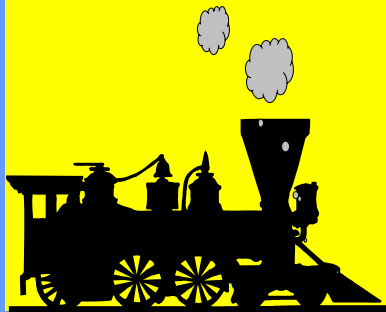


Human Factor Caused Accidents / Incidents

**FRA Analysis of Human Factor
Caused Accidents**

RSAC Meeting

May 18, 2005



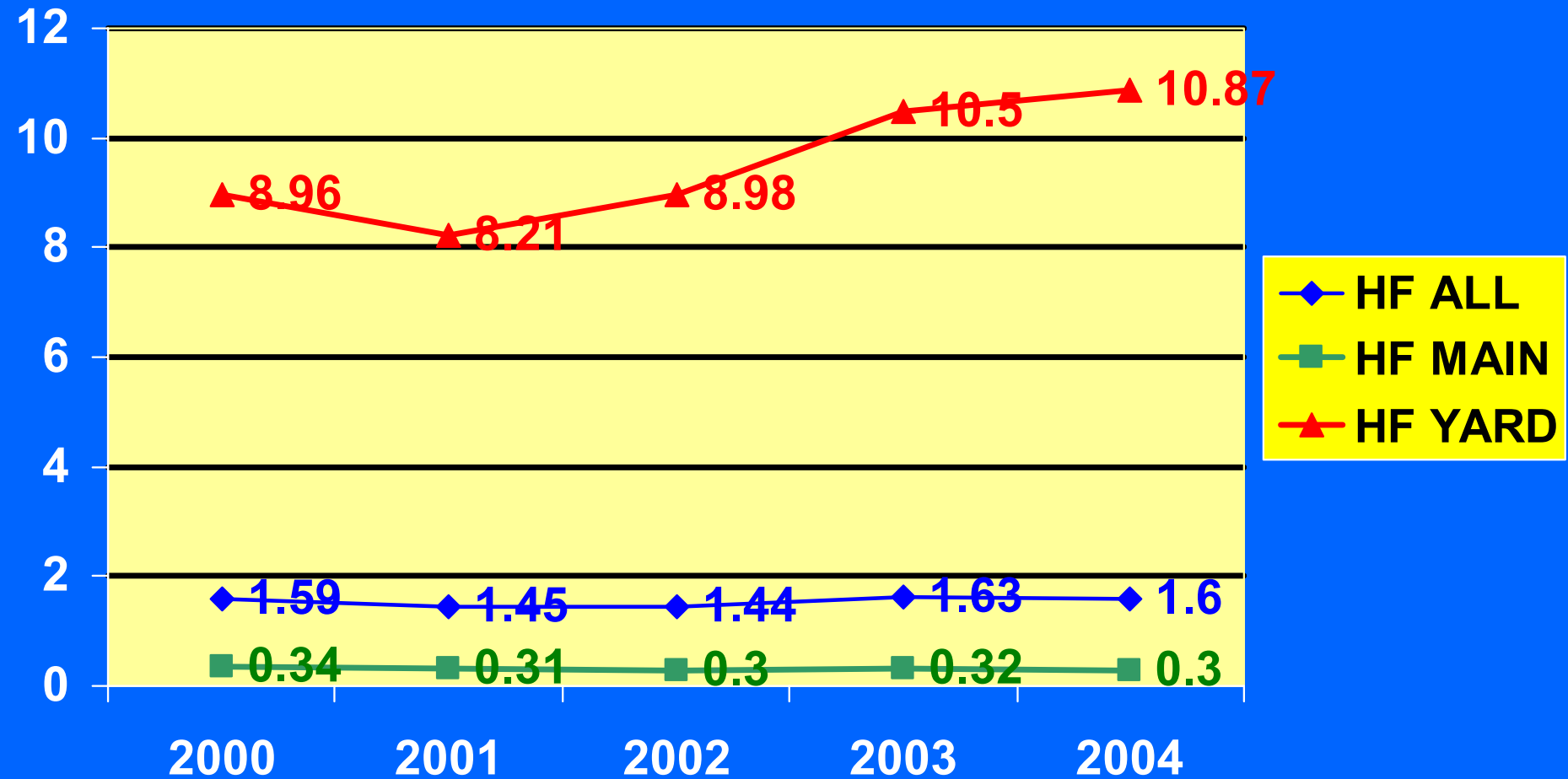
HF Accidents, All Class of Track By Cause Code

	Total		Total Year Counts			YTD Counts Jan - Dec		% Change Over Time		
	Accs	Pct of Total	2001	2002	2003	2003	2004	2001 to 2003	2002 to 2003	To Dec 2003 2004
----GRAND TOTAL.....	4,560	100.0	1,035	1,050	1,213	1,213	1,262	17.2	15.5	4.0
H702 Switch improperly lined	751	16.5	156	168	225	225	202	44.2	33.9	-10.2
H306 Shoving movement, absence of man	508	11.1	111	89	147	147	161	32.4	65.2	9.5
H503 Buff/slack action excess, trn handling	222	4.9	54	37	76	76	55	40.7	105.4	-27.6
H307 Shoving movement, failure to control	192	4.2	33	42	53	53	64	60.6	26.2	20.8
H302 Cars left foul	190	4.2	47	49	49	49	45	4.3	.	-8.2
H704 Switch previously run through	181	4.0	37	36	47	47	61	27.0	30.6	29.8
H018 Fail to secure car hnd brk -rr emp	163	3.6	48	36	39	39	40	-18.8	8.3	2.6
H020 Fail to apply suff. hand brakes -rr emp	163	3.6	34	51	42	42	36	23.5	-17.6	-14.3
H312 Passed couplers	137	3.0	36	28	38	38	35	5.6	35.7	-7.9
H303 Derail, failure to apply or remove	129	2.8	28	40	27	27	34	-3.6	-32.5	25.9
H601 Coupling speed excessive	96	2.1	29	28	22	22	17	-24.1	-21.4	-22.7
H399 Other general switching rules	94	2.1	24	25	25	25	20	4.2	.	-20.0
H605 Failure to comply with restricted speed	82	1.8	24	35	11	11	12	-54.2	-68.6	9.1
H703 Switch not latched or locked	74	1.6	25	11	15	15	23	-40.0	36.4	53.3
H999 Other train operation/human factors	67	1.5	16	20	20	20	11	25.0	.	-45.0
H310 Failure to couple	66	1.4	15	16	14	14	21	-6.7	-12.5	50.0
H021 Fail to apply car hnd brks -rr emp	65	1.4	9	20	14	14	22	55.6	-30.0	57.1
H305 Instruction to trn/yard crew improper	60	1.3	13	11	18	18	18	38.5	63.6	.
H525 Independent brake, improper use	59	1.3	12	14	17	17	16	41.7	21.4	-5.9
H607 Failure to comply with restricted speed	56	1.2	.	.	21	21	35	.	.	66.7
H504 Buff/slack action excess, trn make-up	51	1.1	9	16	11	11	15	22.2	-31.3	36.4
H301 Car(s) shoved out & left out of clear	46	1.0	9	12	12	12	13	33.3	.	8.3

