

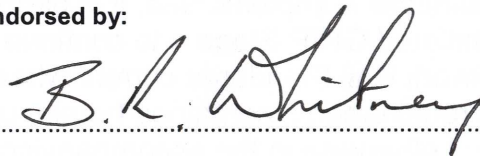
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Level 2

Management of Rail Testing using Train Based Sperry-Equipped Ultrasonic Test Unit (Sperry UTU)

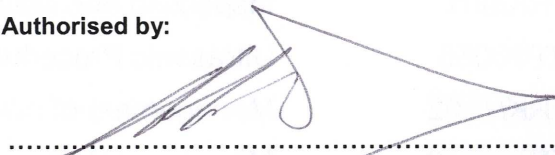
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Documents

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Issue record

Issue	Date	Comments
1	June	First issue of Level 2 documents which replaces Standard maintenance Procedure NR/PRC/MTC/TK0001

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 26th August 2008.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

NR/SP/TRK/001	Inspection and Maintenance of Permanent Way
NR/SP/TRK/055	Ultrasonic Procedures (formerly RT/CE/S/055)
NR/PRC/MTC/TK0069	Management of rail defects
NR/PRC/MTC/TK0084	Management of manual ultrasonic rail testing
NR/PRC/MTC/TK0127	Maintenance of track assets
NR/L2/STP/001	Management Process requirements
NR/L3/TRK/003/TEF3037	Report of Rail Defect Found
NR/L3/TRK/003/TEF3057	Daily Report of Ultrasonic Testing of UTU Suspect

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1 Purpose

This procedure defines the process for replacing compliant pedestrian ultrasonic testing with Sperry Equipped Ultrasonic Test Unit (Sperry UTU), covering the use of UTU2, UTU3 and UTU4.

2 Scope

This procedure applies to all track segments where Sperry UTU is to be used for routine ultrasonic testing using techniques U15 and U16 on full depth plain rail sections.

This procedure does not apply for ultrasonic testing of planed rail sections such as switches, crossings and adjustment switches or additional specified ultrasonic testing such as sizing of defects or testing of rolling contact fatigue.

3 Definitions

B-Scan	Ultrasonic imaging system utilised by Sperry to give a graphical representation of ultrasonic data for a section of track which is analysed to identify suspects.
Defect	A reportable ultrasonic rail defect, as per NR/SP/TRK/001, identified by pedestrian ultrasonic testing or on manual test of identified suspect.
Feature	Something in the track that gives an ultrasonic response; S&C switch, S&C crossing, Adjustment switch or bond holes, but is not a reportable defect.
Suspect	Ultrasonic response identified on analysis of B-Scan which could be a rail defect
Suspect List	Standard Report issued by Sperry following analysis of B-Scan detailing all suspects identified
Twin View	A Sperry process where B-Scan from the previous Sperry UTU run is compared to the latest run
VDMA	Vehicle Detected Measurement Analysis, the ultrasonic data portal used to record and display UTU and Pedestrian Test Results
Verification	Manual ultrasonic testing of a suspect using techniques described in NR/SP/TRK/055

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4 RACI

RACI DETAILS	KEY CONTROL ACTIVITY															
		AM Asset Management	EDS[U] Examination Data Specialist [Ultrasonics]	MSE[RM] Maintenance Support Engineer (Rail Management)	RME Rail Management Engineer	ADPM Area Delivery Planning Manager	TMPC Territory Maintenance Programme Co-Ordinator	ISM Infrastructure Services Manager	TTPC Timetable Planning Centres	PMSE[T] Principal maintenance Support Engineer [Track]	Sperry Sperry	TME Track Maintenance Engineer	TSM Track Section Manager	Signal Signalman	IFC Infrastructure Fault Control	IME Infrastructure Maintenance Engineer
Process Task																
7.1		A/R		C	C	I	C		I							
7.2		I				C	C		A/R							
7.3						A/R										
8.1					R						A					
8.2					R						A					
8.3		C		C	R						A					
8.4					R			C			A					
8.5		A/C	R	I	I					R						
8.5.4		A								R						
8.6					R						A					
8.6.1					R						A					
8.6.2					R			C			A					
8.6.3		I			R						A					
8.6.4					R						A/R					
8.6.5											R	C				A
8.7					R						A					
8.8					R						A					
8.9			I		R						A					
9.1					R						A					
9.2		As clause 8.3														
9.3		As clause 8.4														
9.4		As clause 8.5														
9.6				R						A						
9.7		C		C	C					A/R	C					
9.8										A/R						
9.9		I								A/R		I				
9.10.1		I			R							A				
9.10.2										A/R		I				
9.10.3												R				A
end RACI																

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5 Specification

5.1 Inspection Frequencies

Ultrasonic testing shall be carried out at intervals related to track category. Minimum inspection frequencies are shown in Table 1 together with maximum intervals between inspections.

