

openreach

ISIS Practice  
For Openreach and Contract Partners

AEI/ACC/N035

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# ***Fibre Repair – Headend to Splitter***

## ***About this document ...***

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### **Content approval**

This is the Issue 5 of this document.

The information contained in this document was approved on 25-Nov-2022  
by Scott Marshall, Accreditation Professional

## Version History

Version No.	Date	Author	Comments
Issue 5	25-Nov-2022	Quality Standards & Accreditation	Document re-formatted. Questionnaire amended.
Issue 4	03-Nov-2022	Quality Standards & Accreditation	Document review. Changes made to Sec 6 Method. Questionnaire now referenced and updated with new questions. Modular Guidance updated.
Issue 3	05-Nov-2021	Quality Standards & Accreditation	Document review. Changes made to the Questionnaire and Modular Guidance sections
Issue 2	26-May-2021	Quality Standards & Accreditation Network Engineering	Document review. Changed to new document layout. Safety requirements added. ISIS bookstore link checked. Reference paragraph updated. Review date now moved to two years.
Issue 1	03-Jun-2020	Quality Standards & Accreditation Network Engineering	Initial issue

Table of Content

<b>1</b>	<b>INTRODUCTION-----</b>	<b>5</b>
<b>2</b>	<b>SCOPE -----</b>	<b>5</b>
<b>3</b>	<b>DESCRIPTION -----</b>	<b>5</b>
<b>4</b>	<b>MEASUREMENT -----</b>	<b>6</b>
<b>5</b>	<b>SAFETY -----</b>	<b>6</b>
<b>6</b>	<b>METHOD-----</b>	<b>7</b>
<b>7</b>	<b>DELEGATE DETAILS -----</b>	<b>7</b>
<b>8</b>	<b>QUESTIONNAIRE -----</b>	<b>8</b>
<b>9</b>	<b>MODULAR GUIDANCE (PRACTICAL) -----</b>	<b>15</b>
<b>10</b>	<b>REFERENCES-----</b>	<b>17</b>

# 1 *Introduction*

This ISIS is reviewed and updated annually. Between reviews any changes are communicated using Access Engineering Communications (AEC).

Links to ISIS documents, accreditation modules and all reference material can be found in:

- [Technical Library](#), [Bookstore](#) or Policy & Build app for Openreach.
- CANDID for Contract Partners.

Answers for all modules are available via the Author of this document (see above).

In order to comply with the requirements of this accreditation module the Assessor must follow the procedure below:

- Allow the time shown for the Delegate to complete.
- Explain that reference documentation can be used.
- The criteria for **all** sections **must** be fulfilled in order to meet the requirements for this module.

# 2 *Scope*

The target audience for this accreditation is anyone working on the Openreach network including Contract Partners.

This module is essential for anyone carrying out fibre testing and repair work in the One Fibre Network (OFN). The overall content is covered in the following Description and Method sections, in more detail.

# 3 *Description*

This module consists of two parts, a questionnaire and a practical assessment.

**Prerequisite:** The Delegate must have successfully completed one of the below accreditations.

- [AEI/ACC/N023](#) - One Fibre Network (OFN) FTTP Strategic UG & OH Build
- [AEI/AEC/N026](#) - One Fibre Network FTTP Strategic UG Build

**Content:** It will check the Delegates understanding & ability to complete the testing and repair of fibres in the OFN, between the Optical Line Termination (OLT/Headend) and the Splitter using current working practices and quality standards.

**Duration:** Questionnaire 90 mins    **Practical:** Open

## 4 *Measurement*

**Questionnaire:** The Delegate must achieve **80%** or greater to be successful. Openreach people the questionnaire can be found on Learning Home as an online course using the code ORCHK039.

**Practical:** Using the Module Guidance and ISIS documents for reference, the Assessor will check that the Delegate completes the tasks outlined in the Method section.

The Module Guidance outlines where coaching can be provided, highlighted by a Coaching Mark (C) next to each Assessment Pointer. No more than **30%** of the available Coaching Marks can be used.

**Assessor Note:** The exact score required to pass the questionnaire and the allowed number of Coaching Marks can be found in the Delegates Details section.

