



Automatic Fire Alarm System Agreement

Instruction No. 3

AFASP IP Communication System Interface Testing

Issued under Automatic Fire Alarm System Agreement
Terms and Conditions (AFA-C-01), clauses 2, 4 and 5

Field Operations Division

1 Purpose

- 1.1 The purpose of this document is to describe Fire and Rescue NSW (FRNSW) testing requirements for applicant and existing automatic fire alarm third party service providers (AFASPs) to demonstrate compliance to the *AFA/ESCAD IP Communication System Interface Specification (AFA-S-01, AFA-S-03)*.
- 1.2 The purpose of AFASP communication system interface testing is to verify initial and ongoing interconnectability with the FRNSW Emergency Services Computer Aided Dispatch (**ESCAD**) network. This verification promotes the integrity and service availability of the network for all AFASPs and their Customers.

2 Introduction

- 2.1 New communication system interfaces, existing communication system interface upgrades, and unintended interface changes all pose risks to the integrity of the FRNSW AFA/ESCAD network.
- 2.2 FRNSW mitigates interconnectivity risks through Mandatory and Voluntary Acceptance Testing and Confirmation Testing of AFASP communication system interfaces.

3 Mandatory Testing

- 3.1 The AFASP must undertake mandatory testing of the FRNSW AFA/ESCAD network on the occasions (i.e. Acceptance Testing and Confirmation Testing) indicated in the following table:

Mandatory Test Occasion	Test Type	Test Features			
		Applicant AFASP	Existing AFASP	Periodic Testing	Non-Periodic Testing
New System	Acceptance Testing	✓	✓		
Existing System - Upgrade	Acceptance Testing		✓		
Existing System - No Change	Confirmation Testing		✓	✓	✓

- 3.2 The AFASP must complete mandatory confirmation testing (i.e. of an Existing System - No Change) within 12 months of the previous successful (mandatory or voluntary) test of the AFASP's same communication system interface.
- 3.3 FRNSW may at its own discretion require an AFASP to retest its communication system interface at any other time.

4 Voluntary Testing

- 4.1 Voluntary confirmation testing (i.e. of an Existing System - No Change) may occur at the discretion of the AFASP.
- 4.2 Voluntary testing is limited to two successive test attempts within a series, within a 12 month period.

5 Requirement to Pass Test

- 5.1 An AFASP must pass formal testing of its communication system interface against the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03):
- in the case of mandatory acceptance testing (i.e. New System or Existing System - Upgrade), before system commissioning; and
 - in the case of mandatory or voluntary confirmation testing (i.e. Existing System - No Change), in order to continue system operation.
- Note:** See *Automatic Fire Alarm System Agreement Terms and Conditions* (AFA-C-01), clause 4.
- 5.2 FRNSW will declare a test as failed if the AFASP's communication system interface does not conform to the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03).
- 5.3 FRNSW may deem failure of any stage of test to be a failure of all tests.
- 5.4 At FRNSW's discretion, a test failure may necessitate repetition of all test stages (and the AFASP must immediately comply with any direction given by FRNSW to the AFASP to repeat a test (or stage thereof)).
- 5.5 FRNSW may immediately disconnect an AFASP's communication system interface if testing identifies non-compliance to the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03), or it does or could negatively impact on the FRNSW AFA/ESCAD network.

Note: See *Automatic Fire Alarm System Agreement Terms and Conditions* (AFA-C-01), clause 4.

