

**CODE OF PRACTICE
FOR THE MONITORING OF
PRIVATE FIRE ALARMS
AND SPRINKLER SYSTEMS**



CONTENTS

	Page
PURPOSE OF DOCUMENT _____	3
AIM _____	3
OBJECTIVES _____	3
FUNCTIONS _____	4
GLOSSARY OF TERMS AND ABBREVIATIONS _____	6
OPERATIONAL DESCRIPTION _____	8
MONITORING AND SERVICING _____	12
ADMINISTRATION _____	14
MISCELLANEOUS PERFORMANCE CRITERIA _____	16

PURPOSES OF DOCUMENT

1. The purposes of this code of practice are to:
 - (1) identify the aims and objectives of the New Zealand Fire Service in monitoring fire alarm and sprinkler systems; and
 - (2) set performance standards.

AIM

2. The Fire Service aims to encourage installation of fire alarms and sprinkler systems which are connected to the Fire Service.

OBJECTIVES

3. Fire Service objectives are to:
 - (1) provide a cost effective system;
 - (2) retain existing customers and attract new customers;
 - (3) maintain a national fee structure;
 - (4) avoid subsidising customers or organisations by absorbing costs;
 - (5) contract out invoicing and management functions;
 - (6) limit Fire Service response to fire calls only.

FUNCTIONS OF FIRE SERVICE CONTRACTOR

4. The function of the Fire Service Contractor is to manage, on behalf of the Fire Service, the alarm signal transport system (except aspects managed by the signal transport system manager). In particular the Fire Service Contractor is to:
- (1) monitor fire alarm signals, action "off normal" states and rectify faults;
 - (2) invoice customers for the monitoring service, the initial connection fees and any other charges initiated by the Fire Service;
 - (3) invoice customers as part of the total charge the cost element initiated by the signal transport system manager;
 - (4) manage the connection of fire alarms to the signal transport system including verification that the installation meets the appropriate New Zealand Standard(s) and the completion of a full commissioning test;
 - (5) ensure that the fire alarm receiving equipment for which the Fire Service Contractor is responsible is maintained using preventative maintenance techniques;
 - (6) ensure that equipment supplied for connection to the system meets the requirements of the system;
 - (7) ensure the provision of appropriate interface equipment to permit the connection of installed sprinkler and fire alarm systems to the signal transport system;
 - (8) provide the appropriate information and documentation to the Fire Service as required;
 - (9) maintain an accurate database, obtaining information from the Fire Service, signal transport system manager, customers and fire alarm agents as appropriate;
 - (10) liaise with the signal transport system manager, the Fire Service, customers and fire alarm agents as required to facilitate the efficient operation of the signal transport system and associated functions;
 - (11) on instruction from the Fire Service, issue warning letters and invoices to customers for Fire Service attendance to false alarm calls;
 - (12) comply with this code of practice.

FUNCTIONS OF THE SIGNAL TRANSPORT SYSTEM MANAGER

5. The functions of the signal transport system manager are to:
- (1) provide an alarm signal transport system that will ensure the rapid and accurate transmission of fire alarm and sprinkler system signals from the private fire alarm installation to the appropriate Fire Service Controlrooms and the Fire Service Contractor's management centre;
 - (2) manage and maintain all elements of the signal transport system;
 - (3) provide the Fire Service and Fire Service Contractor with management signals (i.e. fire alarm state, fire alarm connection status, and the operational status and identity of critical components and links within the signal transport system);
 - (4) maintain an accurate database, obtaining information from the Fire Service Contractor as necessary;
 - (5) liaise with the Fire Service and the Fire Service Contractor as required to facilitate the efficient operation of the signal transport system and associated functions;
 - (6) invoice the Fire Service for the use of the signal transport system, for customer connection fees and other agreed service provision fees as appropriate;
 - (7) comply with this code of practice.

FUNCTIONS OF THE FIRE SERVICE

6. The functions of the Fire Service are to:
- (1) monitor "FIRE" Signals and respond with the appropriate resources to those calls;
 - (2) monitor the frequency of false alarms and
 - (a) to advise the Fire Service Contractor when a cautionary letter, notification of pending disconnection, or disconnection of an alarm is required, and
 - (b) to forward any charges for attending such calls to the Fire Service Contractor for recovery from the customer;
 - (3) accept the connection of alarms and sprinkler systems when the appropriate documentation has been completed and supplied by the Fire Service Contractor to the Fire Service's satisfaction;
 - (4) advise the Fire Service Contractor of any faults concerning the signal transport system equipment located in or associated with Fire Service Controlrooms;
 - (5) liaise with the Fire Service Contractor and the signal transport system manager as necessary to facilitate the efficient operation of the signal transport system and associated functions;
 - (6) comply with this code of practice.

