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6 September 2021

Mr Andrew Hall  
Deputy Chief Inspector of Rail Accidents  
Cullen House  
Berkshire Copse Rd  
Aldershot  
Hampshire GU11 2HP

Dear Andrew,

**RAIB Report: Passengers struck by a flying cable at Abergavenny (Y Fenni) station on 28 July 2017**

I write to provide an update<sup>1</sup> on the action taken in respect of recommendations 2 & 3 addressed to ORR in the above report, published on 9 May 2018.

The annex to this letter provides details of actions taken in response to the recommendations and the status decided by ORR. The status of recommendations 2 & 3 is '**Implemented**'.

We do not propose to take any further action in respect of the recommendations, unless we become aware that any of the information provided has become inaccurate, in which case I will write to you again.

We will publish this response on the ORR website on 7 September 2021.

Yours sincerely,



Oliver Stewart

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<sup>1</sup> In accordance with Regulation 12(2)(b) of the Railways (Accident Investigation and Reporting) Regulations 2005

## Recommendation 2

*The intent of this recommendation is to reduce the risk from cables hanging down from overline structures around stations, snagging on passing trains and causing injury to the public and staff.*

Network Rail should, in consultation with station operators, document and publish controls for the management of cables that cross operational railway lines via overline structures at stations. These controls should cover installation, inspection and testing of the cables, and include details of:

- a. approved methods for supporting interior and exterior cables, taking into account environmental effects on fixings; and
- b. determining, based on risk, appropriate inspection and testing periodicities for cables and their fixings

### ORR decision

1. To address part a of the recommendation, Network Rail has updated the Cross-Track Cable Management standard (NR/L2/SIG/19812), which now includes a clause covering approved methods for attaching cables to structure crossing rail lines. The specification applies to all cross-track cables regardless of cable asset owner, including cables that may be managed by Station Infrastructure Managers or third parties that are required to cross Network Rail tracks.

2. Part b of the recommendation was addressed by the publication of a revised standard for Structures, Tunnels and Operational Property Examinations (NR/L3/CIV/006) which include requirements for a person examining a structure to record cable or cable containment system defects and report them to the Operational Property Helpdesk.

3. These two initiatives should improve management of cables crossing the railway and reduce the risk of them sagging and being snagged by passing trains.

4. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

- taken the recommendation into consideration; and
- has taken action to implement it

**Status: Implemented.**

### Previously reported to RAIB

5. On 8 April 2019 ORR reported the following:

We are content with the proposed actions identified by Network Rail to improve cable management, but asked why the work is expected to take until March 2021. We questioned if it would be possible to bring the completion date forward, by delivering the requirements of the recommendation by a method other than a change to a standard.

In response, Network Rail stated that the revision of NR/SP/SIG/19812 will have significant scope and requires the involvement of five Professional Heads, hence the long timescale. However, Network Rail may be able to put in place a variation to the standard which may potentially enable the recommendation to be closed more quickly.

## Update

6. On 20 April 2021 Network Rail provided the following closure statement:



[N186-05] Closure  
Statement RAIB Rec

7. Network Rail state the following:

*Recommendation 2 states that: “Network Rail should, in consultation with station operators, document and publish controls for the management of cables that cross operational railway lines via overline structures at stations. These controls should cover installation, inspection, and testing of the cables, and include details of:*

- a. Approved methods for supporting interior and exterior cables, taking into account environmental effects on fixings; and*
- b. Determining, based on risk, appropriate inspection and testing periodicities for cables and their fixings.”*

*The intent of Recommendation 2 is to reduce the risk from cables hanging down from overline structures around stations, snagging on passing trains and causing injury to the public and staff.*

*In response to this recommendation, Network Rail published Emergency Change NR/BS/LI/424 (publication date: 18/04/2019 – compliance date: 06//05/2019), led by Chris Talbot, to implement controls on the retrospective fixing of cabling to overline structures. The requirements for fixing new cabling to structures set out in the Emergency Change took into account cable containment systems capacity, condition, and material specification (new sub-clause 6.4). Cable containment fixing location requirements were specified with the definition of Non-preferred zones for fixing cables (figure 1). A preference hierarchy for fixing proposed cable containment systems in the non-preferred zones was specified, subject to approval by the Route Asset Manager responsible for the asset, and after consultation with a gauging engineer.*

