



Introduction to Results of Cross Industry Working Group on Freight Derailment (XIFDWG) bowtie risk assessment and priority study

Top 10 Controls for Further Study

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V0.3

Introduction

The roadmap and table below are an introduction to the results of the bowtie risk assessment and priority study. The Cross Industry Group on Freight Derailment (XIFDWG) has assessed the risks and their existing/potential controls on freight derailments due to combinations of track twist, wagon faults and offset loads.

The roadmap shows how certain studies are key enablers for others, and how the studies fit together.

The table shows the top 10¹ priorities for further study, for review by the XIFDWG, so that the group can consider for which controls it wishes to support detailed assessment and cost benefit analysis.

The next step is for the XIFDWG members to determine leaders and support for the studies, plus the sources of data necessary to undertake the detailed risk assessments and cost-benefit analysis for future implementation projects.

Two of the key enablers (nos 1 and 6) are being assessed as RSSB Research & Development projects, and work on nos 1 and 2 is being progressed between RSSB's strategic partnership with the University of Huddersfield and Network Rail.

The process is according to the filter diagram, below, in Figure 1. The filter diagram shows progress from a systematic understanding of current risk through assessment of the strength of current and potential control measures, to a transparent, methodical and traceable analysis of which are the most effective controls to strengthen management of the risk.

In parallel, the author of this introductory note will be drafting a full report for consideration by the group. However, it was felt important to share the need for key enablers to progress at this stage, in advance of the issue of this fuller report.

¹ In fact, 11 priorities as numbers 10 and 11 had equal scoring.