**Post Assessment:** You must enter the results onto the [Skills Passport](#) or Smart Awards for Contract Partners.

## 5 *Safety*

**Caution:** If the Delegate displays a disregard for, or lack of knowledge of safety, then STOP THE ASSESSMENT - re-assessment required - refer to –safety module for guidance

Using their mandatory holding of safety and relevant access equipment, the Delegate will demonstrate to the Assessor, the correct safety practices required to successfully complete testing and repair in the OFN. This may include:

- Relevant safety modules on National Operative Passport Scheme (NOPS) card (Partners Only).
- Openreach Construction Design Management (CDM) 2015 Regulations Policy followed.
- Personal Protective Equipment (PPE).
- Equipment checks.
- Safe uses of steps when working at height (no metal ladders).
- Electrostatic precautions (ESP) used in the Exchange.
- Building security
- Availability of sharps bin.

## 6 *Method*

**Questionnaire:** Using reference documentation where required, the Delegate will complete the questionnaire. A maximum of **90** minutes is allowed for this exercise.

**Practical:** Using the correct tools, equipment and working practices, the Delegate will correctly identify a minimum of four and a maximum of 8 fibre faults between the Headend and Splitter. The faults where practical must be spread across the following categories at the Assessors discretion.

- Incorrect routing. Potential locations could include the Headend/OLT, Wave Division Multiplexor (WDM) in the Optical Distribution Frame (ODF) or out in the network such as at the Splitter.
- High Loss event, such as a macro-bend, bad splice, contaminated or incorrectly seated end faces on connectors, faulty hydra cables or fibre jumpers.
- Disconnection/Broken fibres.

The practical assessment can be completed under live or simulated working conditions using one of the below methods:

- On site – During new fibre repair tasks.
- On site – During relevant sections of different fibre repair tasks.
- Simulated in an approved Skill Centre or site.

**Assessor Note:** If a simulated environment is selected as the method, the Assessor will be responsible for using the relevant equipment to build the faulting network. They will also need to supply the Delegate with a INS record or routing sheet.

The Assessor will then use the Module Guidance to verify their understanding and ability to carry out the task.

## 7 *Delegate Details*

Module No	AEI/ACC/N035
Title	Fibre Repair – Headend to Splitter
Date	
Delegate's Name	

Delegate's UIN	
OUC	
Assessor's Name	
Assessor's UIN	
Questionnaire	PASS/FAIL
Practical	PASS/FAIL
Notes	

**Questionnaire Scoring:**

Total Possible Score	Score Achieved	Required Score to Pass
33		27


**Practical Scoring:**

Total Coaching Marks Available	Total Coached	Total Coaching Marks Allowed
5		1

## 8 *Questionnaire*

No.	Question	Mark(s)
1	What is the name of the new approved fibre cleaning kit?  A. Cleaning Kit Fibre 2A B. Stickler Cleaning Kit C. SC/APC Connector Cleaning Kit	



2	<p>What is used for the safe disposal of optical fibre off-cuts?</p> <p>A. Bins Optical Fibre Disposal  B. Bags packing  C. General waste bin</p>	
3	<p>Before connecting any tester to the FTTP network what MUST be done every time?</p> <p>A. Connectors should be cleaned using the approved IPA cleaning kit  B. Connectors must be wiped down with blue cloth  C. Connectors should be cleaned with alcohol wipes 1A</p>	
4	<p>What tool can be used to confirm if a connector is clean?</p> <p>A. EXFO remote tester  B. Optical Time Domain Reflectometer (OTDR)  C. In-direct Viewing Aid (IDVA)</p>	
5	<p>What pulse width is recommended on the OTDR when starting to test towards the splitter?</p> <p>A. 20 nanoseconds (ns)  B. 30 ns  C. 40 ns</p>	
6	<p>Please match the testing equipment up with its name below by pairing a letter with a number. Example answer A-4</p> <div style="text-align: center;">  <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <span>A</span> <span>B</span> <span>C</span> <span>D</span> </div> </div> <p>1. Optical Power Meter 3C</p>	

	2. Live Fibre Indicator 1B 3. Visible Light Source 1B 4. Optical Time Domain Reflectometer	
7	The Live Fibre Indicator 1B has 2 fibre size settings for testing?  A. True B. False	
8	Test leads must be inspected with a Microscope or Digital Inspection Device to prove they are not contaminated. How often should they be checked?  A. Every day B. Every week C. Every month	
9	Is it ok to buy a Visual Light Source online to use on the Openreach network?  A. Yes, they are stronger, and the light goes further. B. Yes, if you get approval from your manager. C. No, you must never use an unapproved Visual Light Source as they can cause damage or injury.	
10	Spare or growth fibres are stored where in an Optical Consolidation Rack (OCR)?  A. In the Cable Break Out (CBO) facility at the top of the OCR B. In the OCR Sub Rack tray C. Transport tubes	
11	What does SFPs stand for and what is their function?  A. Small Fibre Pluggable Transceivers. They control the speed of the circuit B. Small Form Factor Pluggable Transceivers. They convert the light signals into electrical ones and vice versa C. Signal Form Factor Plugs. They convert light signals into binary signals	