GLOSSARY OF TERMS, ABBREVIATIONS AND DEFINITIONS

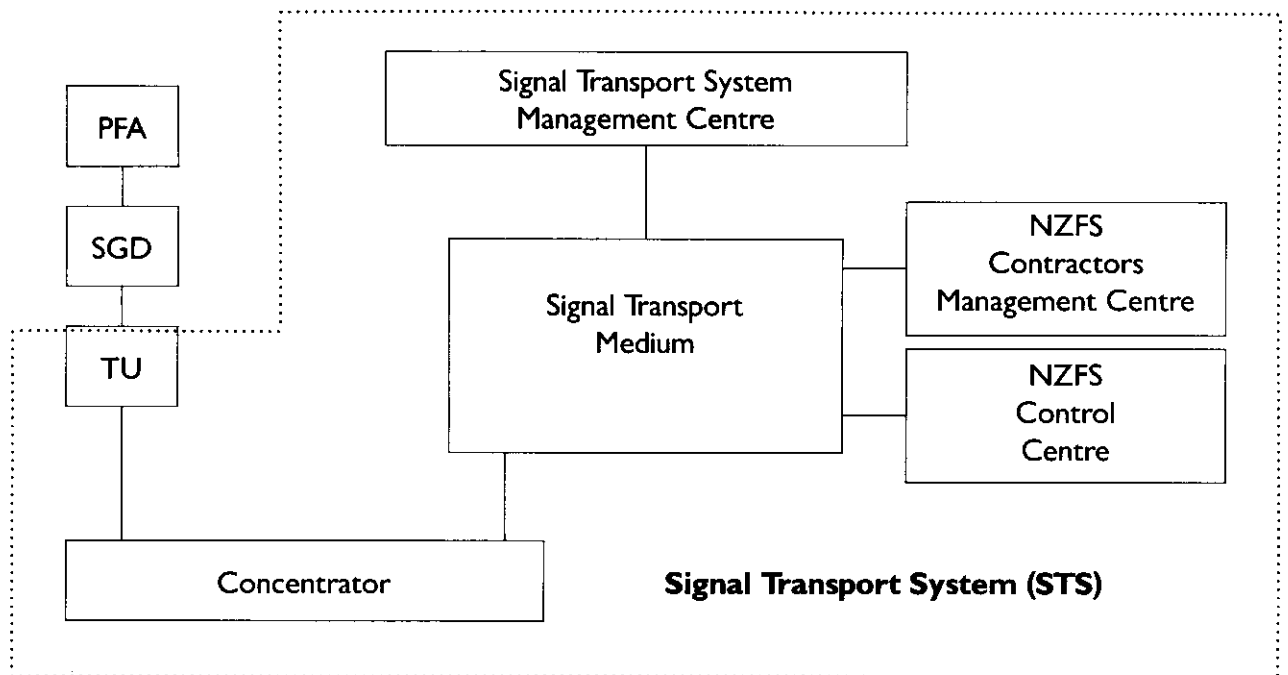
7. The following terms, when used in this Code of Practice have the meanings as described below:
- (1) **Alarm Agent (PFA Alarm Agent)**
The agent responsible for the testing and maintenance of a particular PFA (i.e. the company or person responsible for attending to the PFA in the event of an activation).
 - (2) **Certificate of Compliance**
A certificate of compliance is a written certification that the installation complies with the appropriate New Zealand Standard(s). The certificate is to be provided by the company responsible for the installation of a fire alarm or sprinkler system in a customer's building.
 - (3) **CRC (Cyclic Redundancy Check)**
An error checking code for data integrity.
 - (4) **NZS 4512**
New Zealand Standard 4512 1981 including amendments to July, 1990.
 - (5) **NZFS, Fire Service**
New Zealand Fire Service
 - (6) **NZFS Contractor**
The Company that will undertake the management and monitoring of fire alarm installations, action "Off Normal" states, invoice customers for appropriate fees and act as agent for the New Zealand Fire Service as contracted.
 - (7) **NZFS Contractor's Management Centre**
A site where the NZFS Contractor's management equipment and personnel are accommodated.
 - (8) **NZFS Controlroom, Controlroom**
A NZFS manned monitoring centre.
 - (9) **PFA**
A private fire alarm or sprinkler system meeting the appropriate New Zealand Standard(s).
 - (10) **PFA Customer, Customer**
The PFA owner, usually the building owner.
 - (11) **SGD (Signal Generating Device)**
A device that performs the interfacing function between the PFA system and the terminal unit. The function may be part of the PFA or the terminal unit.