Figure 1: Bowtie and Priority Process - the Filter Diagram

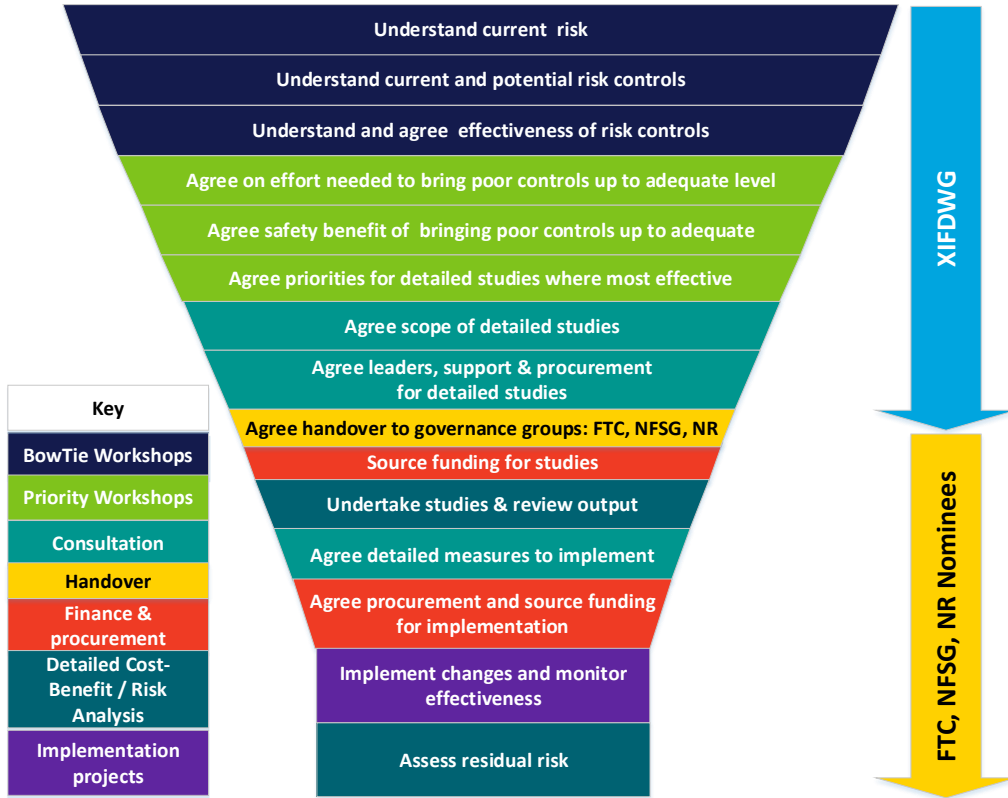


Figure 2: Roadmap showing Links between Top 10 Controls

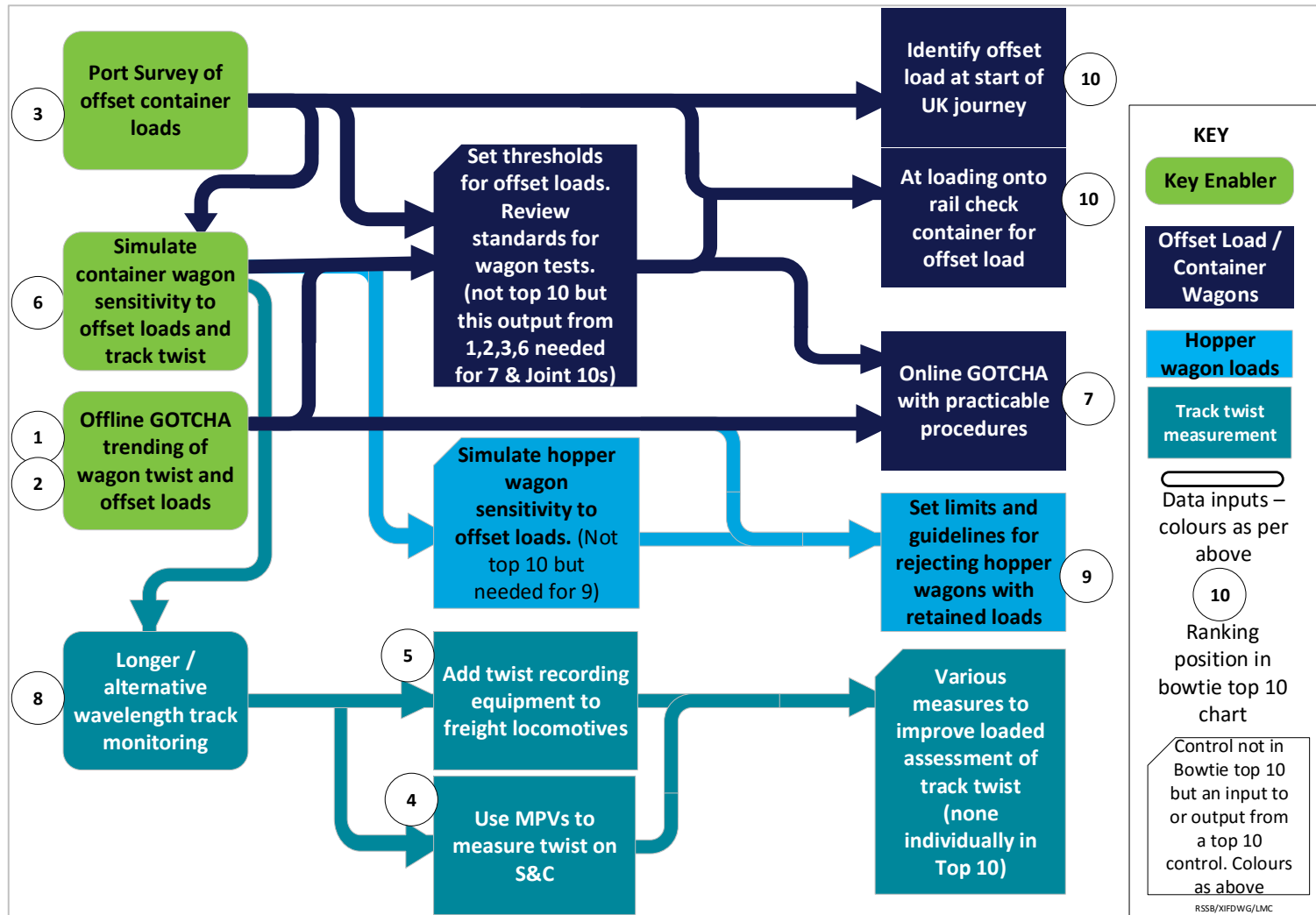


Table 1: Top 10 Priority Controls for Detailed Assessment

#	Control	Threat line	Effort scores					SB	FWI	Effort Σ	SB Σ	Scoring Ratio	Comments for further studies.
1	T5,6,7 Offline GOTCHA: check wagon twist	Tht. 5.						2	0.026	9.9	2.1	20.75	Key enabler Involves XI use of NR/FOC data for trending of offline results. Under discussion between NR/University of Huddersfield
		Tht. 6.	M	M	M	M	M	2	0.016				
		Tht. 7.						2	0.017				
2	Offline use of GOTCHA for problem loads	Tht. 8.						2	0.016	8.3	1.7	20.74	Key enabler Involves XI use of NR/FOC data for trending of offline results. Under discussion between NR/University of Huddersfield
		Tht. 9.						2	0.008				
		Tht. 10.	M	M	M	H	M	2	0.008				
		Tht. 12.						2	0.008				
		Tht. 13.						2	0.008				
3	Port survey for offset loads		L	M	L	M	H			6.1	1.2	19.36	Key enabler R&D project: initially assessing Bill Brassington's data. Then needs further research with port equipment and analysis. Specification written.
		Tht. 8.						1	0.016				
4	S&C use MPVs (T2)	Tht. 2.	H	M	H	H	M	2	0.056	11.3	2.0	17.75	Identified as a control to improve loaded measurement of track twist.
5	Add twist equipment to freight locos (T2)	Tht. 2.	H	H	H	M	M	2	0.056	14.1	2.0	14.21	Identified as a control to improve loaded measurement of track twist.