Table 1 – Ultrasonic Testing Frequencies

Track Category	Pedestrian UT Inspection Interval (months) Plain Line	Pedestrian UT Inspection Plain Line Maximum Interval Between Inspections (months)	Pedestrian UT Interval (months) S&C, Tunnels, Joints etc.	Pedestrian UT Inspection S&C, Tunnels, Joints etc. Maximum Interval Between Inspections (months)	Interval (months) UTU	Maximum Interval UT Inspection (months) Plain Line UTU Compliant Routes
IA	3	3.5	2	2.5	2	2.5
1	6	7	3	3.5	2	3
2	12	13	6	7	4	6
3	24	26	12	13	6	8
4	24	26	12	13	6	8
5	24	26	12	13	6	8
6	24	26	24	26	12	18

NOTE: the maximum intervals shown above needs only be applied to the track category of segments not whole routes.

If a Sperry UTU compliant segment of track is not tested in accordance with the above maximum intervals, appropriate mitigation shall be considered. This may include reducing the line speed to the track category consistent with the testing interval resulting from the missed UTU run.

Sections of track not tested by Sperry UTU, including S&C and adjustment switches, shall continue to be tested in accordance with NR/SP/TRK/001. Manual testing is required to be undertaken to a distance 22 yards beyond either side of S&C to avoid the possibility of gaps between pedestrian and train based testing.

All suspects identified shall be verified in accordance with the timescales in Table 2, unless discounted by the Non-Actionable Repeat Marked Object (NARMO) Processes in paragraph 8.5.3.

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Table 2 – Verification Timescales

Suspect Category	Suspected Defect Type	Reported by Sperry	Verification Timescale				Mitigation Where not verified in specified timescale during compliant test
			Cat 1A, 1 & 2	Cat 3, 4, 5, & 6	Where suspect lies within pedestrian segment		
					Cat 1A, 1 & 2	Cat 3, 4, 5 & 6	
P1*	Any crack passing through a bolthole, or horizontal crack in head >15mm below running surface and/or >25mm long within fishplate limits	As soon as identified or no later than 4hrs after start of analysis shift	4hrs	24hrs	8hrs	36hrs	Impose 20mph ESR to cover ± 110 yards of reported mileage
P1	1A, 2A (36hr removal defects)	As soon as identified or no later than 8hrs after start of analysis shift	8hrs	24hrs	16hrs	36hrs	Impose 20mph ESR to cover ± 110 yards of reported mileage
P2	1B, 2B, 2C*, 3B (7 day removal defects)	Within 48hrs of start of analysis shift	7 days	14 days	14 days	28 days	Area Track Engineer (ATE) to advise
P3	3H, 2C, 3C, 2F, 3F, 3G (13 week removal defects)	Within 48hrs of start of analysis shift	14 days	28 days	28 days	56 days	ATE to advise
P4	Defects below reporting limits, provided for information only	Within 48hrs of start of analysis shift	For information only				
NARMO	Features where the ultrasonic signature remains unchanged	Within 48hrs of start of analysis shift	For information only				

NOTE : IFC shall log the suspect and advise the ARME or on-call delegated person of all P1* and P1 suspects reported by Sperry. Verification timescales apply from notification of Infrastructure Control (for P1 & P1* Suspects) or on issue of Sperry Testing Report.

5.2 Moving from Compliant Pedestrian Testing to Sperry UTU Compliance

All track segments shall be inspected in compliance with the requirements of NR/SP/TRK/001 Inspection and Maintenance of Permanent Way, until formally authorised for Sperry UTU compliance by the Principal Maintenance Support Engineer [Track], PMSE [T].

If the track segment is non-compliant with NR/SP/TRK/001 by pedestrian testing, the track segment cannot be included in the programme for Sperry UTU testing until compliance is achieved, this non-compliance should be progressed as specified in NR/L2/STP/001; Management Process requirements.

Sperry UTU shall be used to replace pedestrian testing on all track sections in category 1A to 3, except where this is considered to be impractical by PMSE [T].

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5.3 Ultrasonic Testing of Suspects

Ultrasonic Rail Flaw Detector Operators (URFDO) shall undertake manual testing in accordance with NR/SP/TRK/055, implement action as necessary in accordance with NR/SP/TRK/001, and report in accordance with NR/PRC/MTC/TK0084.

All suspects, including new suspects identified at known defects, as advised by the Rail Management Engineer (RME), shall be verified in accordance with the timescales specified in section 5.2.

URFDO shall undertake pedestrian testing for +/- 22 yards of the reported GPS co-ordinates of each suspect (Figure 1) or +/- 110 yards if GPS is not used to locate the suspect (Figure 2).