6 Test Preparation

- 6.1 The following test notice is required:
- FRNSW will give the AFASP two weeks' notice for mandatory testing; and
 - the AFASP must give FRNSW four weeks' notice for voluntary testing.
- 6.2 If an existing AFASP intends to test its production (live) system, the AFASP must have an alternative procedure in place before testing, to ensure that all alarm calls from its connected Alarm Installations occurring during testing will be promptly manually reported.
- Note:** See Instruction No. 2: *AFASP Manual Reporting of Alarm Calls and Communication System Failures* (AFA-I-02).
- 6.3 The AFASP must submit a written application for communication system interface testing (whether mandatory or voluntary) using *AFA/ESCAD IP Communication System Interface Test Registration Form* (AFA-F-04). The Test Registration Form (AFA-F-04) provided by the AFASP must indicate:
- AFASP status - applicant (new) AFASP or existing AFASP;

- Test status - mandatory or voluntary;
- Test type - acceptance or confirmation;
- Test number - the number of successive attempts within a test series, including test failures and the test currently being registered;
- Name and version of the software to be tested;
- AFASP AFA/ESCAD system to be tested - Development (Test) or Production (Live) system (existing AFASPs only);
- Technical contact's name and telephone number; and
- Contract-nominated contact's name and telephone number.

6.4 On receipt of a Test Registration Form (AFA-F-04) submitted by an AFASP, FRNSW arranges a test time and date with the AFASP's Nominated contact.

6.5 An applicant AFASP obtains from FRNSW a copy of the FRNSW Emergency Service Computer Aided Dispatch Communication Emulation (ESCADEM) software. An existing AFASP may request another copy of the ESCADEM software if required.

Note: See *Automatic Fire Alarm System Agreement Terms and Conditions (AFA-C-01)*, clause 2.

6.6 CADEM software installed on the AFASP's system must have the following functionality:

- (a) emulation of the ESCAD implementation of *AFAF/ESCAD IP Communication System Interface Specification (AFA-S-01, AFA-S-03)*;
- (b) introduction of protocol exceptions as defined below at randomly selected times or on operator command;
- (c) production of a time stamped log of all communications across the system interface for later analysis;
- (d) display on completion of testing or thereafter of individual messages, polls and other communications across the system interface in a format which allows the identification of individual field and data content;
- (e) retention and export of logs as historical records of testing;
- (f) sending of alarm query messages to one predefined AFASP ID using four predefined Address IDs, and checking for response;
- (g) sending and receipt of free format messages; and
- (h) pre-scripting of free format messages, alarm queries, and other responses to alarm messages where options apply to the response which may be made.

6.7 CADEM software installed on the AFASP's system must meet or exceed the following performance and capacity requirements:

- (a) a sustained mean rate of transmission of 17 alarms and responses per minute over a period of one hour; and
- (b) capacity to log a test of two hours duration.

- 6.8 The AFASP must perform preparatory, in-house testing of its communication system interface against the CADEM software installed on its own computer, before commencement of formal testing, to ensure that connectivity can be achieved and maintained in accordance with the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03).
- 6.9 CADEM preparatory testing. The CADEM software used by the AFASP must inject protocol violations into the data stream, and must monitor the AFASP's communication system interface response. In all cases the response must be error recovery according to the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03), including the following:
- (a) Send message flow halt;
 - (b) Send error 1 message;
 - (c) Send error 2 message;
 - (d) Send error 4 message followed by message flow halt;
 - (e) Withhold message level acknowledgement in response to incoming alarm message for 7 seconds;
 - (f) Withhold message level acknowledgement in response to incoming poll message for 7 seconds;
 - (g) Withhold message level acknowledgement in response to incoming alarm message for 16 seconds;
 - (h) Withhold message level acknowledgement in response to incoming poll message for 16 seconds;
 - (i) Withhold message level acknowledgement in response to incoming alarm message indefinitely;
 - (j) Withhold message level acknowledgement in response to incoming poll message indefinitely;
 - (k) Send an incorrectly formatted message; and
 - (l) Send an incorrectly sequence numbered message.

7 Formal Test Procedure

- 7.1 Formal testing which must be undertaken by the AFASP must comprise three stages: Initial Testing, System Testing, and Completion Testing.
- 7.2 Each formal test stage must be successfully completed by the AFASP in turn.
- 7.3 At FRNSW discretion certain stages or parts of stages may be omitted (e.g. Stage 1: Initial Testing may be omitted for Confirmation Testing).
- 7.4 FRNSW will retain a log as a record of each formal test.

