolled ("runaway") trains on mountain grades. Such trains would have been controllable in other operating environments.

With respect to curves, the following has been said:

> "There is definite proof that excessive lateral forces are generated in curve negotiations which can cause rail turnover type derailments on curves in excess of 2 degrees, and particularly on curves of 4 degrees or greater. The lateral forces which can cause this situation come from the dynamic stresses produced by run-ins of slack, by having long cars coupled to short cars, by having long, light cars preceding blocks of heavily loaded cars, by having slack run in against the locomotive, by coupler or truck characteristics, or by high continuous buff or draft forces....
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> "When a heavily powered locomotive consist is hauling a heavy train slowly around a sharp curve, it is very possible that the high tractive effort developed will pull any light cars located in the train over the inner rail, straightening them out like a 'stringline.' The cars may be pulled over the inner rail by the flange climbing the inner rail, by the inner rail turning over, or the car may be rolled inwards."

Track Train Dynamics to Improve Freight Train Performance, (Government-Industry Research Program on Track Train Dynamics) 1973, p. 2-149.

To make more tangible the concept of operational problems and their potential for harm in mountain grade and curved

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5 Southern Pacific Train and Engine Operation, p. 21-22.

territory, it can be noted that ATSF, operating over SP track in the Tehachapi Mountains between Bakersfield and Mojave, continues to have derailments. Specifically, on January 20, 1992, at 12:10 p.m. at Rowen, Train 1-976-26 derailed three cars with $7,858 in track damage. The cause was excessive buff or slack action (train handling). On August 22, 1991, at 2:30 a.m. at Bealville Siding, Train 1-976-21 derailed five cars with track and signal damage of $13,500, car damage of $93,500 and a cost of clearing of $6,060. The cause was the stringlining of curve number 31. On September 8, 1991, at 4 a.m. at Cliff, Train 1-976-07 derailed seven cars with $5,000 in track damage, $43,000 in car damage and $8,700 for the cost of clearing. The cause was the stringlining of curve number 45. Plainly, there are numerous safety problems and a potential for harm associated with the difficult terrain through which railroads often operate.

B. Cases and Statutes

The relevant cases and statutes also offer direction for understanding the term "local safety hazard."

Preliminarily, it is beyond dispute that the FRSA, codified at 45 U.S.C. § 421 et seq., authorizes ("clearly allows") states to regulate railroad safety under certain circumstances. Union Pacific R. v. Public Utility Commission of Oregon, 723 F. Supp. 526, 529 (D. Or. 1989). The circumstance at issue is when the state deems its regulation necessary "to eliminate or reduce an essentially local safety hazard" and its regulation is not incompatible with federal regulation and does not create an undue burden on interstate commerce.

As legislative history demonstrates, Congress enacted the savings clause in § 434 with the following intent:

> "The purpose of this provision is to enable the States to respond to local situations not capable of being adequately encompassed within uniform national standards. The States will retain authority to regulate individual local problems or reduce essentially local railroad

> safety hazards.' Since these local hazards would not be Statewide in character, there is no intent to permit a State to establish Statewide standards superimposed on national standards covering the same subject matter."

H.R. Rep. No. 1194, 91st Cong., 2d Sess., reprinted in 1970 U.S. Code Cong. & Admin. News 4104, 4117 (Emphasis in original); See National Association of Regulatory Utility Commissioners v. Coleman, 542 F.2d 11, 14-15 (3d Cir. 1976) and Missouri Pacific Railroad v. Railroad Comm. of Texas, 671 F.Supp. 466, 470-471 (W.D. Tex. 1987).

Permitting the states this authority is wholly compatible with the goals set forth in the FRSA, namely, "to promote safety in all areas of railroad operations and to reduce railroad-related accidents, and to reduce deaths and injuries to persons and to reduce damage to property caused by accidents involving any carrier of hazardous materials." 45 U.S.C. § 421 (Emphasis added). See Union Pacific Railroad v. PUC of Oregon, supra, 723 F. Supp. at 528-529.

Reason demonstrates that the goals of the FRSA are served by having states address their own local safety problems. Nationwide federal rules can hardly be crafted to meet the myriad circumstances affecting rail safety across a geographic expanse as diverse as the United States. Given the nationwide focus of federal regulations, purely local problems would remain unaddressed in rulemaking, absent state authority granted under § 434.

Besides being eminently reasonable, a limited state rulemaking authority is consistent with the expanded partnership now existing between federal railroad safety regulators and the states. Under this cooperative arrangement the FRA and the CPUC railroad inspectors monitor rail safety problems throughout California. State detection of local safety hazards requires a corresponding remedial authority, as § 434 provides.

Additionally, California's heightened concern for the environment and its huge and expanding population make the purposes of the FRSA, as set forth in § 421, even more vital today than when the Act was passed in 1970. As two major railroad accidents demonstrated last year, the stakes are higher now in California, and rail accidents can have very lengthy and far-reaching effects. A derailment involving a toxic substance can shut down a major highway and inconvenience many thousands of motorists. Likewise, toxic discharges into waterways not only can destroy stream life but also have the potential to pollute vast reservoirs.

The cases include situations where the courts rejected the "local safety hazard" claim as it was applied to state requirements for cabooses[6] and bridge and trestle walkways[7] but upheld state regulations with respect to drainage ditches,[8] excessive vegetation near a right-of-way,[9] trackside fire safety,[10] and a block signal before a blind curve.[11]

In line with this it should be noted that the drainage ditches ordered cleared in Seaboard Coast Line (See ftn. 8) ran beside a four-mile segment of track (the "Lumberton to Wilmington

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6 Union Pacific Railroad v. PUC of Oregon, supra.