12	<p>If a DSLAM is 23km away from the Huawei Head-end what SFP should be deployed?</p> <p>A. 20km SFP  B. 30km SFP  C. 40km SFP</p>	
13	<p>What wavelength does the Optical Line Termination (OLT) downstream use?</p> <p>A. 1550dBm  B. 1625dBm  C. 1490dBm</p>	
14	<p>A passive splitter device directs the optical path from a single path to multiple pathways without the need for any extra equipment or power. What is an accurate representation of the loss induced by a single light path being divided in two?</p> <p>A. -3dBm  B. -4dBm  C. -5dBm</p>	
15	<p>The PON network has been designed to work at a maximum light level of what measured at the Optical Network Termination(ONT)?</p> <p>A. -24dBm  B. -26dBm  C. -27dBm</p>	
16	<p>When testing from the hydra cable a reflection maybe seen at the Optical Frame due to what?</p> <p>A. A reflectometer being fitted  B. A Wave Division Multiplexer (WDM) being fitted  C. Bad splice</p>	

17	<p>The routing for individual FTTP connections can be found on what system? Please select all that apply</p> <p>A. Phoenix GUI system B. CSS C. GEO HUB D. Integrated Network System (INS)</p>	
18	<p>What is a Macro-bend?</p> <p>A. A bend so small it cannot be seen in a trace B. A slow sweeping bend in the fibre C. A tight bend in the fibre which causes excessive attenuation.</p>	
19	<p>Macro-bends usually occur where in the network?</p> <p>A. In a cable length B. In fibre-handling enclosures C. The customer equipment</p>	
20	<p>When observing a Macro-bend what wavelength will show the greater loss?</p> <p>A. 1550nm B. 1490nm C. 1310nm</p>	
21	<p>True or False, Macro-bends can happen during the manufacturing process?</p> <p>A. True B. False</p>	
22	<p>Because the fibres on either side of a splice may have different back-scatter coefficients what should you do when testing?</p> <p>A. Test from the exchange then open a joint from your measurement B. Test the bad splice from both sides and compare measurements</p>	

	C. Test from the customer side it's probably closer to the fault	
23	<p>The One Fibre Network Build is governed by what ISIS document?</p> <p>A. NWK/LNK/C553  B. EPT/ANS/A040  C. EPT/ANS/A046</p>	
24	<p>Splitter outputs now come in 4 different colours; please select the correct order they should be installed.</p> <p>A. Blue, Orange, Red, Green  B. Blue, Red, Green, Orange  C. Blue, Orange, Green, Red</p>	
25	<p>What platforms can you use to run a toggle test?</p> <p>A. My Jobs (Openreach only)  B. FastTest+ (Openreach only)  C. FastTest2 Web Portal  D. CANDID Openreach Test Centre (Partners only)  E. All of the above</p>	
26	<p>What mandatory information is required to run an Auto Toggle test?</p> <p>A. Device ID, phone number, Headend port, CBT ID  B. Device ID, Headend ID, Headend Slot, Headend Port  C. Device ID, CBT ID, Headend ID, Headend Port</p>	
27	<p>A toggle test will confirm if you are working on the correct headend, when must this process NOT be used?</p> <p>A. At 5pm-8pm as the PON will be in peak demand  B. After 3+ customers are connected to the PON  C. After the PON has been released for service</p>	
28	<p>When testing using an Optical Test Head (OTH) what functions can it carry out? Select all that apply.</p> <p>A. OTDR trace</p>	

	B. Light loss test C. Auto Toggle D. Speed test E. Tone	
29	True or False. When running a trace using the OTH all customers on the PON will have a brief loss of service?  A. True B. False	
30	If you are running a test from the splitter using the OTH what is the maximum length of test lead you can use?  A. 500mm B. 750mm C. 1-2M	
31	What Refractive Index (RI) is used to test BT specification fibres?  A. 1.47 B. 1.57 C. 1.67	
32	If you have light on your allocated fibre at the Splitter Node, but the light will not toggle on or off, what could this indicate? Select all that apply.  A. OLT port or SFP faulty B. Incorrect routing at OLT (Slot and Port) C. Hydra cable spliced to incorrect external fibre in the Optical Fibre Frame D. Auto Toggle system faulty E. Fibre misrouted in the external network	
33	If you have a light reading of -29dBm at the Splitter what would this indicate? Select all that apply.  A. Faulty splice	

	B. SPF is faulty at the OLT C. Macro-bend D. Nothing, the fibre is ok E. Faulty or dirty fibre connector	

## 9 ***Modular Guidance (Practical)***

The below table should be used as a guide for the Assessor to accurately assess the Delegates knowledge and ability during the practical assessment.