*Subsequently, the Cross-Track Cable Management standard NR/L2/SIG/19812 was updated to incorporate and build on the requirements specified in the Emergency Change. The revision of the Cross-track cable management standard was led by Anastasios Papapanagiotou [Senior Engineer, B&A], approved by Jeremy Morling [Network Technical Head Signalling] and published on 05/12/2020 with a compliance date of 06/03/2021. Clause 9.5 was introduced which specified approved methods for supporting cables to over-track crossings (defined as over-track structures spanning the tracks and carrying cables or cable containment systems). Indicative supporting evidence of the changes can be seen in standard excerpts below.*

**9.5 Over-Track crossings**

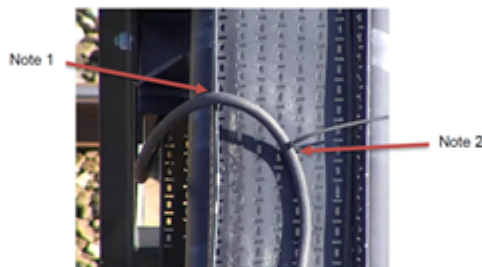
For over-track crossings, new cabling shall not be attached to:

- a) an existing cable tray or containment systems where the cable containment is at full capacity (i.e. where space allocated for cabling is occupied and no more capacity is available), regardless of location of the cable tray and location of cabling on the tray;
- b) an existing cable tray or containment system that has been determined to be in poor condition through evaluation of survey data and agreement with the Route Asset Manager for the structure or their delegate;
- c) existing cables;
- d) a cable tray or containment system using cable ties or fixings that are susceptible to degradation from heat, moisture and ultraviolet radiation within the design life of the cable system.

Cable trays shall be installed in accordance with the manufacturer's instructions.

Transitions between different elements of a cable tray (for example from the horizontal to a vertical plane) shall be designed to support the cable throughout the transition at not less than the minimum cable bend radius.

**Appendix E - Indicative photos of cable containment in over track crossings (OTX)**



**NOTE 1:** Poor practice - Cable leaving tray is not properly supported or retained  
**NOTE 2:** Poor practice - Plastic zip ties used - not resistant to UV light

**Figure 11 – Open cable tray in the horizontal plane showing poorly fixed cable**

Where there is a need for a cable to be run out of an open cable tray, a T-piece shall be used to reduce the risk of the cable falling off the tray in the event of fastenings failure.

The expansion and contraction of cables and cable trays shall be part of the OTX design and suitable provisions made.

**NOTE:** Indicative photos of good and poor practice can be found in appendix E.

Written permission from the relevant RAM for the structural asset affected shall be obtained prior to installing any cable to existing overline structures and the gauging engineer.

Cables shall not be attached or fixed to the non-preferred zones shown in Appendix A unless prior written permission has been obtained from the structure's Route Asset Manager and the gauging engineer.

In order to avoid potentially abortive works, consideration should be given to future requirements of the route, for example if the structure that the cable route is to be fixed to is (list not exhaustive):

- ageing or life expired;
- planned for removal or replacement or;
- planned to be lifted for electrification or route gauge enhancements.

If approval has been obtained to install cable containment systems within the non-preferred zones, the following hierarchy shall be applied when selecting the type and location of the cable containment system:

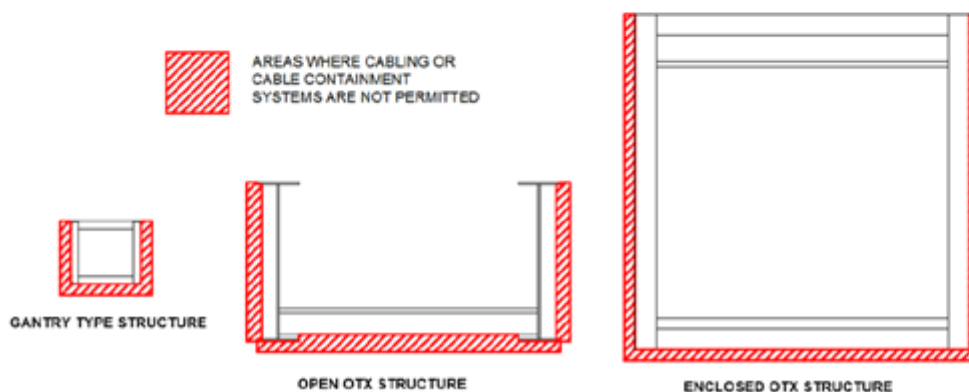
1. lidded cable containment system in the horizontal plane;
2. un-lidded cable containment system in the horizontal plane;
3. open cable containment system in the horizontal plane with ultraviolet resistant components;
4. open cable containment system in the vertical plane with ultraviolet resistant components.

