

I need to test how often?

by Dean K. Wilson, P.E.

My company installs central station fire alarm and signaling systems as a subcontractor for a large national central station operating company. We provide design, installation, testing, and maintenance services for a quad-state area in the central U.S. We recently submitted a proposal for the review and approval of a local Authority Having Jurisdiction. The AHJ rejected our documents, stating that the testing frequency we had proposed for the Digital Alarm Communicator Transmitter (DACT) did not meet NFPA 72-2013, *National Fire Alarm and Signaling Code*[®]. We have always used two telephone lines provided by the customer to connect our DACTs to the public switched telephone network. We have always programmed the DACT to initiate a test call to the Digital Alarm Communicator Receiver (DACR) at the central station once each 24 hours. We alternate which telephone line we use to transmit the test signal from the DACT. Why doesn't this long-established test procedure meet the requirements referenced by the AHJ?

The simple answer: Because the procedure you outlined no longer complies with the requirements of the *Code*.

For comparison purposes, take a look at the appropriate paragraph from NFPA 72-2010:

26.6.3.2.1.5 DACT Transmission Means. The following requirements shall apply to all digital alarm communications transmitters:

- (1) A DACT shall be connected to two separate means of transmission at the protected premises.

- (2) The DACT shall be capable of selecting the operable means of transmission in the event of failure of the other means.
- (3) The primary means of transmission shall be a telephone line (number) connected to the public switched network.
- (4)* The first transmission attempt shall utilize the primary means of transmission.
- (5) Each DACT shall be programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful.
- (6) Each DACT shall automatically initiate and complete a test signal transmission sequence to its associated DACR at least once every 24 hours. A successful signal transmission sequence of any other type, within the same 24-hour period, shall fulfill the requirement to verify the integrity of the reporting system, provided that signal processing is automated so that 24-hour delinquencies are individually acknowledged by supervising station personnel.
- (7)* If a DACT is programmed to call a telephone line (number) that is call forwarded to the line (number) of the DACR, a means shall be implemented to verify the integrity of the call forwarding feature every 4 hours.

As you can clearly read, 26.6.3.2.1.5(6) requires that the DACT initiate and complete a test signal to the DACR at least once *each 24 hours*. If the central station employs software that keeps track of the signals and if the DACT also keeps track of how often it transmits a signal, any transmission from a DACT that the central station successfully receives can count as the test signal. However, most DACTs and DACRs do not have this capability. Therefore, most DACTs simply send a test signal every 24 hours.

To somewhat simply this testing process, whenever two telephone lines provide the transmission means, paragraph 26.6.3.2.1.4(B) *Exception No. 2* permitted:

Exception No.2: Where two telephone lines (numbers) are used, it shall be permitted to test each telephone line (number) at alternating 24-hour intervals.

The procedure you describe in your question obviously meets these requirements from NFPA 72-2010, *National Fire Alarm and Signaling Code*[®].

However, you must now read the new requirements found in NFPA 72-2013:

26.6.3.2.1.3* Requirements for DACTs.

A.26.6.3.2.1.3 To give the DACT the ability to disconnect an incoming call to the protected premises, telephone service should be of the type that provides for timed-release disconnect. In some telephone systems (step-by-step offices), timed release disconnect is not provided.

(A) A DACT shall be configured so that, when it is required to transmit a signal to the supervising station, it shall seize the telephone line (going off-hook) at the protected premises and disconnect an outgoing or incoming telephone call and prevent use of the telephone line for outgoing telephone calls until signal transmission has been completed. A DACT shall not be connected to a party line telephone facility.

(B) A DACT shall have the means to satisfactorily obtain a dial tone, dial the number(s) of the DACR, obtain verification that the DACR is able to receive signals, transmit the signal, and receive acknowledgment that the DACR has accepted that signal. In no event shall the time from going off-hook to on hook exceed 90 seconds per attempt.

(C)* A DACT shall have means to reset and retry if the first attempt to complete a signal transmission sequence is unsuccessful. A failure to complete connection shall not prevent subsequent attempts to transmit an alarm where such alarm is generated from any other initiating device circuit or signaling line circuit, or both. Additional attempts shall be made until the signal transmission sequence has been completed, up to a minimum of 5 and a maximum of 10 attempts.

A.26.6.3.2.1.3(C) A DACT can be programmed to originate calls to the DACR telephone lines (numbers) in any alternating sequence. The sequence can consist of single or multiple calls to one DACR telephone line (number), followed by transmissions on the alternate path or any combination thereof that is consistent with the minimum/maximum attempt requirements in 26.6.3.2.1.3(C).