HF Accidents, Class I Track By Cause Code

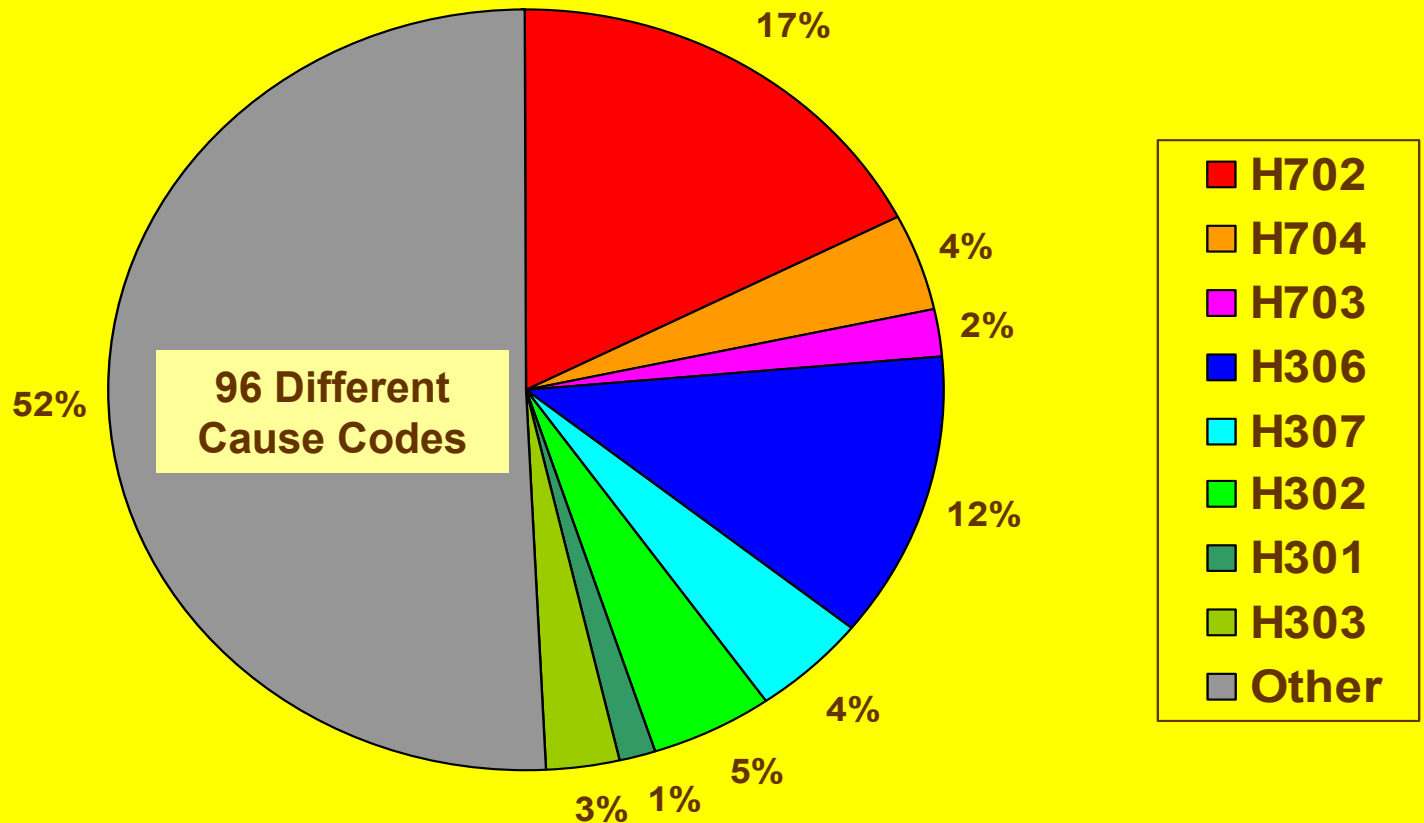
	Total		Total Year Counts			YTD Counts Jan - Dec		% Change Over Time		
	Accs	Pct of Total	2001	2002	2003	2003	2004	2001 to 2003	2002 to 2003	To Dec 2003 2004
H Human Factors	3,515	100.0	788	799	939	939	989	19.2	17.5	5.3
H702 Switch improperly lined	611	17.4	128	136	187	187	160	46.1	37.5	-14.4
H306 Shoving movement, absence of man	436	12.4	95	76	128	128	137	34.7	68.4	7.0
H302 Cars left foul	171	4.9	43	46	45	45	37	4.7	-2.2	-17.8
H503 Buff/slack action excess, trn handling	159	4.5	40	29	55	55	35	37.5	89.7	-36.4
H020 Fail to apply suff. hand brakes -rr emp	155	4.4	32	48	41	41	34	28.1	-14.6	-17.1
H307 Shoving movement, failure to control	152	4.3	22	36	41	41	53	86.4	13.9	29.3
H704 Switch previously run through	146	4.2	28	32	40	40	46	42.9	25.0	15.0
H018 Fail to secure car hnd brk -rr emp	130	3.7	38	29	27	27	36	-28.9	-6.9	33.3
H312 Passed couplers	127	3.6	32	26	36	36	33	12.5	38.5	-8.3
H303 Derail, failure to apply or remove	106	3.0	23	30	21	21	32	-8.7	-30.0	52.4
H399 Other general switching rules	81	2.3	21	21	20	20	19	-4.8	-4.8	-5.0
H601 Coupling speed excessive	78	2.2	24	22	18	18	14	-25.0	-18.2	-22.2
H703 Switch not latched or locked	67	1.9	25	8	13	13	21	-48.0	62.5	61.5
H310 Failure to couple	61	1.7	14	15	12	12	20	-14.3	-20.0	66.7
H021 Fail to apply car hnd brks -rr emp	57	1.6	7	18	12	12	20	71.4	-33.3	66.7
H305 Instruction to trn/yd crew improper	53	1.5	9	8	18	18	18	100.0	125.0	.
H605 Failure to comply with restricted speed	43	1.2	14	21	4	4	4	-71.4	-81.0	.
H607 Failure to comply with restricted speed	42	1.2	.	.	13	13	29	.	.	123.1
H301 Car(s) shoved out & left out of clear	41	1.2	6	10	12	12	13	100.0	20.0	8.3