Design of cable containment and cable fixing systems should aim to minimise whole life cost.

The containment system of new cabling located within publicly accessible areas shall be designed to mitigate the risk of vandalism or theft, but allow inspection and maintenance of the cabling, connections and structural elements.

The requirements of this clause shall apply for both permanent and temporary works (i.e. major enhancements and renewals, minor enhancements and renewals, and maintenance works).

**Appendix A - Prohibited cable fixing diagram**



**Figure 2 - OTX Prohibited cable fixing diagram**

*Part b of the recommendation was addressed by the publication of NR/L3/CIV/006 - Structures, Tunnels and Operational Property Examinations, in particular modules 3C – Examination of Operational Property Structures and Fabric - Visual Examinations, and 3D - Examination of Operational Property Structures and Fabric – Pre-detailed Inspection and Detailed Examinations. Clause 13.2 in the former and 11.2 in the latter include requirements for the Examiner to record cable or cable containment system defects and report them to the Operational Property Helpdesk as necessary. Indicative supporting evidence of the changes can be seen in standard excerpts below.*

### 13 Asset type requirements

#### 13.1 General

The Visual Examination of an asset shall measure and record incomplete asset data as required by Network Rail's Fabric and Mechanical and Electrical Measurement Rules.

**NOTE:** Refer to Forms NRL3/CIV/006/F3A2 and NRL3/CIV/006/F3A3.

#### 13.2 Cable management systems

The Visual Examination shall identify and record the presence of cable management systems fixed to an external face of an asset.

Examiner shall record the following:

- a) cable containment system housing too many cables;
- b) primary mechanical or chemical fixings used to affix the containment to the substrate, identifying any evidence of fixings 'pulling-out' of substrate;
- c) where a cable containment fixing is fixed in a hollow or damp / wet substrate;
- d) plastic cable ties used to fix cables to a containment system.

If items b) and/or c) are observed the Examiner shall report the defect to the OPHD.

### 11 Asset type requirements

#### 11.1 General

The Detailed Examination of an asset shall measure and record incomplete asset data as required by Network Rail's Fabric and Mechanical and Electrical Measurement Rules.

**NOTE:** Refer to Forms NRL3/CIV/006/F3A2 and NRL3/CIV/006/F3A3.

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- c) where a cable containment fixing is fixed in a hollow or damp / wet substrate;
- d) plastic cable ties used to fix cables to a containment system.

If items b) and/or c) are observed the Examiner shall report the defect to the OPHD.

*The above changes address both the recommendation requirements and the recommendation's intent.*

### Recommendation 3

*The intent of this recommendation is to reduce the risk of cable inspections being missed due to lack of clarity about who is responsible for those inspections.*

Network Rail, in conjunction with station operators, should at every station:

- a. continue to completion its work to identify cables that cross above the operational railway at stations via overline structures and have the potential to droop and be snagged by a train; and
- b. ensure that the organisation responsible for the ongoing testing and inspection of those cables identified in part (a), and any installed in the future, is clearly and correctly documented.

### ORR decision

8. Network Rail has carried out a programme of work to identify cables that cross over the operational railway. The changes to standards made by Network Rail to address part b of the recommendation indicate they are taking responsibility in all cases for inspection of all such cables in future.

9. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

- taken the recommendation into consideration; and
- has taken action to implement it

**Status: Implemented.**

### Previously reported to RAIB

10. On 8 April 2019 ORR reported the following:

We are content with the work Network Rail is doing with station operators to reduce the risk of cable inspections being missed, but as with recommendation 2 questioned why the work is expected to take until March 2021. In addition, we asked Network Rail to explain how the review of cabling affixed to structures (Rafts, Services Bridges, Gantries) identified as part of the CEFA examinations regime is being managed and to also provide an update on the revision of Standard NR/L3/CIV/006 Handbook for the Examination of Structures.

In response Network Rail stated that the revision NR/L3/CIV/006 may now be published much sooner, which again could potentially facilitate an earlier closure of the recommendation.