- (12) **STS (Signal Transport System)**
The collection of equipment that is necessary to provide a signal path from PFA's to a NZFS Controlroom and the system management centre. This includes a TU at the customers premises, remotely located concentrating equipment, a medium to "transport" the signal, display equipment in the NZFS Controlroom and the system management centre to display and record an alarm actuation or system monitoring actuation.
- (13) **STS Manager**
The company that will undertake the supply and management of the STS.
- (14) **STS Management Centre**
The site where the STS is monitored and the specialised STS management equipment is accommodated.
- (15) **TU (Terminal Unit)**
A device to monitor and transmit the PFA signals to the remainder of the STS.
- (16) **Watchroom**
An unmanned communications room located at a fire station.

OPERATIONAL DESCRIPTION

8. The NZFS is to monitor the equipment located in Controlrooms that displays and records encoded PFA "FIRE" registrations on a VDU and registers all PFA state changes and STS management signals on an audit printer. All signals are to be automatically time and date stamped.
9. The NZFS Contractor is to be located in premises remote from the NZFS premises. The NZFS Contractor is to manage the STS including the testing of new PFA's, the responding to PFA alarm actuations, STS fault, defect actuations and the notification of Alarm Agents and STS service staff when appropriate. Furthermore, the NZFS Contractor is to be responsible for notifying Alarm Agents to attend to the PFA premises for post alarm actuation service, be it for fires or false alarms.
10. The primary signal path from the PFA to the NZFS alarm display equipment is to be a direct electronic path that does not require human intervention. Signal path redundancy is to be provided by a secondary signalling path from the concentration equipment nearest the TU to the NZFS Controlroom. The secondary signal path is to be a direct path not requiring human intervention in the same manner as the primary path.
11. System redundancy is to be provided by the automatic re-addressing of fire calls to a nominated Controlroom other than the Controlroom to which the calls would be addressed normally. The failure to initiate an acknowledgement signal from the Controlroom within thirty seconds of the transmission of a "FIRE" signal is to automatically generate the re-addressing of the signal to the secondary Controlroom.
12. Small systems, i.e. those with sixteen connections or less, are to remain connected to the local watchroom as is the current practice unless there are practical and economic reasons for connecting them to the signal transport system.
13. Service and maintenance of these small systems is to be the responsibility of NZFS. The NZFS Contractor is to service equipment from those small systems as required by the Fire Service at the NZFS Contractor's expense.
14. Under normal operation the STS is to display a fire alarm message at the NZFS Controlroom within fifteen seconds of activation of the PFA alarm output.
15. The STS is to provide an average operational reliability of not less than 99.7%. The STS manager is to advise the NZFS Contractor of all planned maintenance outages in advance. Where practicable, all outages are to be planned in consultation with the NZFS Contractor and the NZFS.

16. The STS is shown schematically in Figure 1 below.



(fig 1)

17. Each PFA is to be connected to an STS TU via an approved SGD. The TU is to communicate with the remote receiving equipment via an electronic link without intervention by non electronic means.
18. The TU is to be capable of receiving the following signals from each PFA connected to it: "FIRE", "defect", "isolate", "normal" and the composite test signals; "test/fire", "test/defect", "test/isolate" and "test/(normal)".
19. The TU is to be capable of transmitting an "equipment disconnect" signal.
20. The ability of the SGD to transmit a signal to the STS is not to be dependant upon the energy supply of the PFA.
21. Where the SGD cannot be powered from the TU, the SGD is to incorporate a separate power supply to ensure that a "FIRE" signal can be transmitted on the failure of the electrical supply to the PFA.
22. If the TU incorporates a microprocessor, the execution of its main programme flow is to be monitored by a device with an independent time base, not exceeding 100 seconds. In the event of an incorrect execution of software the monitoring device is to attempt to automatically restart the execution of the operating programme. Failure to restart the operating programme is to cause a fault signal to be generated.