5 Year HF Trends Per Million Train Miles



2001 –2004 Totals

HF Accidents on Class I Track*

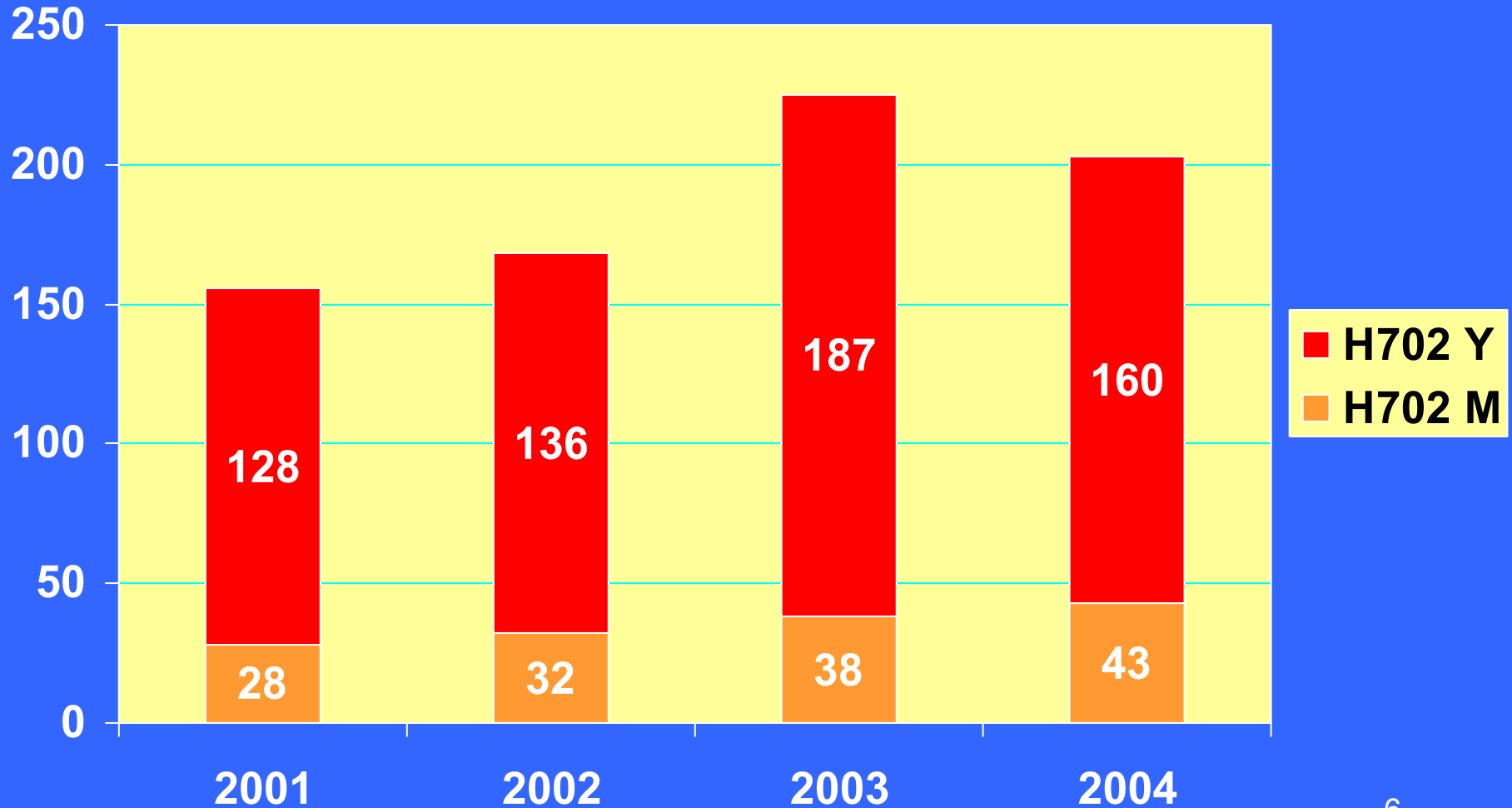


* 3,515 of 4,548 (77%) HF Accidents occurred on Class I Track

H702 Switch Improperly Lined (611) H704 Switch Previously Run Through (146) H703 Switch Not Latched or Locked (67)
H306 Shoving Movement, Absence of Man (436) H307 Shoving Movement, Failure to Control (152)
H302 Cars Left Foul (171) H301 Cars Shoved Out & Left Out of Clear (41) H303 Derail, Failure to Apply or Remove (106)