### Update

11. On 20 April 2021 Network Rail provided the following closure statement:



[N186-05] Closure  
Statement RAIB Rec

12. Network Rail state the following:

*Recommendation 3 states that: "Network Rail in conjunction with station operators, should at every station:*

- a. Continue to completion its work to identify cables that cross above the operational railway at stations via overline structures and have the potential to droop and be snagged by a train; and*
- b. Ensure that the organisation responsible for the ongoing testing and inspection of those cables identified in part (a), and any installed in the future, is clearly and correctly documented."*

*The intent of Recommendation 3 is to reduce the risk of cable inspections being missed due to lack of clarity about who is responsible for those inspections.*

In response to this recommendation, Network Rail carried out a review of structures in or near a station environment and examined structures data and inspection records to identify cables that cross above the operational railway. This review was led by Anastasios Papapanagiotou [Senior Engineer, B&C] on behalf of Buildings, and Chris Talbot [Principal Engineer, B&C] on behalf of Structures, and it was supported by the collaborative effort of asset engineers and senior asset engineers in the Routes and Regions. This review was completed successfully on 29/03/2021 and lists of structures on a regional level were compiled. Indicative supporting evidence of the list can be seen in excerpts below.

A	D	E	F	G
ELR	Railway_ID	Description	CABLES present on the outside face of the Footbridge	Asset_Group
DVR1	44	BARNBURGH LANE FOOTBRIDGE	Not Present	Bridge
BGE	1	BGE/1 BOLDON COLLIERY FB	Not Present	Bridge
CFM	2A	ROSE LANE FOOTBRIDGE.	Present	Bridge
DOL1	22A	SOUTH ELMSALL FOOTBRIDGE	Not Present	Bridge
DOL1	40	RAILWAY TERRACE, NEAR FITZWILLIAM STN	Not Present	Bridge
DOL2	55AA	River Aire Footbridge	Not Present	Bridge
DOW	41	ROWLAND RD F/BRIDGE (SCUNTHORPE WEST YD)	Not Present	Bridge
DSN3	63D	RED LION ST / FRANCE ST TO SCOTT ST	Not Present	Bridge
ECM1	38	ECM1/38	Not Present	Bridge
ECM1	40	ECM1/40	Not Present	Bridge
ECM1	59	ECM1/59	Not Present	Bridge
ECM1	99A	ECM1/99A	Not Present	Bridge

A	B	
Train Shed Site Name	Area	Comments
Charing Cross	Kent	No Cables fitted to underside of raft.
London bridge	Kent	No Cables fitted to underside of raft.
Blackfriars Stn	Sussex	No Cables fitted to underside of raft.
Brighton Stn	Sussex	No Cables fitted to underside of raft.
Crystal Palace Stn	Sussex	No Cables fitted to underside of raft.
London Victoria Stn	Sussex	No Cables fitted to underside of raft.
City Thameslink Stn	Sussex	No Cables fitted to underside of raft.
Undercroft Site Name	Area	Comments
Bickley Stn	Kent	Lightning conduits are perpendicular to track above tracks. D
Blackheath Stn	Kent	Lightning conduits are perpendicular to track above, no risk.
Bromley South	Kent	Lightning conduits are perpendicular to track above, no risk.
Chatham Stn	Kent	Lightning conduits are perpendicular to track above, no risk.
Clock House Stn	Kent	Lightning conduits are perpendicular to track above.Desktop
Gillingham	Kent	No Cables fitted to underside of raft.
Grove Park	Kent	No Cables fitted to underside of raft.
Sevenoaks	Kent	No Cables fitted to underside of raft.
St mary Cray	Kent	Lightning conduits are perpendicular to track above, no risk.
Woolwich Arsenal	Kent	No Cables fitted to underside of raft.
Charing Cross	Kent	No Cables fitted to underside of raft.
Banstead Stn	Sussex	No Cables fitted to underside of raft.
Bexhill Stn	Sussex	Lightning conduits are perpendicular to track above the plat
Burgess Hill Stn	Sussex	No Cables fitted to underside of raft.
Crystal Palace Stn	Sussex	No Cables fitted to underside of raft.

Part b of the recommendation is addressed by:

- the publication of NR/L2/CIV/250 – Landlords Consent standard (for cables/cable containment systems installed in the future),
- and the update of NR/L3/CIV/006 - Structures, Tunnels and Operational Property Examinations, in particular modules 3C – Examination of Operational Property Structures and Fabric - Visual Examinations, and 3D - Examination of Operational Property Structures and Fabric – Pre-detailed

*Inspection and Detailed Examinations (for existing cables/cable containment systems).*