23. Monitoring of the connection between a PFA and TU is required. Monitoring must be such that a short or open circuit is to be transmitted as a PFA connection fault. These connection faults must not be displayed as one of the signals listed in paragraph 18 above.
24. Concentration equipment is that part of the STS that combines signals from a number of TUs for onward transmission to a remote monitoring centre.
25. Concentration equipment may be cascaded. Failure of any input must not affect the transmission of any alarm signal from other inputs of the same piece of equipment.
26. TUs and Concentration equipment are to be powered from monitored uninterruptible energy supplies having sufficient capacity to sustain operation of the equipment, communication link interfaces and any transmission devices powered by them for a minimum of 24 hours in the event of a mains failure.
27. TUs and Concentration equipment are to incorporate an automatic testing facility whereby at intervals not exceeding forty eight (48) hours the energy supply is tested in such a manner as to detect failure of the battery in the interval between routine service tests.
28. All data necessary for the TU and concentrator functions is to be held in solid state memories. The operating programs are to be held in non volatile "read only" memory.
29. The STS is to incorporate queuing facilities to allow for the controlled automatic transmission of multiple events to the NZFS and NZFS Contractor. Prioritisation is to be included such that "FIRE" signals are transmitted before other events. If a queue within the STS becomes near full a unique fault signal is to be generated for display. From then on only "FIRE" signals and system events are to be inserted in the queue until the queue falls to a safe level.
30. The communication links specified as under are classified as primary links:
 - (1) the TU to the concentrator;
 - (2) the concentrator to the STS management centre;
 - (3) the STS management centre to the NZFS Controlroom;
 - (4) the STS management centre to the NZFS Contractor's management centre;
 - (5) the NZFS Contractors alarm receiving terminal and management computer.
31. Primary links are to be electronically established without intervention by non electronic means, continuously monitored and are to provide an average operational reliability of not less than 99.7%.
32. Failure of any section of the primary link must not cause a "FIRE" signal to be transmitted to the NZFS Controlroom or NZFS Contractor's management centre.
33. In the event of the failure of the primary signal path from the concentrator to the STS management centre, or a NZFS Controlroom, a secondary signalling path is to be provided as detailed in paragraph 10 above.

34. All primary communications link receiving devices are to employ error checking to a level not less than a sixteen bit CRC.
35. Communication links are to be monitored by the STS management centre and the NZFS Contractor's management centre as appropriate. A system alarm is to be generated on the occurrence of a link failure. Upon restoration of a failed communications link each unacknowledged event in store is to generate a new event.
36. The STS is to incorporate facilities to initialise the NZFS Contractor's database with the correct identity and current state of all PFAs known by the STS to be in an "off normal" condition.
37. The carriage of any information other than the PFA signals and system management information signals specified in this document is to not compromise the performance of the STS.
38. PFA signals at the NZFS Controlrooms are to be received on a VDU and a printer. The VDU and keyboard are to be located on an operator's console. The printer is to be located in the equipment room.
39. The STS management centre equipment and the NZFS Contractor's management centre equipment is to have sufficient redundancy to allow for a single unit failure.
40. Where a TU has more than sixteen PFA's connected to it then the TU is to be subject to the same redundancy requirements as a concentrator.
41. Equipment in NZFS Controlrooms, NZFS Contractor's management centres and STS management centres is to be powered as appropriate by a power supply capable of providing continued operation for a period of 25 hours after a mains failure. This should be tested at least monthly and monitored for readiness during standby hours.

MONITORING & SERVICING BY THE NZFS CONTRACTOR

42. The NZFS Contractor's terminal equipment is to display and record all PFA and STS "off normal" and "return to normal" states.
43. The STS is to feed all data information to the NZFS Contractor in the form of the 6 digit PFA code, the 32 character operational address, the time, the date and the state of the alarm installation.
44. The NZFS Contractor is to establish and maintain database facilities. As a minimum the following items of information are to be programmable for each PFA:
 - (1) the building owner's name, address and telephone number;
 - (2) the building name and address;
 - (3) the 32 character operational address;
 - (4) the customer's name, address and telephone number;
 - (5) the keyholders' names and telephone numbers;
 - (6) the name and telephone number of the Alarm Agent.
45. Recall facilities are to be included within the NZFS Contractor's database for each event type and for the last known condition of a particular PFA. This recall is to be printable.
46. The NZFS Contractor is to advise the Alarm Agent of the receipt of "FIRE" and "defect" signals immediately upon receipt.
47. The NZFS Contractor is to advise the Alarm Agent of any PFA remaining in an "isolate" condition at the end of a normal working day.
48. The NZFS Contractor is to advise the Alarm Agent of any "off normal" states immediately upon occurrence, re-advicing the Alarm Agent two hours later and at the end of each working day until the fault is rectified.
49. All connected PFAs are to have the capacity to generate test signals (see list in paragraph 18 above). The purpose of these signals is to enable Alarm Agents to confirm that the PFA is connected to the STS and that its signals can be successfully received by NZFS and NZFS Contractor's receiving centres. On receipt of a test signal by the NZFS and NZFS Contractor's terminal equipment, an automatic handshake signal is to be communicated back to the originating PFA where it is to operate a "test correct" indication.
50. All PFA test signals received by the NZFS and NZFS Contractor's terminal equipment are to be logged on audit facilities and the NZFS Contractor's VDU as appropriate.
51. If test signals are not removed manually at the PFA within 45 minutes of inception, the test is to time out automatically and regular signalling from the PFA is to be restored.