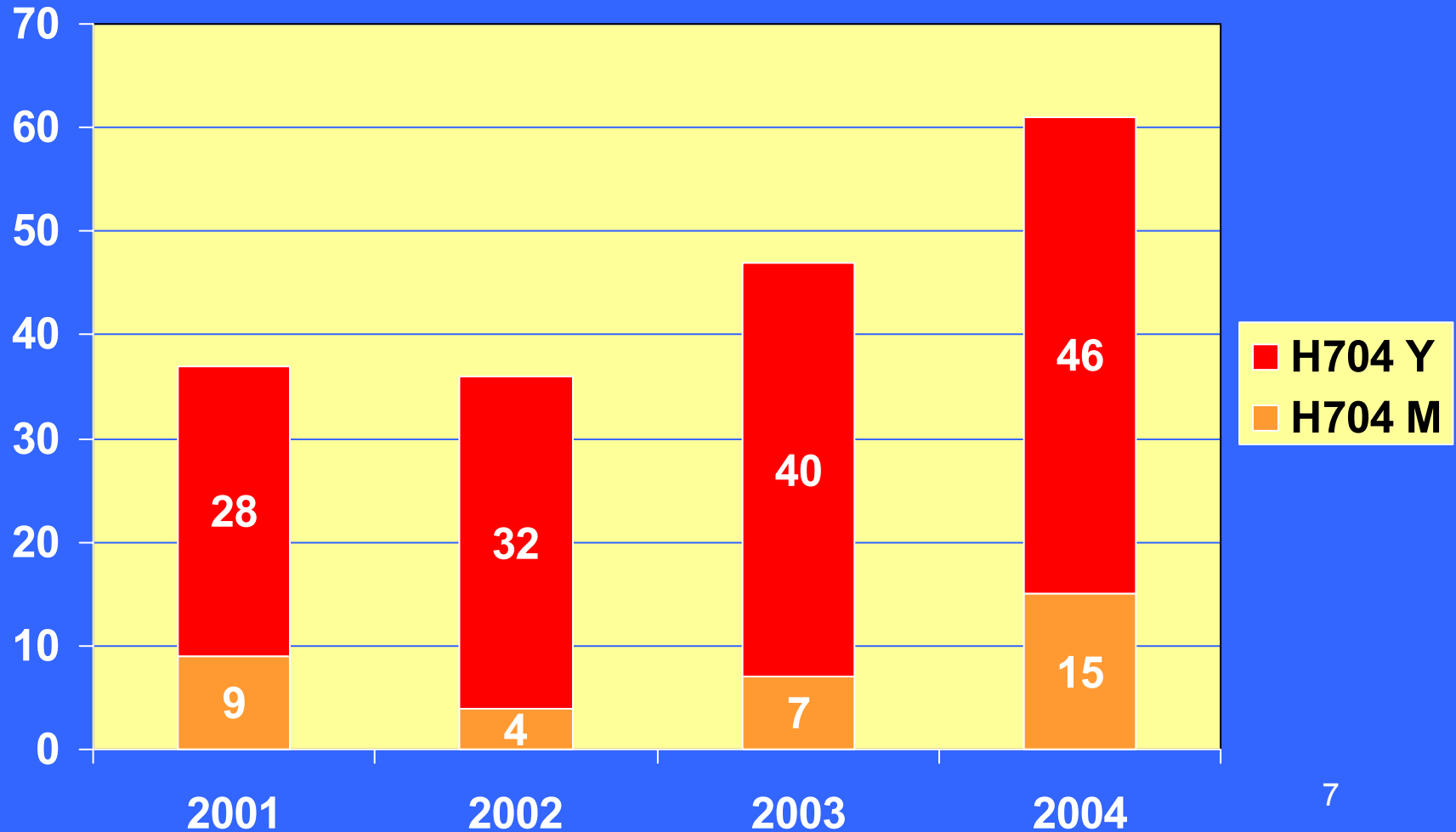
H702

Switch Improperly Lined



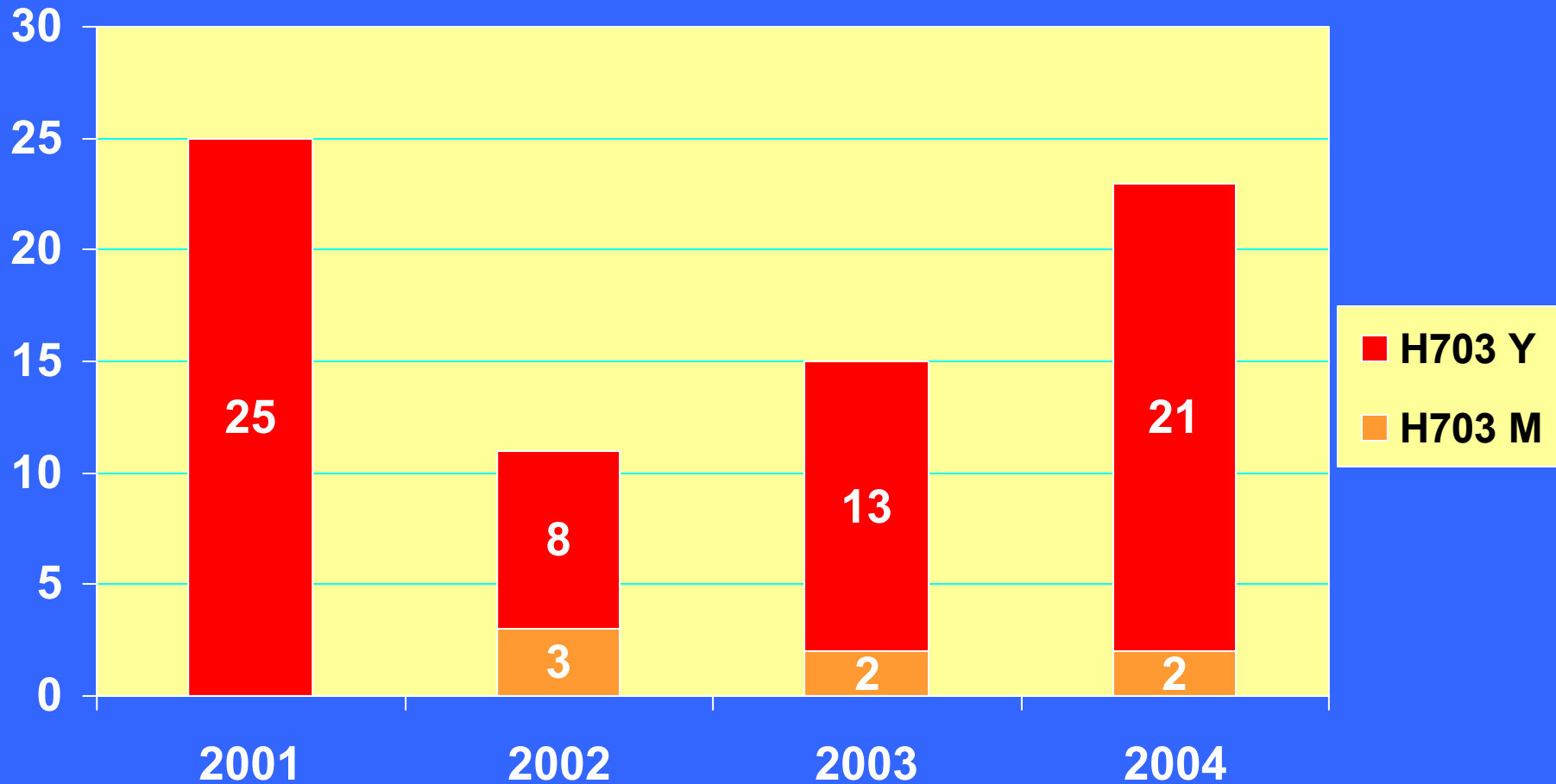
H704

Switch Previously Run Through



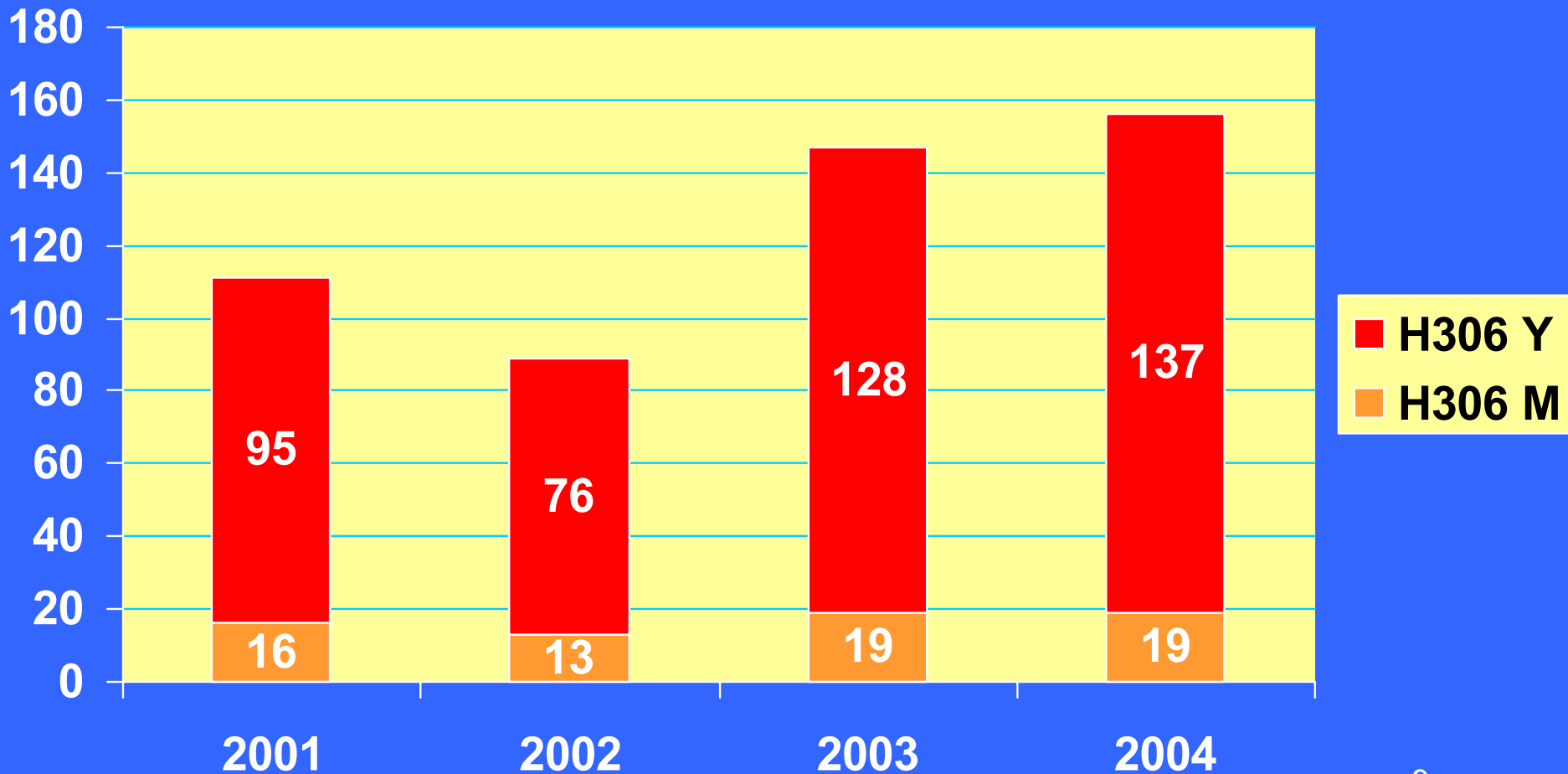
H703

Switch Not Latched or Locked



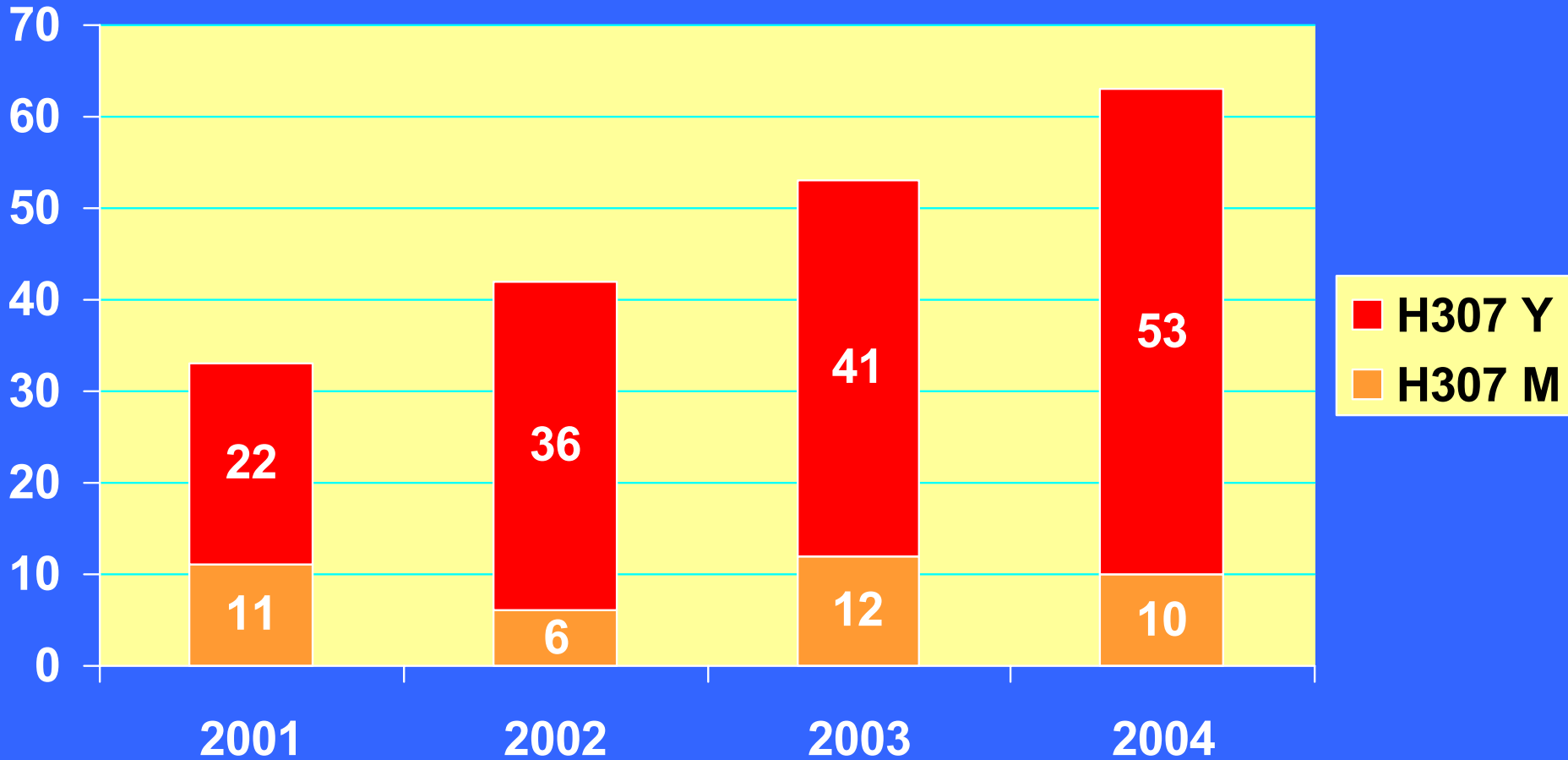
H306

Shoving Movement, Absence of Man



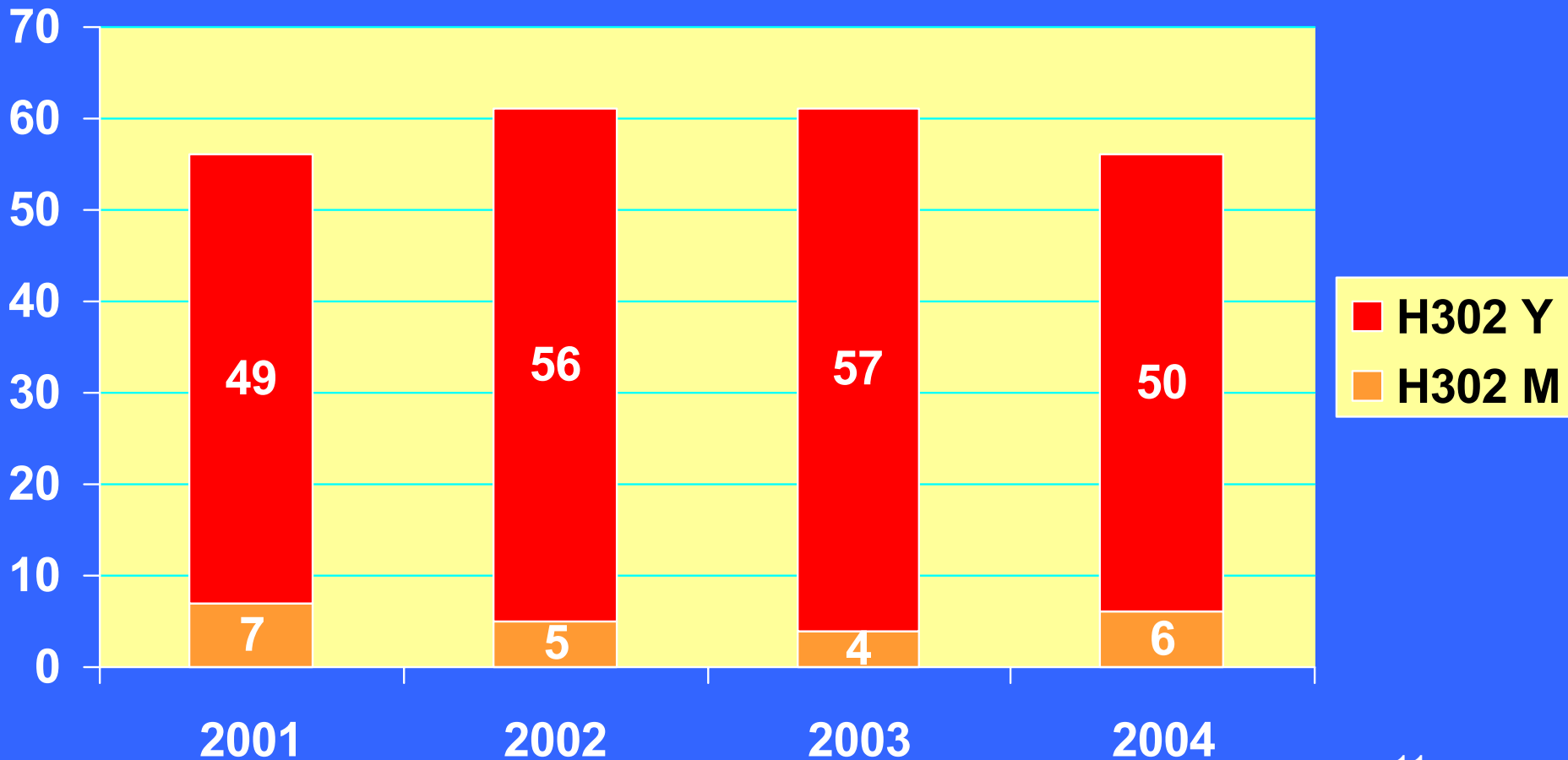