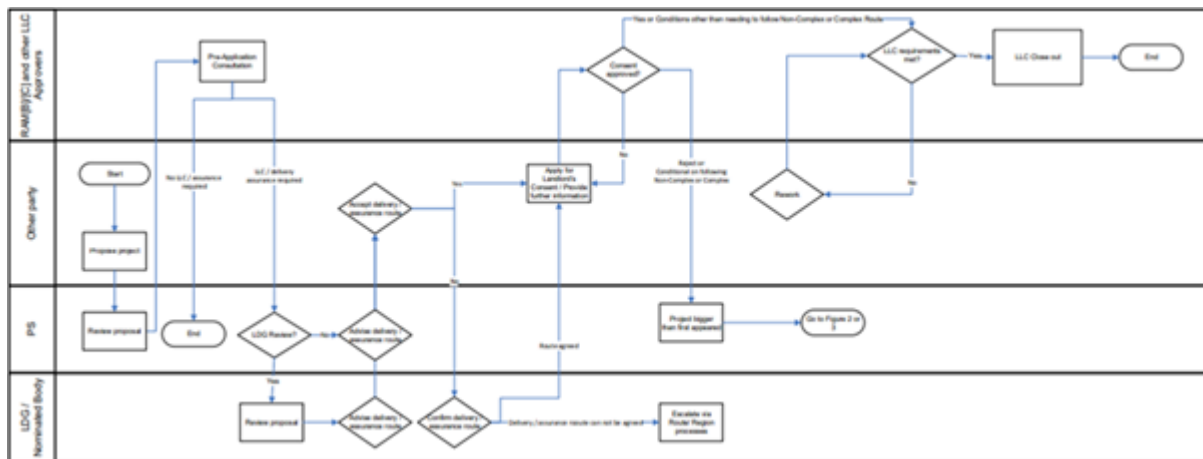
The Landlords Consent standard was published on 07/03/2020, had a compliance date of 05/12/2020 and its development was led by Andrew Jannaway [Principal Engineer, B&C]. Its purpose is to confirm Network Rail are maintaining and protecting the safety of the railway by ensuring that all necessary Network Rail departments have consented for the works to go ahead. It sets out the procedure for identifying where Landlord's Consent is required to allow alterations and work to be undertaken at premises Network Rail rent out to Train Operating Company tenants for England, Scotland and Wales. It achieves the above by providing a detailed RACI chart (table 1), clear definitions (tables 2 and 3) and flowcharts to be followed depending on the complexity and approvals needed for a proposed project (figures 1, 2, and 3). An additional question was also added to the Landlords Consent application process to specifically check if any new cables are being added to a cross track structure in the station. Indicative supporting evidence can be seen in standard excerpts below.

### 3 Roles and Responsibilities

The responsible, accountable, consulted and informed (RACI) roles for this business processes shown in Section 5 are listed in Table 1.

R – Responsible is the person or people who are responsible for performing a certain task or action. A – An Accountable person is one who has overall accountability to make sure that a task or action is completed. C – Consulted people have an input into the task or action, this can be providing information, reviewing documents or attending workshops etc. I – Informed people are those who receive the output of a task or process. * Denotes option for delegation	Route Asset Manager [Civils] (RAM[B/C]) and other LLC Approvers	Tenant	Portfolio Surveyor (PS) / person responsible for Commercial Property Surveying	LDG / Nominated Body Chair	Route Enhancement Manager (REM) / or Person responsible for Route / Region enhancement works	Sponsor	Head of Asset Protection HAP
Propose Project		A,R	I				
LDG Review	C	I	A,R		C	C	C
Review Proposal	C	I	C	R	C	C	I
Advise Assurance Route	I	I	A,R		I	I	I
Apply for LLC	I	A,R	I	I	I	I	I





The Structures, Tunnels, and Operational Property Examinations standard was published on 07/09/2019, has a compliance date of 01/04/2021 and its development was led by Colin Hall [Senior Engineer, B&C]

Clause 13.2 in the former and 11.2 in the latter include requirements for the Examiner to record cable or cable containment system defects and report them to the Operational Property Helpdesk as necessary. Indicative supporting evidence of the changes can be seen in standard excerpts below.

### 13 Asset type requirements

#### 13.1 General

The Visual Examination of an asset shall measure and record incomplete asset data as required by Network Rail's Fabric and Mechanical and Electrical Measurement Rules.

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- where a cable containment fixing is fixed in a hollow or damp / wet substrate;
- plastic cable ties used to fix cables to a containment system.

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- plastic cable ties used to fix cables to a containment system.

If items b) and/or c) are observed the Examiner shall report the defect to the OPHD.

