

5.6 OPERATION TESTS FOR DATA COMMUNICATION LINKS (DCL)

Note: Refer to Appendix E2.10, Data Communication Link Test.

5.6.1 Each *data communication link* (DCL) shall be tested to confirm that a *trouble signal* is received at the *control unit* or *transponder* under an open loop fault.

5.6.2 Where *fault isolation modules* are installed in *data communication links* serving *field devices*, wiring shall be shorted on the isolated side, *annunciation* of the fault confirmed, and then a *field device* on the source side shall be operated, and activation confirmed at the *control unit* or *transponder*.

5.6.3 Where fault isolation in *data communication links* is provided between *control units* or *transponders* and between *transponders*, introduce a *short circuit fault* and confirm annunciation of the fault and operation outside the shorted section between each pair of:

- A *Control unit to control unit*;
- B *Control unit to transponder*, and
- C *Transponder to transponder*.

5.7 FIELD DEVICES

5.7.1 General

5.7.1.1 Each *field device* shall be *inspected* to confirm the following, as applicable:

- A Free of damage;
- B Free of foreign substance (e.g. paint);
- C Mechanically supported independent of wiring; and
- D Protective dust shields or covers removed.

5.7.1.2 Each enabled function/feature of the *field device* shall be *tested* and annunciation confirmed while connected to the *control unit* or *transponder*.

5.7.1.3 All *field devices* shall be tested on a yearly basis, except in the event that a device cannot reasonably be made accessible for safety considerations (for example, continuous process operations, energized electrical equipment, radiation, and height), the device and its location shall be recorded and identified as "inaccessible" in the remarks column of the report similar to that shown in Appendix E3.2, Individual Device Record. The last *test date* shall also be recorded in the remarks column of E3.2. Those *field devices* identified as being inaccessible as noted in the remarks column of E3.2, shall be *tested* at least once every two years.

- C Calibrated instruments that provide the operation as described in CAN/ULC-S529, Standard for Smoke Detectors for Fire Alarm Systems, for the purpose of *testing smoke detector sensitivity*.

5.7.4.2 Remote Indicator Units

5.7.4.2.1 Each remote indicator unit providing visual indication from a *smoke detector* shall be *inspected* and *tested* to confirm that the visual indication is clearly visible from the direction of travel to the protected area.

5.7.4.3 Status Change Confirmation (Alarm Verification Feature)

5.7.4.3.1 *Status change confirmation*, where provided, shall be *inspected* and *tested* to confirm and record that only *smoke detectors* are affected by the operation of the *status change confirmation* circuitry. (Refer to Appendix E3.1, Field Device Testing-Legends and Notes, and Appendix H, Status Change Confirmation (Alarm Verification Feature).)

5.7.4.4 Additional Requirements for Air Duct Type Smoke Detectors

5.7.4.4.1 Each air duct type *smoke detector* shall be *inspected* and *tested* to confirm operability.

5.7.4.4.2 The positive airflow and/or sampling tube differential pressure in air duct type *smoke detectors* shall be *tested* to confirm that it is within manufacturer's specified limits.

5.7.4.5 Beam Type Smoke Detectors

5.7.4.5.1 Each *beam type smoke detector* shall be *inspected* and *tested* to confirm operability, including the following functions/features, as applicable:

- A Activation by the use of a manufacturer's recommended *testing* method for the device (e.g. screens, filters, etc.); and
- B Sensitivity in accordance with the manufacturer's sensitivity limits. Record the sensitivity and device location (both physically and by address, where applicable). (Refer to Appendix E3.1, Field Device Testing-Legend and Notes.)

5.7.5 Flame Detectors

5.7.5.1 Each *flame detector* shall be *inspected* and *tested* to confirm the operability as recommended by the manufacturer. All functions/features of the device shall be *tested*.

5.7.6 Combination Type Detectors

5.7.6.1 Each combination type detector, using a combination of detection principles shall be *tested* to the requirements appropriate to each principle of operation and as recommended by the manufacturer.