H307

Shoving Movement, Failure to Control



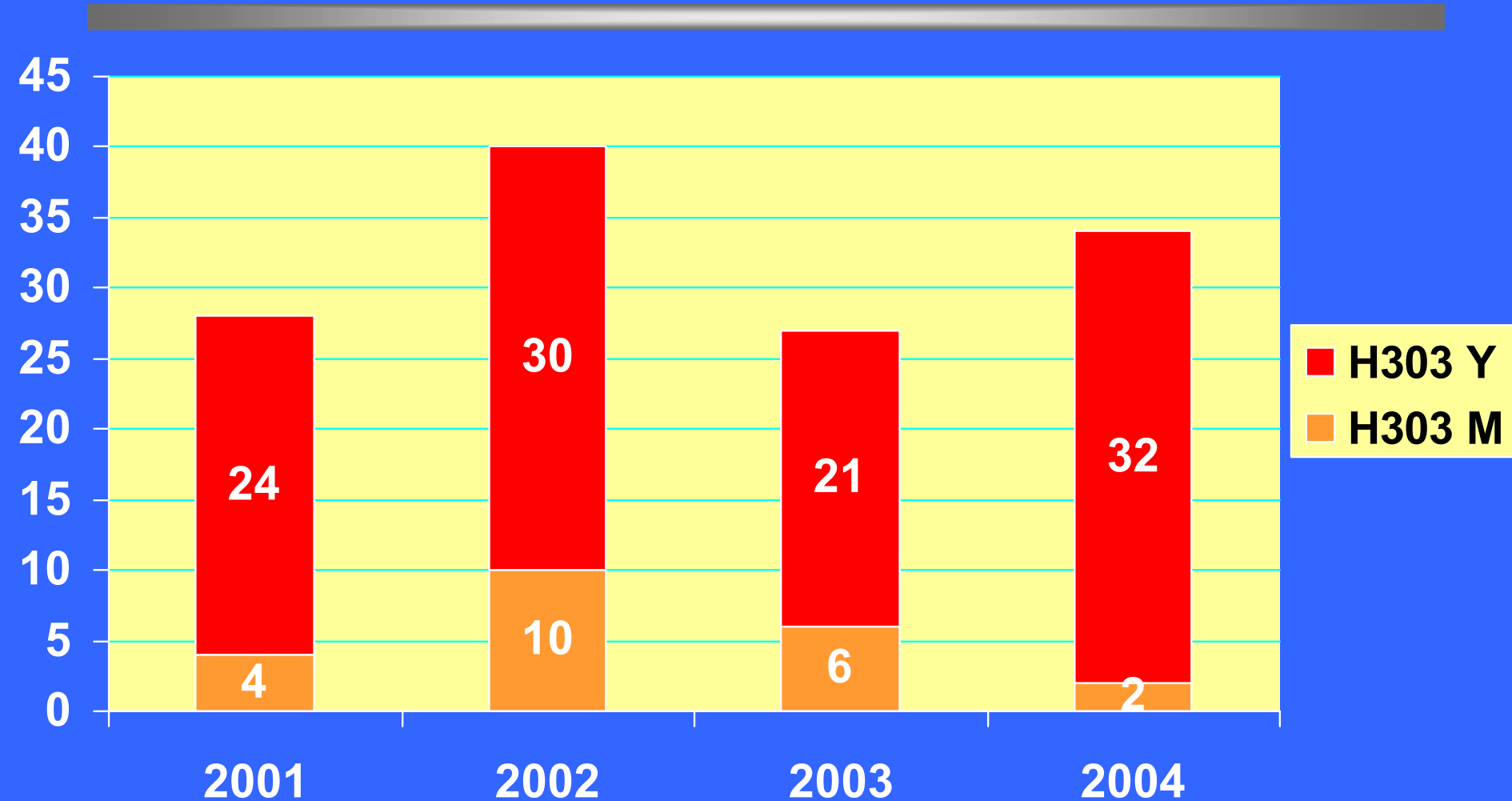
H302 / H301

Cars Left Foul

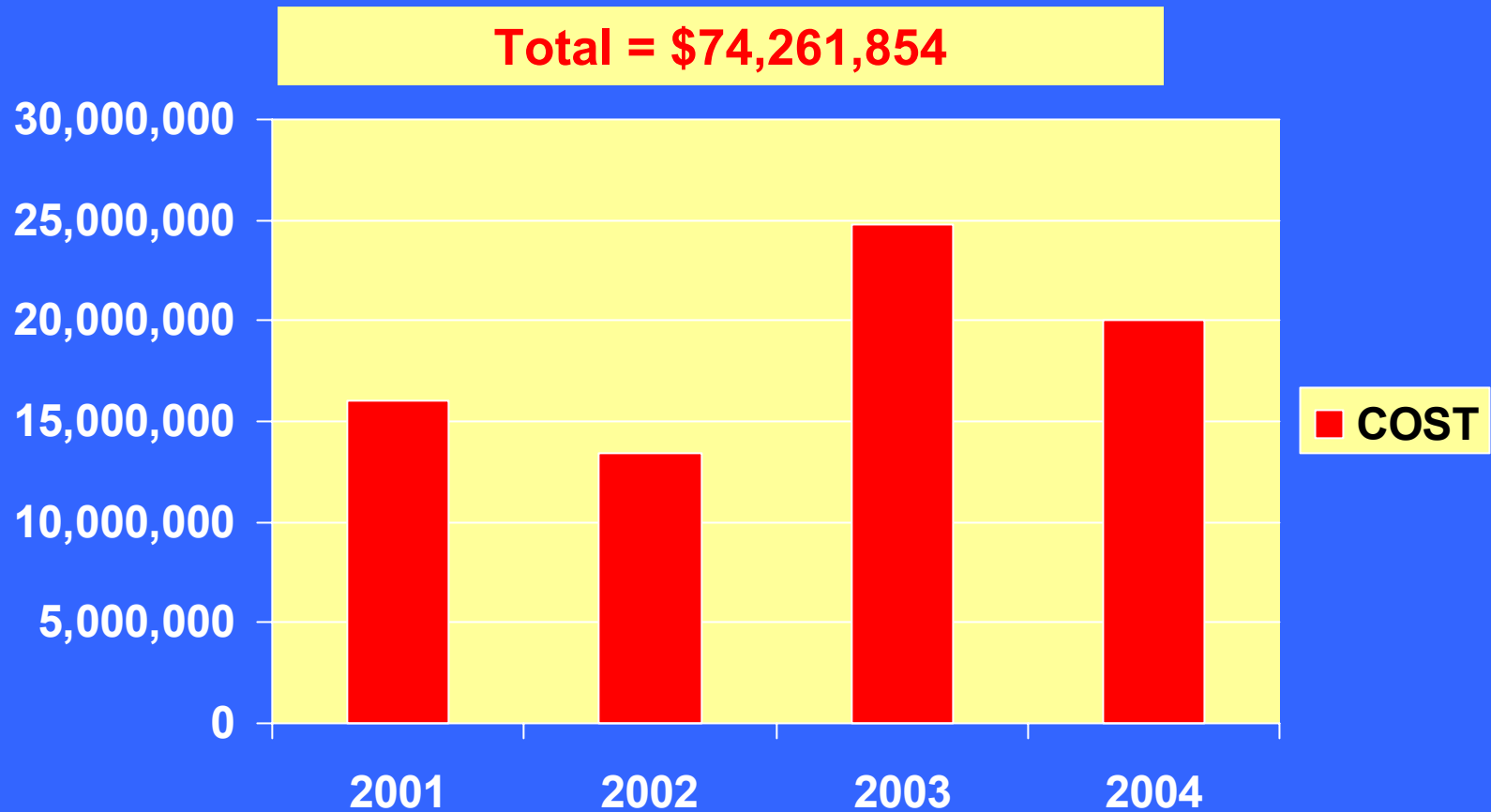


H303

Derail, Failure to Apply or Remove



Cost, HF Accidents, Class I Track 2001 – 2004



H702 Switch Improperly Lined

H704 Switch Previously Run Through

H703 Switch Not Latched or Locked

