Test Project

Module D - Optical fiber speed test

Emergency Optical Fiber Restoration

ICT Network Infrastructure

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Introduction

Module D is a spectator-oriented speed challenge for verifying whether Competitors can rapidly restore optical fiber connections under emergency conditions.

This module focuses on speed, stability, and valid restoration, rather than simple splicing quantity. Competitors are expected to demonstrate fast and reliable fusion splicing using both single-core optical fibers and 12-core ribbon optical fibers, with each restoration confirmed as a valid connection.

Description of project and tasks

Module D simulates emergency optical fiber restoration under time pressure. It is designed as a spectator-oriented speed competition using both single-core optical fibers and 12-core ribbon optical fibers.

Competitors are required to perform fusion splicing and heat-shrink sleeve protection within the specified competition time. The result is not determined by speed alone; only restorations confirmed as valid are counted, and connection quality and operational stability are also considered.

Task 1 is a tournament-style single-core fusion splicing speed challenge. Competitors advance through stages based on the number of valid restorations completed within each stage.

Task 2 is a continuous 12-core ribbon fiber fusion splicing speed challenge. Bonus points are awarded for consecutive successful restorations.

The screens of Competitors' fusion splicers shall be displayed on monitors within the competition area during the competition.

Instructions to the Competitor

The competition time for this module is as follows:

TASK	DESCRIPTION	COMPETITION TIME
Task 1	Single-core fiber restoration tournament challenge	Maximum 65 minutes
Task 2	12-core ribbon fiber restoration challenge	20 minutes

Fusion splicers and related tools shall be provided or approved by the organizer.

Task 1: Single-core Fiber Fusion Splicing Speed Tournament Challenge

This task is a tournament-style speed competition that evaluates the Competitor's ability to rapidly perform emergency restoration using single-core optical fibers.

Competitors shall continuously perform fusion splicing and heat-shrink sleeve protection of single-core optical fibers within the specified competition time.

Only restorations confirmed as valid connections shall be counted.

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Competition time and Stage Structure

This task shall be conducted in the following stages.

STAGE	COMPETITORS	QUALIFICATION	COMPETITION TIME
Stage 1	14 Competitors	Top 7 Competitors advance to Stage 2	30 minutes
Stage 2	7 Competitors	Top 2 Competitors advance to Final Stage	20 minutes
Final Stage	2 Competitors*	Final ranking determination	15 minutes

* The number of Competitors advancing to the Final Stage may be adjusted if necessary.

Competition Rules and Valid Splice Criteria

[1] Competition Rules

- Before the start of the competition, Competitors shall connect the specified pigtail to the starting end of the fibre.
- Competitors shall perform fusion splicing sequentially from the starting end so that all fusion splices form one continuous optical fibre path. After each fusion splice, the outgoing end of the connected fibre shall be used for the next fusion splice, and splicing shall continue along the same path. Competitors shall not start a separate splice path using another fibre.
- Competitors shall continuously perform fusion splicing from the start signal until the end of the competition time.
- Competitors shall not change the settings of the fusion splicer.
- The fusion splicer screens shall be displayed on monitors in the competition area during the competition.

[2] Stage Ranking

- Rankings for each stage shall be determined by the number of valid fusion splices completed within the competition time.
- In the event of a tie, the Competitor who completed the final valid fusion splice earlier shall rank higher.
- If still tied, the Competitor with fewer invalid fusion splices shall rank higher.

[3] Valid Fusion Splice Criteria

Only valid fusion splices confirmed by the Experts shall be counted.

A fusion splice that fails to meet any one of the above requirements shall be considered invalid and shall not be counted:

- The heat-shrink sleeve is properly heated and installed without defects.
- The estimated splice loss displayed by the fusion splicer does not exceed the specified maximum splice loss.
- A continuous optical fibre path is established from the starting end to the splice being assessed. This shall be verified by injecting visible light from the pigtail at the starting end and confirming continuity up to the splice being assessed.

A fusion splice that does not meet any of the above requirements shall be considered invalid and shall not be counted.

[4] Work Process Requirements and Penalty

Competitors shall comply with the following work process requirements:

- Each fibre shall be cleaned at least three times using a wipe moistened with ethanol before fusion splicing.
- The fibre stripper shall be cleaned at least three times during each stage.

If an Expert determines that a Competitor has failed to comply with either of the above requirements, five valid fusion splices shall be deducted from the Competitor's result for each violation.

Task 2: 12-core Ribbon Fiber Speed Challenge

This task evaluates the ompetitor’s ability to rapidly and continuously perform emergency restoration using 12-core ribbon optical fibers.

Competitors shall continuously perform fusion splicing and heat-shrink sleeve protection of 12-core ribbon optical fibers within the specified competition time.

Only restorations confirmed as valid connections shall be counted.

Competition Time

The competition time for Task 2 shall be 20 minutes.

Competition Rules and Valid Splice Criteria

[1] Competition Rules

- Competitors shall perform 12-core ribbon fibre fusion splicing from the start signal until the end of the competition time.
- Only valid fusion splices shall be counted.
- When an invalid fusion splice occurs, the consecutive valid splice count shall be reset to zero.
- Competitors shall not change the settings of the fusion splicer.
- The fusion splicer screens shall be displayed on monitors in the competition area during the competition.

[2] Scoring System and Ranking

- Each valid fusion splice shall be awarded 1 point.
- Additional points shall be awarded for consecutive valid fusion splices in accordance with the table below.
- Within each uninterrupted sequence of valid fusion splices, a bonus of 1 point shall apply when three consecutive valid splices are achieved. If the sequence reaches five consecutive valid splices, the bonus for that sequence shall be increased to 2 points in total; the 1-point and 2-point bonuses shall not be cumulative. No additional bonus shall be awarded for the sixth or any subsequent consecutive valid splice. An invalid splice resets the consecutive valid-splice count. The next valid splice shall be counted as the first splice of a new sequence.
- When an invalid fusion splice occurs, the consecutive valid splice count shall be reset to zero, and a new consecutive valid splice count shall begin with the next valid fusion splice.
- Rankings shall be determined by the total number of points at the end of the competition time.
- In the event of a tie in total points, the Competitor with the greater number of valid fusion splices shall rank higher.
- If still tied, the Competitor who completed the final valid fusion splice earlier shall rank higher.

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ITEM	SCORE
One valid restoration	1 point
3 consecutive successful restorations	+1 bonus point
5 consecutive successful restorations	+2 bonus points
Invalid restoration	0 point and consecutive success count reset

[3] Valid Fusion Splice Criteria

A 12-core ribbon fibre fusion splice shall be considered valid only when all of the following requirements are met:

- The heat-shrink sleeve is properly positioned and heated.
  The fusion splice is confirmed as valid by the Experts.Scoring Rules

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