52. The Alarm Agent is to be responsible for ensuring that the tests are satisfactory and, if not, to take the appropriate corrective action.
53. The NZFS Contractor is to advise the alarm Agents of the result of tests as appropriate.
54. The NZFS Contractor is to be responsible for informing the PFA customer of any system failures that may affect the receipt of fire calls.
55. The NZFS Contractor is to be responsible for the service of fire alarm receiving modules for small station alarm receivers. These units are to be forwarded to the NZFS Contractor for service at the NZFS Contractor's expense, and returned to the NZFS expeditiously.
56. The NZFS Contractor is not responsible for peripheral equipment associated with the alarm receiving equipment not connected to the STS. The NZFS is to hold spare modules for service replacement.

ADMINISTRATION

57. The NZFS Contractor is to invoice all customers for fire alarm monitoring at a national rate to be fixed in consultation with the NZFS.
58. The NZFS Contractor is to invoice PFA owners for PFA generated false alarms upon receiving instructions to do so from the NZFS.
59. Prior to connection, any existing system is required to have had a current annual survey and an up-to-date monthly test record to allow immediate connection to the system, or alternatively, a certificate of compliance to the appropriate N.Z. Standard is to be obtained one month prior to connection.
60. When requested by the NZFS the NZFS Contractor is to provide statistics of fire alarms maintained by an applicant company.
61. Only fire alarm and sprinkler installations approved by the NZFS are to be connected to the STS and cause signals to be transmitted to NZFS Controlrooms.
62. Prior to commencing the installation of alarm or sprinkler systems the NZFS Contractor is to obtain approval of the panel location.
63. Prior to connection of an alarm or sprinkler system to the STS the NZFS Contractor is to:
 - (1) obtain NZFS approval for the alarm panel layout;
 - (2) provide the NZFS with a Certificate of Compliance issued by an approved body for the alarm installation;
 - (3) provide the NZFS with the PFA code number, the building owner's business address, name or names of keyholders to be advised of building damage and the name of a contact person to arrange building inspection for the purpose of preparing operational plans including access in the event of fire calls;
 - (4) advise the STS manager of the information identified in subparagraph 63(3) above and, in addition, the 32 character operational address which will be advised by the NZFS;
 - (5) arrange for the testing of the installation prior to NZFS acceptance at the NZFS Controlroom.

64. The NZFS Contractor is to advise the NZFS and STS management centre of any change of PFA customer or change of customer details.
65. The NZFS Contractor or the NZFS should not refuse to connect a PFA that complies with the approved standards provided the PFA has not been disconnected due to false alarm records or non payment of monitoring fees.
66. The NZFS Contractor may, on instruction from the NZFS, disconnect a PFA from the STS for:
- (1) non payment of monitoring fees;
 - (2) a breach of the Certificate of Compliance;
 - (3) failure to comply with relevant NZ Standards;
 - (4) failure to comply with requirements of connection agreement (FSC350/1992);
 - (5) a poor false alarm record.
67. Provided NZFS approval has been given to disconnect a PFA as in paragraph 66 above, the NZFS Contractor is to issue the customer a 10 days final notice, in writing, of the impending disconnection.

MISCELLANEOUS PERFORMANCE CRITERIA

68. The NZFS Contractor is to be responsible for ensuring that a response is made to all receiving equipment failures within one hour of notification of the failure.
69. The NZFS Contractor is to assess the impact of all STS failures as they occur, and immediately inform the NZFS of the projected consequences for connected PFAs. The NZFS Contractor is to ensure that the STS manager is aware of all STS failures, and that appropriate follow up action is taken by the STS manager to commence restoration of service within the time frame agreed between the STS manager and the NZFS.
70. The restoration of failed subscriber circuits is to be undertaken in consultation between the Alarm Agent and the STS manager during working hours or outside normal working hours if appropriate. The NZFS Contractor is to adjudicate if necessary.