7 Norfolk & Western Ry. v. Public Utilities Com'n, 926 F.2d 567 (6th Cir. 1991).

8 State ex rel. Utilities Com'n v. Seaboard Coast Line R. Co., 303 S.E.2d 549 (1983).

9 Missouri Pacific Railroad Co. v. Railroad Comm. of Texas, 833 F.2d 570 (5th Cir. 1987); Easterwood v. CSX Transp., Inc., 933 F.2d 1548 (11th Cir. 1991).

10 State v. Chicago, M., St. P. & P.R. Co., 484 P.2d 1146 (1971), Appeal dismissed 404 U.S. 804.

11 Monongahela Connecting R. Co. v. Pennsylvania Public Utilities Com'n., 404 A.2d 1376 (1979).

track between mileposts 302 and 306"). Also, in State v. Chicago (See ftn. 10) the state spark-arrester regulation at issue was aimed at a hazardous situation apparently widespread within the State of Washington. Railroad violations at two separate locations are noted in the decision, wherein the court declared that "[t]he danger of fires along railroad rights-of-way may clearly be characterized as 'an essentially local safety hazard.'" 484 P.2d at 1149.

A main stumbling block for states appears to be regulations that have statewide application. But regulations that are directed and particularized to local safety problems appear to have every chance of passing federal preemption muster. In any event, there is no preemption provision affecting the listing of potential safety hazards. Thus, the Commission, in listing problem sites during Phase I of the instant investigation, acts wholly within its authority.

Findings of Fact

The first five findings of fact are in direct response to the legislative direction in PU Code § 7711.

1. "(a) A list, prepared pursuant to Section 59019 of the Health and Safety Code, of all commodities transported on railroad lines in the state that could pose a hazard to the public or the environment in the event of a train derailment or other accident."

The requested list is being prepared by the Office of Environmental Health Hazard Assessment and is not due until July 1, 1992, too late to be included with this decision. It will be forwarded upon receipt.

2. "(b) A description of the quantities of commodities identified in subdivision (a) that are transported on railroad lines in the state. The commission shall also describe the locations and routes at, and on, which the commodities specified in subdivision (a) are transported.

> Railroad corporations shall provide to the commission all information necessary to comply with this subdivision."

Railroads are only required to keep records of the hazardous materials that are on the U.S. Department of Transportation list (49 CFR 172.101). The railroads say that they are unable to provide information on material not listed in 49 CFR 172.101. (We note that 49 CFR 172.101 contains a list of hazardous materials compiled in 90 pages of small print with an appendix of additional hazardous materials complied in 135 pages of small print.)

The three Class 1 railroads have submitted the information required by this subdivision, which have been marked Exhibit 6 (SP), Exhibit 7 (UP), and Exhibit 8 (ATSF) in this proceeding, a copy of which will be forwarded to the Legislature with this decision.

3. "(c) A list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years. The list shall describe the nature and probable causes of the accidents, if known."

The list in response to this subdivision is found in Exhibit 5 in this proceeding, a copy of which will be forwarded to the Legislature with this decision. To provide a summary and analysis of the accidents in this period we shall include the Annual Report of Railroad Accidents Occurring in California, for the years 1987-1990, prepared by this Commission, with our response to the Legislature. The 1991 report will be delivered to the Legislature when issued.

4. "(d) A list of all railroad sites in the state that the commission determines pose a local safety hazard."

We determine that the sites described in Table 2 and Table 3 of this decision pose a potential safety hazard. In

reaching our determination we have considered the severity of grade and curve of track. The remaining factors set forth in § 7711(d) will be considered in Phase I-I of this proceeding.

5. "(e) In determining which railroad sites pose a local safety hazard pursuant to subdivision (d), the commission shall consider the history of accidents at or near the sites. The commission shall not limit its determination to sites at which accidents have already occurred, but shall identify potentially hazardous sites based on the criteria enumerated in subdivision (d) and all other criteria that the commission determines influence railroad safety."

We have considered the history of accidents at or near the sites, as set out more particularly in Table 3 of this decision and Appendix B in the Report. Other criteria shall be considered in Phase II.

6. PU Code § 765.5(b) states:

"(b) Not later than July 1, 1992, and annually thereafter, the commission, consistent with Section 434 of Chapter 13 of Title 45 of the United States Code, shall identify track sections which it determines pose local safety hazards, and report on those sites to the Legislature. The commission shall include in its report at least all those sites which have inordinately high derailments rates, as determined by the commission."

The track sections which we determine to pose potential local safety hazards which have inordinately high derailment rates are set forth in Table 2 of this decision.

Conclusion

To meet the requirements of PU Code § 7711 and PU Code § 765.5 we must attach voluminous records to this decision. To make those records appendices to this decision would require many hundred more pages, whose cost would far exceed any possible

enlightenment. Instead, we shall send two copies of those records to the Legislature, retaining the original in our public files open for inspection.

INTERIM ORDER

IT IS ORDERED that the Executive Director shall forthwith serve a copy of this decision on the Senate and on the Assembly of California together with copies of Exhibits 1, 5, 6, 7, and 8 filed in this investigation and together with copies of this Commission's Annual Report of Railroad Accidents Occurring in California for the years 1987, 1988, 1989, and 1990.

This order is effective today.

Dated July 1, 1992, at San Francisco, California.

DANIEL Wm. FESSLER
President
JOHN B. OHANIAN
PATRICIA M. ECKERT
NORMAN D. SHUMWAY
Commissioners

I CERTIFY THAT THIS DECISION WAS APPROVED BY THE ABOVE COMMISSIONERS TODAY

NEAL J. SHOAMAN, Executive Director