6	Simulate container wagon sensitivity to derailment with combinations of longitudinal & lateral offset load	Tht. 4.						2	0.005	4.5	0.5	10.35	Key enabler . Vampire modelling. Uses existing models to check wagon sensitivity against a range of offset loads. Potentially results in new thresholds for offset loads and wagon sensitivity tests Specification written.
		Tht. 9.	L	M	L	H	H	2	0.008				
7		Tht. 8.	H	H	H	M	M	2	0.016	14.1	1.5	10.32	

#	Control	Threat line	Effort scores					SB	FWI	Effort Σ	SB Σ	Scoring Ratio	Comments for further studies.
	Future Online use of GOTCHA for offset loads with practicable procedures	Tht. 12.						2	0.008			Use of GOTCHA online to alert IM/RUs to offset loads or wagon faults. Cost Benefit assessment would need to include additional infrastructure where failed wagons could be stabled without blocking lines.	
		Tht. 13.						2	0.008				
		Tht. 10.							2	0.008			
8	Longer /alt. wavelength monitoring (T2)	Tht. 2.	L	M	M	L	M					Existing project NR/University of Huddersfield to assess whether other track twist wavelengths other than the standard 3m are required. Requires input from sensitivity modelling of container wagons to be completed.	
9	Set limits and guidelines for rejecting wagons with retained loads - wagon dependent	Tht. 10.										Relates to incompletely unloaded hopper wagons, causing offset loads. Requires wagon sensitivity modelling and possibly offline GOTCHA results for assessment.	
		Tht. 10.	L	M	M	L	L						
		Tht. 10.											
10	T8 At loading onto rail check container for offset load	Tht. 8.	H	H	H	M	L					Joint no 10: Needs port survey data for assessment input of how this could be made practicable	
11	Identify offset loads at start of UK journey	Tht. 8.	H	H	H	M	L					Joint no 10: Needs port survey data for assessment input of how this could be made practicable	