*The above actions address both the recommendation requirements and the recommendation's intent.*

## Previously reported to RAIB

### Recommendation 2

*The intent of this recommendation is to reduce the risk from cables hanging down from overline structures around stations, snagging on passing trains and causing injury to the public and staff.*

Network Rail should, in consultation with station operators, document and publish controls for the management of cables that cross operational railway lines via overline structures at stations. These controls should cover installation, inspection and testing of the cables, and include details of:

- a. approved methods for supporting interior and exterior cables, taking into account environmental effects on fixings; and
- b. determining, based on risk, appropriate inspection and testing periodicities for cables and their fixings

### ORR decision

1. We are content with the proposed actions identified by Network Rail to improve cable management, but asked why the work is expected to take until March 2021. We questioned if it would be possible to bring the completion date forward, by delivering the requirements of the recommendation by a method other than a change to a standard.

2. In response, Network Rail stated that the revision of NR/SP/SIG/19812 will have significant scope and requires the involvement of five Professional Heads, hence the long timescale. However, Network Rail may be able to put in place a variation to the standard which may potentially enable the recommendation to be closed more quickly.

3. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

- taken the recommendation into consideration; and
- is taking action to implement it by March 2021.

**Status: Implementation ongoing. ORR will advise RAIB when actions to address this recommendation have been completed.**

### Information in support of ORR decision

4. 8 November 2018 provided the following initial response:

*Network Rail will document and publish controls on the management of cables within the revision of Standard NR/SP/SIG/19812: Cross Track Cable Management.*

*Approved methods for installation, supporting interior and exterior cables, taking into account environmental effects on fixings*

1. *Network Rail will confirm this is included in the new Standard designs for Footbridges, which are currently being developed*

2. *We have reviewed the Standard: NR/SP/SIG/19812: Cross Track Cable Management and will commence with an initiative to enhance this to include over line cable management*
3. *We will add a new question to the Landlords Consent process which controls Consent of Train Operating Companies undertaking work at Stations.*

*Inspection and testing of the cables, and include details of: determining, based on risk, appropriate inspection and testing periodicities for cables and their fixings*

1. *We have considered this and concluded that we will not progress a risk based approach, instead will undertake Annual Visual and Detailed Inspections that will be governed by a revision of the Standard NR/L3/CIV/006 Handbook for the Examination of Structures*

*Timescale: March 2021*

### **Recommendation 3**

*The intent of this recommendation is to reduce the risk of cable inspections being missed due to lack of clarity about who is responsible for those inspections.*

Network Rail, in conjunction with station operators, should at every station:

- a. continue to completion its work to identify cables that cross above the operational railway at stations via overline structures and have the potential to droop and be snagged by a train; and
- b. ensure that the organisation responsible for the ongoing testing and inspection of those cables identified in part (a), and any installed in the future, is clearly and correctly documented.

### **ORR decision**

5. We are content with the work Network Rail is doing with station operators to reduce the risk of cable inspections being missed, but as with recommendation 2 questioned why the work is expected to take until March 2021. In addition, we asked Network Rail to explain how the review of cabling affixed to structures (Rafts, Services Bridges, Gentries) identified as part of the CEFA examinations regime is being managed and to also provide an update on the revision of Standard NR/L3/CIV/006 Handbook for the Examination of Structures.

6. In response Network Rail stated that the revision NR/L3/CIV/006 may now be published much sooner, which again could potentially facilitate an earlier closure of the recommendation.

7. After reviewing the information provided ORR has concluded that, in accordance with the Railways (Accident Investigation and Reporting) Regulations 2005, Network Rail has:

- taken the recommendation into consideration; and
- is taking action to implement it by March 2021.

**Status: Implementation ongoing. ORR will advise RAIB when actions to address this recommendation have been completed.**

### **Information in support of ORR decision**

8. On 8 November 2018 provided the following initial response:

*Network Rail is currently working with station operators to continue its work to identify cables.*

*Currently (Oct 2018), 70% of station footbridges with cabling have been positively identified and where applicable cabling secured to mitigate the risk of future cables snagging. Works are still ongoing with identification of structures with cabling and remedial works to secure cables.*

*Rafts, Services Bridges, Gantries: review of cabling affixed to these structures will be identified as part of the CEFA examinations regime.*

*Network Rail will undertake Annual Visual and Detailed Inspections that will be governed by a revision of the Standard NR/L3/CIV/006 Handbook for the Examination of Structures. This includes current structures, as well as those installed in the future. Any defects will be highlighted to the cable owner through the survey reporting and review process. This will be overseen by Building and Civils, NR.*