The URFDO shall mark the start position reported by Sperry including any +/- walk out distance reported. Walkout distances will be reported as positive in the direction of increasing mileage.

In addition to the 22 yards required to be verified in both directions, the GPS device inaccuracy should also be added onto either side of the verification length as below. Figure 1 uses a typical inaccuracy reading of 7 and 10 yards (for demonstration purposes only) from the hand held GPS device. This revised overall length should then be tested and any actionable defects or features reported against their individual GPS location including hand held GPS inaccuracy.

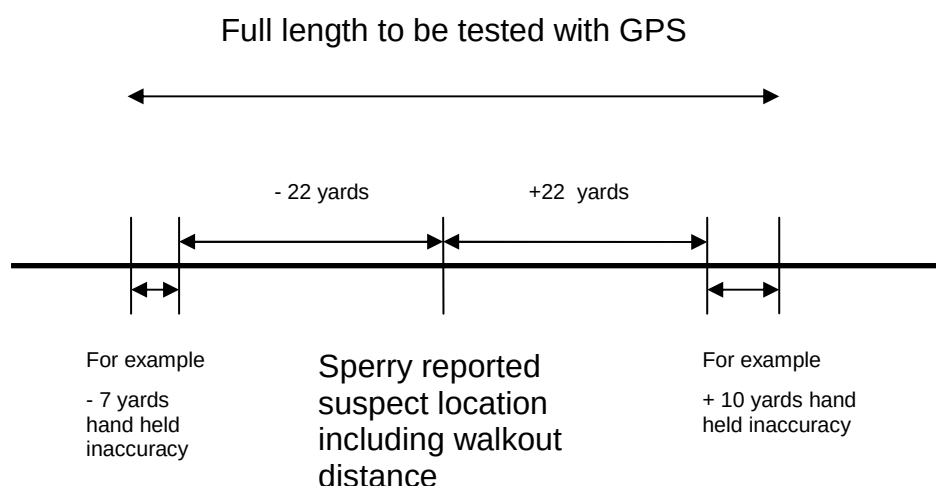


Figure 1 ~ Track to be tested (GPS)

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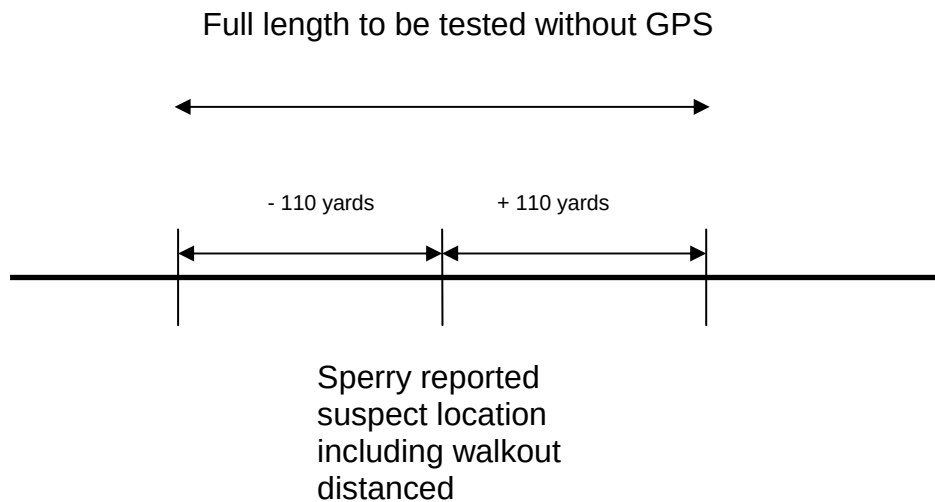


Figure 2 – Track to be tested (Non GPS)

The full length (including hand held inaccuracies) shall be tested as shown above.

GPS receivers shall be set up to use GPS co-ordinates in DDDMM.MMMM format (degrees, minutes, and decimal minutes) and use grid referencing system WGS84. Those URFDOs working in the Eastern part of the country need to confirm east & west are correctly recorded around the Greenwich Meridian (0° E & W).

e.g. Latitude: DDDMM.MMMM (N)

Longitude: DDDMM.MMMM (E/W)

URFDO shall complete TEF/3057, Report of Ultrasonic Testing of UTU Suspect for each suspect, identifying and recording all defects & features within the walkout distance and submit the form to the Ultrasonic Supervisor (US) at the end of the shift.

Where a defect (or defects) is identified, the URFDO shall complete a Form B (TEF/3037 Report of Rail Defect Found in the Track), for each defect found, and submit in accordance with NR/PRC/MTC/TK0069.

Defects to be managed in accordance with NR/SP/TRK001 and manual ultrasonic testing shall be carried out in accordance with NR/SP/TRK/055 and NR/PRC/MTC/TK0084.