(D) If the maximum number of attempts to complete the sequence is reached, an indication of the failure shall be made at the premises.

26.6.3.2.1.4 Transmission Channels.

(A) A system employing a DACT shall employ one telephone line (number). In addition, one of the following transmission means shall be employed:

- (1) One-way private radio alarm system
- (2) Two-way RF multiplex system
- (3) Transmission means complying with 26.6.3.1

Exception: Where access to two technologies in the preceding list is not available at the protected premises, with the approval of the authority having jurisdiction, a telephone line (number) shall be permitted to be used as the second transmission means. Each DACT shall be programmed to call a second DACR line (number) when the signal transmission sequence to the first called line (number) is unsuccessful. The DACT shall be capable of selecting the operable means of transmission in the event of failure of the other means. Where two telephone lines (numbers) are used, it shall be permitted to test each telephone line (number) at

alternating 6-hour intervals.

(B) The following requirements shall apply to all combinations listed in 26.6.3.2.1.4(A):

- (1) The means for supervising each channel shall be in a manner approved for the method means of transmission employed.
- (2) The interval for testing each channel shall not exceed 6 hours.
- (3) The failure of either channel shall send a trouble signal on the other channel within 4 minutes.
- (4) When one transmission channel has failed, all status change signals shall be sent over the other channel.
- (5) The primary channel shall be capable of delivering an indication to the DACT that the message has been received by the supervising station.
- (6)* The first attempt to send a status change signal shall use the primary channel.

Exception: Where the primary channel is known to have failed.

A.26.6.3.2.1.4(B)(6) Where two telephone lines (numbers) are used, care should be taken to assign the primary DACT telephone line (number) to a nonessential telephone line (number) at the protected premises so that the primary line used in the premises is not unnecessarily interrupted.

- (7) Simultaneous transmission over both channels shall be permitted.
- (8) Failure of telephone lines (numbers) shall be annunciated locally.

26.6.3.2.1.5 DACT Transmission Means. The following requirements shall apply to all digital alarm communications transmitters:

- (1) A DACT shall be connected to two separate means of transmission at the protected premises.
- (2) The DACT shall be capable of selecting the operable means of transmission in the event of failure of the other means.
- (3) The primary means of transmission shall be a telephone line (number) connected to the public switched network.
- (4)* The first transmission attempt shall utilize the primary means of transmission.

A.26.6.3.2.1.5(4) Where two telephone lines (numbers) are used, care should be taken to assign the primary DACT telephone line (number) to a nonessential telephone line (number) at the protected premises so that the primary line used in the premises is not unnecessarily interrupted.

- (5) Each DACT shall be programmed to call a second receiver when the signal transmission sequence to the first called line (number) is unsuccessful.
- (6) Each transmission means shall automatically initiate and complete a test signal transmission sequence to its associated receiver at least once every 6 hours. A successful signal transmission sequence of any other type, within the same 6-hour period, shall fulfill the requirement to verify the integrity of the reporting system, provided that signal processing is automated so that 6-hour delinquencies are individually acknowledged by supervising station personnel.
- (7)* If a DACT is programmed to call a telephone line (number) that is call forwarded to the line (number) of the DACR, a means shall be implemented to verify the integrity of the call forwarding feature every 4 hours.

As you read through these extensive requirements, you will note the changes that have occurred in this 2013 edition. Paragraph 26.6.3.2.1.5(6) requires tests of the DACT's transmission means *every six hours*. That's right: every six hours! The last portion of the very long *Exception* to Paragraph 26.6.3.2.1.4(A) indicates that where a DACT uses two telephone lines, the six-hour test may alternate between the two telephone lines.

I think you can now see where your carefully crafted procedure for DACT Testing no longer meets the requirements of NFPA 72-2013, *National Fire Alarm and Signaling Code*[®]. This change to increase the testing frequency, from every 24 hours to every six hours, likely responds to the perceived degrading of the reliability of the public switched telephone network. So many local telephone lines extending from neighborhood multiplexers no longer have 24 hours of standby power. (We have discussed this issue in at least two previous editions of this column.) By testing more frequently, we can help assure the overall integrity of the transmission means.

This change became incorporated into NFPA 72-2013 as the result of an appeal regarding the issuance of a Tentative Interim Amendment to the *Code*. The NFPA Standards Council upheld the appeal, issued the TIA, and incorporated the changes into the printed version of the *Code* at the time of their acceptance of the *Code* for publication.

This incident reinforces how careful attention to each new *Code* helps prevent a company, such as yours, continuing procedures that no longer meet the requirements.

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