5.7.7 Automatic Detectors – Other Types

5.7.7.1 Each detector shall be *inspected* and *tested* to confirm operability, including the following functions, as applicable:

- A Alarm initiation using alarm initiating source recommended by the manufacturer;
- B Detector is oriented so as to detect the hazard; and
- C *Test* for sensitivity as per manufacturer's recommendations and record the device location address and sensitivity where applicable

5.7.8 Devices for Water Type Extinguishing Systems

5.7.8.1 Waterflow Detection Devices

5.7.8.1.1 Each waterflow detecting device shall be *inspected* and *tested* to confirm operability, including the following functions, as applicable:

- A Waterflow detecting devices (paddle and pressure type) including associated *input circuits*, shall be *tested* by an appropriate waterflow means; and
- B Time delay setting shall be recorded in the individual device record. (Refer to Appendix E3.1, Field Device Testing-Legends and Notes)

NOTE: It is recommended that *tests* be coordinated with sprinkler *tests*, and it should be noted that more frequent *testing* of sprinkler system devices may be required by the National Fire Code of Canada.

5.7.8.2 Supervisory Devices

5.7.8.2.1 Each shut-off valve position supervisory switch shall be *tested* to determine that within two turns of the valve handle, or when the stem of the valve has moved 20% from its normal position, it shall result in an audible common *trouble signal* and a visual indication.

5.7.8.2.2 Each low pressure *supervisory device* shall be *inspected* and *tested* to confirm the operability of the following functions, as applicable:

- A A decrease of pressure beyond the set limit results in an audible *trouble signal* and a visual indication; and
- B The low pressure (kPa) setting at which the device initiates a *trouble signal* and the upper pressure setting where the device is no longer activated shall be recorded. (Refer to Appendix E3.1, Field Device Testing-Legends and Notes.)

5.7.8.2.3 Each low water level *supervisory device* shall be *tested* by lowering the water level sufficiently, or by simulating its electrical operation at the wiring points of the device to result in an audible *trouble signal* and a visual indication.

F3 BATTERY CAPACITY METER TEST

F3.1 The capacity should not be less than the calculated A•h requirements of the system after the *test*, otherwise, replace batteries:

- A Disconnect *test* battery from system;
- B Connect the capacity meter across the battery in accordance with the meter manufacturer's instructions; and
- C Note the capacity of the battery.

F4 BATTERY CAPACITY CALCULATION

F4.1 Perform battery capacity calculation as follows:

- A [Supervisory current as per Appendix E2.5 Item D] x [Supervisory Requirement (h)] = A•h
- B [Full load current (A) as per Appendix E2.5 Item E] x [Alarm Requirement (h)] = A•h
- C System Battery Capacity Requirement A•h = (F4.1 Item A result) + (F4.1 Item B result)

Enter the result into Appendix E2.5 Item Q of the report.

F5 EMERGENCY POWER FOR FIRE ALARM SYSTEMS – NBC 1995

Note: Subsection F5 is an extract from the National Building Code of Canada 1995, and is provided for information only. Please consult the National Building Code of Canada for the exact reference and requirement. The numbering system used in this extract corresponds with that used in the National Building Code of Canada and is independent of the numbering system used in the rest of this Standard.

3.2.7.8 Emergency Power for Fire Alarm Systems

- 1) An emergency power supply conforming to Sentences (2), (3) and (4) shall be provided for fire alarm systems.
- 2) The emergency power supply required by Sentence (1) shall be supplied from
 - a) a generator,
 - b) batteries, or
 - c) a combination thereof.
- 3) The emergency power supply required by Sentence (1) shall be capable of providing
 - a) supervisory power for not less than 24 h, and
 - b) immediately following, emergency power under full load for not less than
 - i) 2 h for a building within the scope of Subsection 3.2.6.,
 - ii) 1 h for a building classified as Group B major occupancy that is not within the scope of Subsection 3.2.6.,
 - iii) 5 min for a building not required to be equipped with an annunciator, and
 - iv) 30 min for any other building.

(See Appendix A.)