KTECH RAIL SERVICES INC

CANADIAN HEARTLAND TRAINING RAILWAY

Securement of Freight Car Equipment

Disaster brings about change

- 6 million litres of crude oil released
- 47 people dead (42 confirmed)

- 2000 people forced from their homes
- Much of the downtown core destroyed

Disaster brings about change

- The train was parked on a .92% downgrade
- Hand brakes were applied on all 5 locomotives and 2 other cars
- Effectiveness was tested, however the locomotive air brakes were not released during the test. This gave the false impression that the hand brakes alone would hold the train..

Disaster brings about change

Government of Canada | Gouvernement du Canada

On 23 July 2013, TC Pursuant to section 33 of the RSA issued an emergency directive (which was to remain in effect until 31 December 2013). and pursuant to section 36 of the RSA, federal and local railway companies were ordered to file with the Minister, within 7 days, their special instructions on hand brakes, referred to in CROR 112.

On 23 July 2013, pursuant to section 19 of the RSA, TC issued Ministerial Order 07-2013, ordering all federally regulated railway companies and local railway companies to formulate and, as the case may be, to revise, within 120 days (by 20 November 2013), rules respecting the safety and security of unattended locomotives and uncontrolled movements.

On 24 December 2013, TC issued another emergency directive similar to the one issued on 23 July 2013. It was issued to local railway companies, some of which were not covered by the earlier directive. The emergency directive was to be in effect for 6 months or until rules are approved for all companies.

On 30 December 2013, TC issued an order under section 36 of the RSA to all Railway Association of Canada (RAC) member railways to file their special instructions on CROR 112, governing the testing of the effectiveness of hand brakes.

How does it effect you?

Non-Main Tracks

When equipment is left unattended, a sufficient number of hand brakes must be applied and tested for effectiveness.

Unless otherwise indicated in special instructions, apply a minimum number of hand brakes as indicated in the chart (g).

Alberta Industrial Railway Operating Rule

Unless otherwise directed by general operating instructions, a sufficient number of hand brakes must be applied on equipment left at any point to prevent it from moving.

How does it effect you?

- Federally regulated Main Track, Subdivision Track, Siding or High Risk Location..

Total Trailing Tons:	Average Grade is Equal To or Less Than												
	0.2%	0.4%	0.6%	0.8%	1.0%	1.2%	1.4%	1.6%	1.8%	2.0%	2.2%	2.4%	> 2.4%
0 - 2000	2	2	2	4	6	6	8	10	10	12	12	14	
> 2000 - 4000	2	2	4	6	8	12	14	16	18	20	22	26	
> 4000 - 6000	2	6	6	10	14	16	20	24	28	30	34	38	
> 6000 - 8000	4	6	8	12	18	22	26	32	36	42	46	52	
> 8000 - 10000	4	6	10	16	22	28	34	40	46	52	58	66	
> 10000 - 12000	4	8	12	20	26	34	40	48	56	64	72	80	
> 12000 - 14000	6	8	14	22	30	40	48	58	66	76	84	96	
> 14000 - 16000	6	10	16	26	36	46	56	66	76	88	98	110	
> 16000 - 18000	6	10	18	28	40	50	62	74	86	100	112	126	
> 18000 - 20000	8	12	20	32	44	58	70	84	98	112	128	146	
> 20000 - 22000	8	12	22	36	50	64	78	94	110	100% Hand Brakes			
> 22000 - 24000	8	12	24	38	54	70	86	104	122				
> 24000 - 26000	10	14	26	42	58	76	94	112	134				
> 26000 - 28000	10	14	28	46	64	82	104	124	148				
> 28000 - 30000	12	16	30	50	68	90	110	136	162				
> 30000	12	16	34	52	74	96	120	148	172				

Where do the numbers come from?

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Hand Brake Force

AAR standards require that hand brakes on new cars must have a net gross rail load ratio of 10%. On a 286K car, that results in approximately 8580 lbs of retarding force. **However…..**

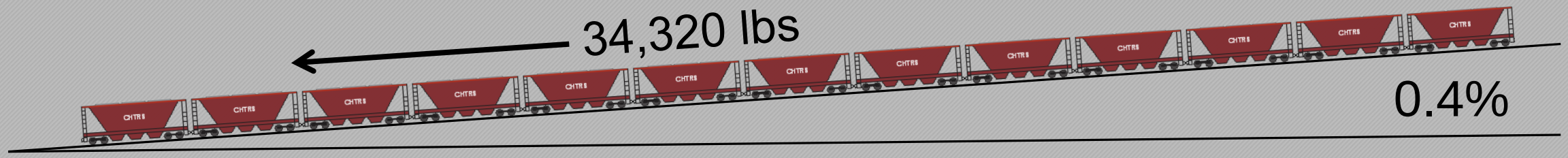
Not all cars are new!

As efficiencies are lost with system wear and tear, the industry has chosen to use 6000 lbs of retarding force per hand brake as a standard.

Where do the numbers come from?

Lets say you have 30 loaded 286,000 lb cars (143 tons per car).
30 X 143 = 4290 tons. The track has a downgrade of 0.4%.

The grade force created by the 30 cars would be 34,320 lbs.



34,320 divided by 6000 = 5.72 (6) Hand Brakes

Total Tons:	0.2%	0.4%
0 - 2000	2	2
> 2000 - 4000	2	4
> 4000 - 6000	2	6

What is the next key factor?

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Hand Brake Effectiveness!!!!!

There are several factors involved with Handbrake effectiveness.

- Fatigue.
- Type and age of equipment.
- Weather conditions.
- Physical capabilities of the individual applying the brakes.

Testing Hand Brake Effectiveness

After applying sufficient hand brakes, release the airbrakes on the cars (if applied) and release the brakes on the locomotive or Rail Car Mover.

Allow the slack to adjust if operating on a grade or use the locomotive or RCM to push or pull on the cars and note that the brakes prevent the cars from moving.

Conclusion

When developing your securement procedures, consideration has to be given to all the factors involved when coming up with the number of hand brakes required.

In the end, make sure the effectiveness of the brakes are properly tested before leaving equipment unattended.

Industry needs to insure that they are well represented when it comes to the development of rules and practices for industrial railways.