ITEM NO. 8

BNSF Rail Testing Risk Factors for Determining Frequency of Inspections

BNSF

Rail Defect Detection

BNSF operates 25-32 rail defect detection vehicles over all main tracks, sidings, and designated yard tracks, with test frequencies ranging from 30 to 365 days. Three of the test vehicles are owned and the remainder are under multi-year service contracts. The objective of these vehicles is to identify internal rail defects so that remedial repairs can be made prior to the defect resulting in a service failed broken rail. It should be noted that not all internal rail defects are detectable. Each of the three contract rail defect detection service providers are engaged in R&D to improve the efficiency of rail defect detection.

Risk factors, defined as desired maximum internal defect service failures per mile per year, have been established for each mainline subdivision. To determine risk factor for a subdivision, we start with a baseline factor of 0.09. This is slightly lower than industry average 0.10-0.15 service failures/mile/year range. At 0.09 we are attempting to set D-car frequency so that during a 12 month period we have no more than nine internal defect service failures per 100 miles. We then reduce from baseline for traffic and operational considerations as follows:

- Passenger trains, -0.02
- AAR Hazmat Key Route (10,000 cars hazmat/year), -0.01
- Nonsignaled territory, -0.02
- Single track, -0.01

For example, for a single-track non-signaled segment with no passenger trains and hazmat less than 10,000 cars/year, risk factor would be 0.09 (baseline) –0.02 (for no signals) -0.01 (for single track) = 0.06.

We use a rail test scheduling system from consulting firm Zeta-Tech that analyzes our defect statistics and recommends test frequency for each subdivision to keep internal defect service failures below risk factor. Defect rates drive the model, so factors that influence defect rates, such as rail conditions, wheel loads, annual tonnage, and accumulated tonnage, automatically are built into the model. The system is based on Weibull statistical analysis that anticipates rail degradation. As defect rates change over time, the system automatically adjusts rail test frequencies to keep service failures below risk factor.

To avoid overscheduling rail detection, the model does not consider defects that are not detectable with ultrasonic test cars. These include rail base defects, and thermite weld web and base defects. Crushed heads are not internal defects and are not considered by the model, since they are visible without ultrasonic test equipment.

Rail Detection Target Frequencies - North Operations
September 2000 - March 2001

Division	Sub Division	Line Segment	Station From	Milepost From	Station To	Milepost To	Track	Total Miles	Ann MGT	09/01/99 - 03/31/00 Internal Defects	Def/Mile Per Year	09/01/99 - 03/31/00 Service Defects	Risk Factor	Last Avg Test Days	09/01/00-03/31/01 Rec Freq	09/01/00-03/31/01 Target Freq	MGT/Per Test
NE	Bayard	134	Council Bl	382.50	Bayard	484.75	S	102.25	1.11	2	0.03	0	0.06	160	1000	365	1.1
NE	Beatrice	152	Crete	0.70	Wymore	42.60	S	41.90	0.91	10	0.41	3	0.06	203	140	180	0.5
NE	Bellwood	147	Seward	25.50	Columbus	66.50	S	41.00	1.44	59	2.47	0	0.06	208	1000	365	1.4
NE	Benedict	148	York	135.20	Benedict	144.00	S	8.80	0.13	0	0.00	0	0.06	383	1000	365	0.1
NE	Council Bifs	136	Pac Jct	475.00	Council Bifs	496.14	S	21.14	5.61	0	0.00	0	0.06	166	1000	365	5.6
NE	Creston	1	Creston	392.90	Balfour	466.45	S	46.10	103.52	65	2.42	10	0.06	41	32	30	8.5
NE	Creston	1	Prescott	405.70	Pacific Jct	475.10	1	36.10	22.18	41	1.95	2	0.07	41	38	30	1.8
NE	Creston	1	Prescott	405.70	Pacific Jct	475.10	2	36.10	81.52	39	1.85	9	0.07	48	33	30	6.7
NE	Creston	2	Pacific Jct	0.00	Oreapolis	8.87	S, 1, 2	12.74	115.53	35	4.71	8	0.06	36	13	30	9.5
NE	Creston	2	Oreapolis	8.87	Ashland	35.09	S	26.22	105.13	41	2.68	8	0.06	31	21	30	8.6
NE	Creston	2	Ashland	35.09	Lincoln	60.07	1, 2	49.96	66.59	54	1.85	9	0.07	30	23	30	5.5
NE	Farragut	93	Red Oak	0.40	Farragut	25.60	S	25.20	0.26	39	2.65	0	0.06	387	1000	365	0.3
NE	Giltner	160	GH Jct	0.40	Aurora	26.40	S	26.00	1.55	2	0.13	0	0.06	144	1000	365	1.5
NE	Hastings	163	Cushman	3.90	Cobb	7.80	S	3.90	23.19	0	0.00	0	0.06	95	362	120	7.6
NE	Hastings	2	Lincoln	60.07	Aurora Line Jc	154.91	S	94.84	23.00	23	0.42	0	0.06	99	224	120	7.6
NE	Hastings	2	Aurora Line Jct	154.91	McCook	287.80	1, 2, S	135.99	20.26	16	0.20	2	0.06	98	409	120	6.7
NE	Lester	159	Hastings	0.70	Lester	37.00	S	36.30	0.92	63	2.97	0	0.06	392	1000	180	0.5
NE	Napier	16	Napier	97.40	Pacific Jct	173.90	S	76.50	8.32	9	0.20	1	0.06	89	922	180	4.1
NE	Omaha	137	Omaha-Oreapolis	0.00	Ashland	47.00	S, 1, 2	49.28	13.76	16	0.56	2	0.06	57	54	50	1.9
NE	Palmer	149	Aurora	0.60	Marquette	11.00	S	10.40	0.20	13	2.14	0	0.06	384	1000	365	0.2
NE	Ravenna	4	Pleasant Dale	14.58	McDonald	99.21	S	36.19	197.70	60	2.84	5	0.08	31	29	30	16.2
NE	Ravenna	4	Cushman	4.40	Ravenna	127.70	1	87.11	98.85	33	0.65	4	0.09	35	57	30	8.1
NE	Ravenna	4	Cushman	4.40	Ravenna	127.70	2	87.11	98.85	42	0.83	10	0.09	34	32	30	8.1
NE	Sioux City	144	Ashland	0.04	Sioux City	108.00	S	107.96	23.63	39	0.62	11	0.08	85	61	60	3.9
NE	St Joseph	16	Clarke	7.90	Napier	97.40	S, 1, 2	100.04	116.94	120	2.06	13	0.07	32	29	30	9.6
NE	St Joseph	3000	Napier	97.40	Table Rock	145.00	S	47.60	98.50	45	1.62	11	0.07	27	20	30	8.1
NE	St Joseph	3000	Table Rock	145.00	Carling	207.50	S, 1, 2	72.90	99.03	66	1.55	19	0.07	26	19	30	8.1
NE	Wymore	19	Table Rk	48.20	Oxford	257.40	S	209.20	0.34	51	0.42	0	0.06	364	1000	365	0.3