H306 Shoving Movement, Absence of Man

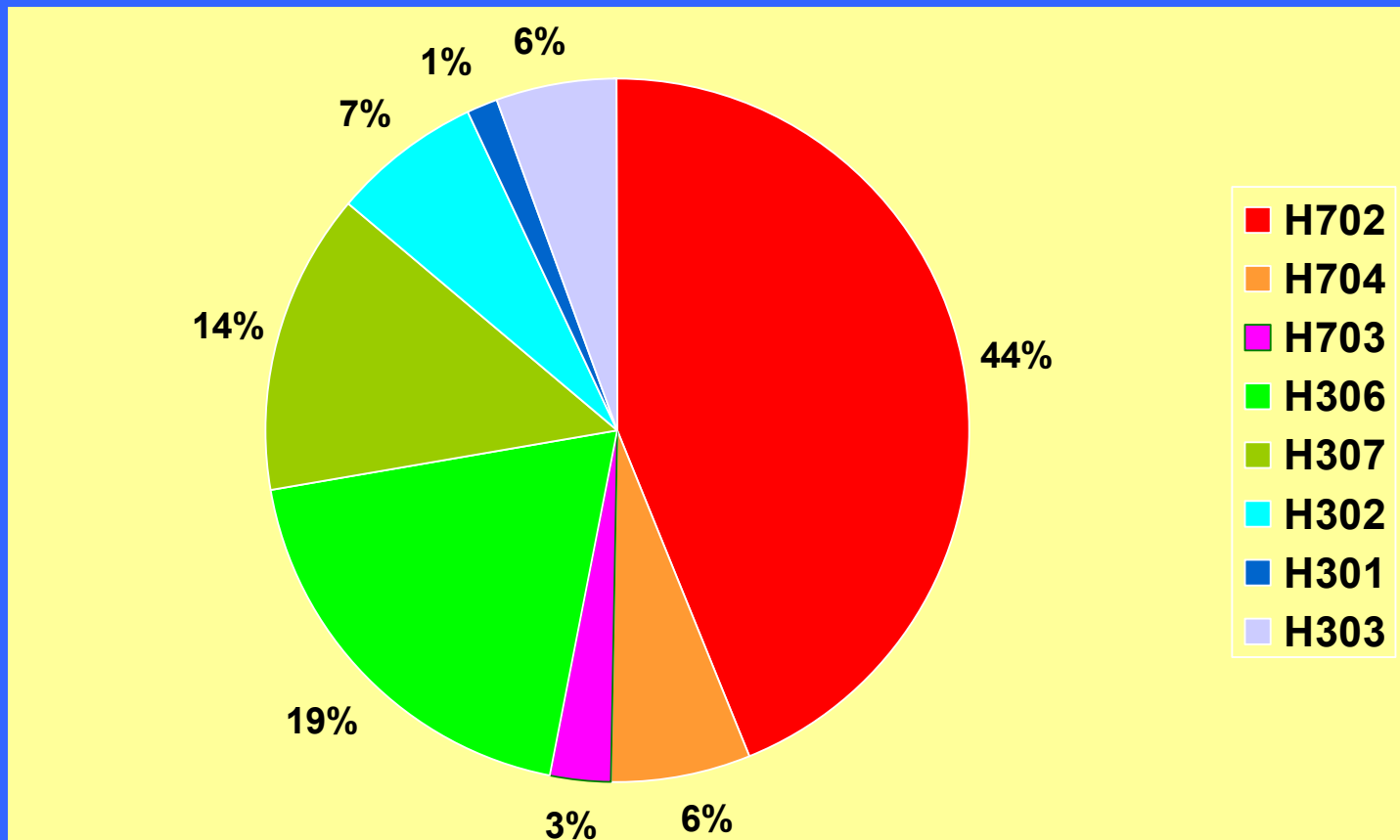
H307 Shoving Movement, Failure to Control

H302 Cars Left Foul

H301 Cars Shoved Out & Left Out of Clear

H303 Derail, Failure to Apply or Remove

2001 – 2004: Percent of Cost by Cause Code, Total = \$74,261,854



H702 Switch Improperly Lined

H704 Switch Previously Run Through