Coaching Marks '**C**' are explained in the Measurement section and the total allowed can be found in Delegate Details.

If an Assessment Pointer is followed by an '**X**' then not only is no coaching allowed, but failure to meet the standard on the Assessment Pointer means that the standard has not been met for the accreditation a whole.

<b>Task Assessment</b>	<b>Assessment Pointers</b>	<b>Coaching</b>	<b>Document Guidance</b>
<b>Questionnaire</b>	Completed at required % or above.	X	
<b>Prerequisite</b>	The Delegate has successfully completed one of the required accreditations.	X	
<b>Trained /Skilled</b>	The Delegate is trained, experienced and craft competent in this skill.	X	
<b>Safety</b>	All safety procedures followed, and safe working practices adopted.	X	
<b>Risk Assessment</b>	An on-site risk assessment should be carried out.	X	
<b>Personal Protective Equipment (PPE)</b>	Correct PPE held, in good condition and used where necessary.	X	

<b>Environment</b>	Weather conditions considered before commencing work.	X	
	All rubbish and waste removed from site when the works have been completed.	X	
<b>Equipment Available</b>	Delegate has the correct tools and they are in good condition to complete the task to the current work practices and quality standards.	X	
	Tools used correctly and safely.	X	
<b>Practical Work</b>	Delegate has the approved cleaning kit available and used it correctly.	X	
	All test leads in good working order and connections cleaned before testing.	X	
	Delegate has good understanding of the OFN components.	C	
	Delegate can demonstrate an understanding of when light level checks are carried out.	X	
	Delegate can demonstrate knowledge of testing parameters i.e. wavelengths and optical losses.	C	
	Delegate can combine the information from the trace and network records to indicate a fault location.	C	
	Delegate can use and understand INS routings.	X	
<b>Headend and Optical Frames</b>	Delegate follows the electrostatic precautions procedure.	X	
	Correct rack/suite identified.	X	
	Delegate demonstrates good working knowledge of the Optical Fibre Frames (OCR, ODF, OFR).	X	
	Delegate understands the slot and port numbering sequence.	C	
<b>Faulting</b>	Delegate can identify and resolve incorrect Headend/OLT routing, using the correct techniques.	X	
	Delegate can identify and resolve a dirty connector fault, using the correct techniques.	X	



	Delegate can identify and resolve a Macro-bend fault, using the correct techniques.	X	
	Delegate can identify and resolve a bad splice or other high light loss event, using the correct techniques.	X	
<b>Completion of Work</b>	Where required all changes made to planned routing are recorded and the planner is informed.	C	
	Observed fibres defects (not worked on within same work point/rack) reported to the FRAC when judged impractical to repair on-site.	X	
	A1024 raised where required.	X	

## 10 *References*

All the documents below are available through the sites and systems described in the Introduction section. If you require access to external sources within them, then please contact the Author (see above) of this accreditation module.

**Assessors Note:** All Openreach people should have access to the Policy & Build app via their work mobile phones. Please make sure that this app is accessed during the accreditation.

- SFY/HSH/A001 - Health & Safety Handbook (Openreach only).
- CPE/NNS/V060 - Guide to Health & Safety Minimum Standards.
- SFY/HSH/C031 - Openreach Construction Design Management (CDM) 2015 Regulations Policy.
- EPT/COF/C008 - Testing practices for PTO engineers testing in the Fibre to the Premises (FTTP) network
- EPT/COF/D967 - ODF Installation (Openreach Only)
- NWK/LNK/C553 - Fibre – Optical Distribution Frame - ODF – Policy
- NWK/LNK/C213 - NGA - Optical Consolidation Rack (OCR) - Policy
- LW350 (Openreach Only)
- EPT/COF/D910 - Optical Cable Acceptance Testing
- EPT/COF/D956 - Testing practices for field Engineers commissioning and installing the Fibre To The Premises (FTTP) network

- EPT/COF/D983 - Auto Toggle Practices & Procedures
- EPT/ANS/A040 - One Fibre Network – Build Quality Manual for Engineers
- Planning Policy Briefing No.423

<b>END OF DOCUMENT</b>
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