8 Formal Test Procedure - Stage 1: Initial Testing

- 8.1 On acceptance by FRNSW of the *AFA/ESCAD IP Communication System Interface Test Registration Form* (AFA-F-04), FRNSW will issue the AFASP with

the following test kit, in accordance with the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03):

- AFASP ID (applicant AFASP only);
- TCP/IP connection details (applicant AFASP only); and
- A test script (See *AFASP Acceptance Test Procedure Script*).

Note: The above test kit allows AFASP access only to the FRNSW AFA/ESCAD Communication Emulator (CADEM), the test version of the FRNSW AFA/ESCAD communication system.

- 8.2 The test duration is approximately one hour.
- 8.3 The AFASP must execute actions in accordance with the test script or otherwise as requested by the FRNSW.
- 8.4 FRNSW will inject a selection of errors, free format messages, and alarm query messages into the test data stream, and will monitor the AFASP's communication system interface for compliance to the *AFA/ESCAD IP Communication System Interface Specification* (AFA-S-01, AFA-S-03).
- 8.5 FRNSW will provide to the AFASP a copy of the test log produced by the CAD Emulator at test completion if requested.

9 Formal Test Procedure - Stage 2: System Testing

- 9.1 At FRNSW discretion this Stage may be omitted for Confirmation Testing.
- 9.2 FRNSW will connect the AFASP to the FRNSW development AFA/ESCAD communication system.
- 9.3 The AFASP must perform the following tests:
- (a) Forwarding of alarm messages to FRNSW;
 - (b) Response to alarm query messages originating from FRNSW;
 - (c) Disconnection by the AFASP and successful recovery; and
 - (d) Disconnection by FRNSW and successful recovery.
- 9.4 On verbal request, FRNSW will provide to the AFASP within 8 business hours a time stamped log of the following transmission events:
- (a) All messages sent and received other than poll messages.
 - (b) Poll timeouts.
 - (c) Connection times.

Note: Records of other transmission events may be provided by FRNSW to the AFASP by prior agreement and may incur additional fees. See *Schedule of AFASP Fees and Charges* (AFA-P-30).

10 Formal Test Procedure - Stage 3: Connection Testing

- 10.1 FRNSW will connect the AFASP to the FRNSW production AFA/ESCAD communication system.

- 10.2 The AFASP must perform the following tests:
- (a) Forwarding of alarm messages to FRNSW;
 - (b) Response to alarm query messages originating from FRNSW;
 - (c) Disconnection by the AFASP and successful recovery; and
 - (d) Disconnection by FRNSW and successful recovery.
- 10.3 On verbal request FRNSW will provide to the AFASP within 8 business hours a time stamped log of the following transmission events:
- (a) All messages sent and received other than poll messages.
 - (b) Poll timeouts.
 - (c) Connection times.

Note: Records of other transmission events may be provided by FRNSW to the AFASP by prior agreement and may incur additional fees. See *Schedule of AFASP Fees and Charges (AFA-P-30)*.

11 Testing Fees

See *Schedule of AFASP Fees and Charges (AFA-P-30)*.

12 References

Identifier	Title
AFA-F-04	<i>AFA/ESCAD IP Communication System Interface Test Registration Form</i>
AFA-I-02	<i>Instruction No. 2: AFASP Manual Reporting of Alarm Calls and Communication System Failures</i>
AFA-P-05	<i>Testing an Applicant AFASP</i>
AFA-P-11	<i>Emergency Temporary AFASP Disconnection</i>
AFA-P-30	<i>Schedule of AFASP Fees and Charges</i>
AFA-S-01	<i>AFA/ESCAD IP Communication System Interface Specification</i>
AFA-S-03	<i>AFA/ESCAD IP Communication System Interface Specification: Appendix B: NSW</i>
	<i>AFASP Acceptance Test Procedure Script</i>