H703 Switch Not Latched or Locked

H306 Shoving Movement, Absence of Man

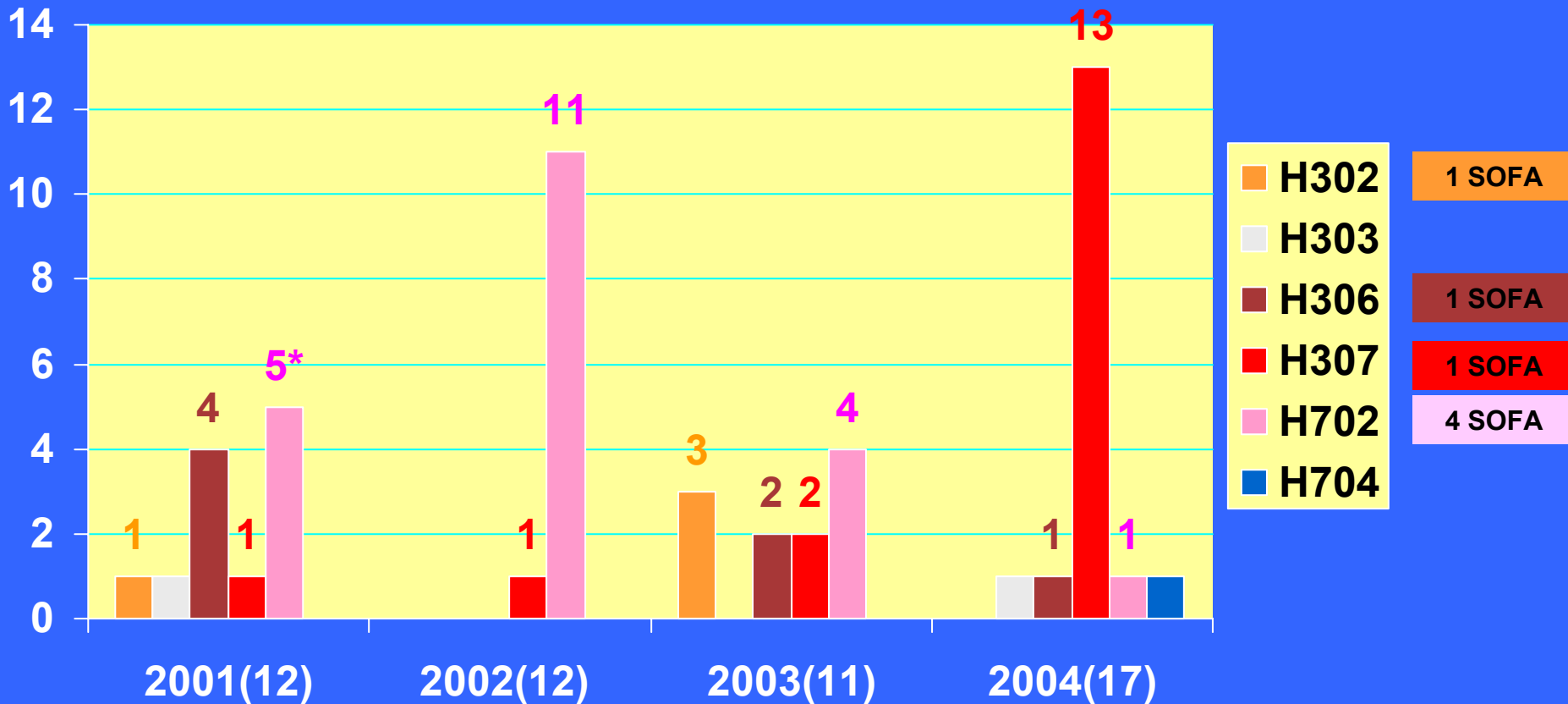
H307 Shoving Movement, Failure to Control

H302 Cars Left Foul

H301 Cars Shoved Out & Left Out of Clear

H303 Derail, Failure to Apply or Remove

HF Injuries, Class I Track



H702 Switch Improperly Lined * (and 1 Fatality)

H704 Switch Previously Run Through

H703 Switch Not Latched or Locked

H306 Shoving Movement, Absence of Man

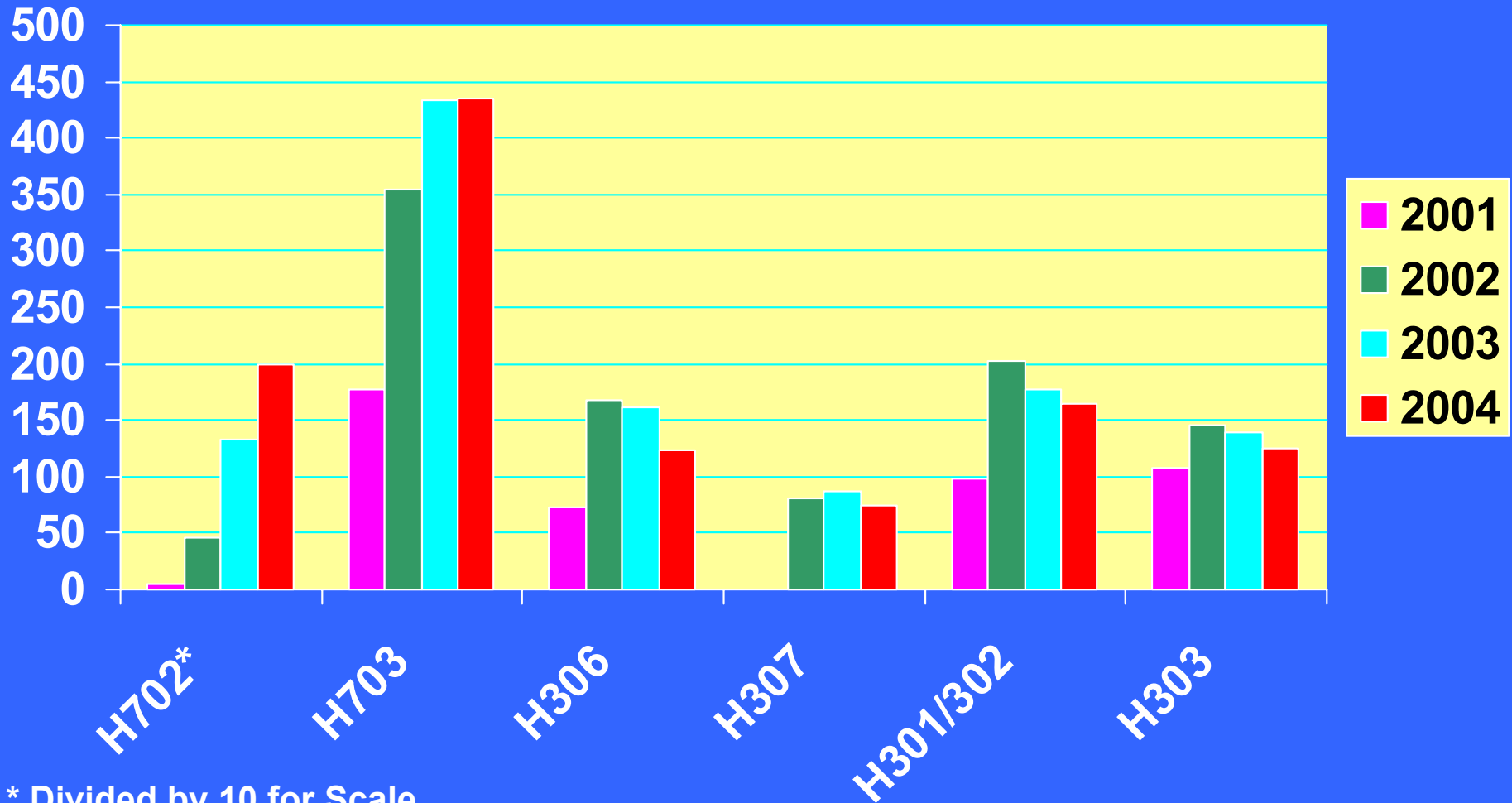
H307 Shoving Movement, Failure to Control

H302 Cars Left Foul

H301 Cars Shoved Out & Left Out of Clear

H303 Derail, Failure to Apply or Remove

Operating Practices; Inspection Defects by Cause Code



* Divided by 10 for Scale

H702 / 703 / 704 – Switches: ROR / RSR Defect Codes

Table of SUBRULE by YEAR4							
SUBRULE	YEAR4						Total
Frequency	2000	2001	2002	2003	2004	2005	
H702	Switch Improperly Lined						
H702	55	54	114	211	430	55	919
H705	0	0	95	297	298	76	766
H706	0	0	34	56	132	78	300
S331	0	0	221	762	1126	217	2326
H703	Switch Not Locked or Latched						
H703	81	177	305	357	356	100	1376
S334	0	0	11	28	32	13	84
S335	0	0	38	49	47	24	158
H704	Switch Previously Run Through						
	No Associated Subrule						

H-702 SWITCH IMPROPERLY LINED

H-702: ONE OR MORE EMPLOYEES FAILED TO ENSURE THAT ALL SWITCHES INVOLVED WITH A MOVE WERE PROPERLY LINED.

H-705: ONE OR MORE EMPLOYEES FAILED TO ENSURE ALL SWITCHES INVOLVED WITH THE MOVE WERE PROPERLY LINED BEFORE MOVEMENT WAS BEGUN.

H-706: ONE OR MORE EMPLOYEES FAILED TO ENSURE ALL SWITCHES INVOLVED WITH A MOVE WERE PROPERLY LINED AFTER BEING USED.

S-331: ONE OR MORE EMPLOYEES FAILED TO OBSERVE SWITCH POINTS FOR OBSTRUCTIONS BEFORE PROPERLY “THROWING” THE SWITCH

H-703 SWITCH NOT LATCHED OR LOCKED

H-703: ONE OR MORE EMPLOYEES FAILED TO ENSURE THAT SWITCH(ES) WERE LATCHED OR LOCKED PRIOR TO OR SUBSEQUENT TO, MOVEMENT OVER THE SWITCH OR SWITCHES.

S-334: ONE OR MORE EMPLOYEES FAILED TO REAPPLY THE HASP BEFORE MAKING A MOVE OVER THE REALIGNED SWITCH (WHERE APPLICABLE)

S-335: ONE OR MORE EMPLOYEES FAILED TO RELOCK SWITCH AFTER USE.

H306 / 307– Shoving Movements: ROR / RSR Defect Codes

Table of SUBRULE by YEAR4

SUBRULE	YEAR4						Total
Frequency	2000	2001	2002	2003	2004	2005	
H306	Shoving Movement, Absence of Man						
H306	50	72	167	162	102	22	575
H810	0	0	0	0	11	16	27
H811	0	0	0	0	11	6	17
H307	Shoving Movement, Failure to Control						
H603	4	0	24	13	12	2	55
H806	0	0	0	0	11	4	15
S226	0	0	56	74	51	12	193

H-306 SHOVING MOVEMENT, ABSENCE OF MAN ON OR AT LEADING END OF MOVEMENT

- H-306:** ONE OR MORE EMPLOYEES FAILED TO COMPLY WITH INSTRUCTIONS REGARDING SHOVING MOVEMENT, ACCOUNT LACK OF EMPLOYEE ON, AT OR AHEAD OF THE LEADING END OF MOVEMENT.
- H-810:** ONE OR MORE EMPLOYEES FAILED TO PROVIDE POINT PROTECTION AS REQUIRED-LOCOMOTIVE LEADING
- H-811:** ONE OR MORE EMPLOYEES FAILED TO PROVIDE POINT PROTECTION AS REQUIRED-CAR LEADING

H-307 SHOVING MOVEMENT, MAN ON OR AT LEADING END OF MOVEMENT, FAILURE TO CONTROL

- H-603:** ONE OR MORE EMPLOYEES FAILED TO CONTROL SPEED DURING SWITCHING MOVEMENT
- H-806:** ONE OR MORE EMPLOYEES OPERATED RCL WHILE OUT OF POSITION, I.E., MOVEMENT OUT OF OPERATOR'S RANGE OF VISION.
- S-226:** ONE OR MORE EMPLOYEES FAILED TO POSITION THEMSELVES SO THAT THEY COULD CONSTANTLY LOOK IN THE DIRECTION OF MOVEMENT.

H301 / 302 / 303 – Cars Left Foul & Derails: ROR Defect Codes

Table of SUBRULE by YEAR4

SUBRULE	YEAR4						Total
Frequency	2000	2001	2002	2003	2004	2005	
H301/302	Cars Left in the Foul						
H302	28	87	182	222	185	54	758
H401	18	11	21	38	39	7	134
H303	Derail, Failure to Apply or Remove						
H303	83	108	145	139	125	55	655

H-301/302 CAR(S) SHOVED OUT AND LEFT OUT OF CLEAR / CARS LEFT FOUL

H-302: ONE OR MORE EMPLOYEES FAILED TO ENSURE THAT EQUIPMENT WAS NOT FOULING ADJACENT TRACK BEFORE LEAVING SUCH EQUIPMENT. _

H401: ONE OR MORE EMPLOYEES FAILED TO ENSURE THAT TRAIN OR ENGINE WAS STOPPED IN THE CLEAR

H-303 DERAIL, FAILURE TO APPLY OR REMOVE

H303: ONE OR MORE EMPLOYEES FAILED TO COMPLY WITH INSTRUCTIONS REGARDING DERAIL OPERATIONS (ON-OFF)

Questions ???

