

Determination No. 2005/64

Fire alarm provisions for alerting the Fire Service

1 THE MATTER TO BE DETERMINED

- 1.1 This is a determination under section 17 of the Building Act 1991 (“the Act”) as amended by section 424 of the Building Act 2004 made under due authorisation by me, John Gardiner, Determinations Manager, for and on behalf of the Chief Executive of that Department.
- 1.2 The matter for determination is a dispute about a fire alarm system’s provisions for alerting the Fire Service (“the alerting provisions”).
- 1.3 The question to be determined is whether the alerting provisions, which do not comply with the acceptable solution F7/AS1, comply with clause F7.3.3 of the building code (the First Schedule to the Building Regulations 1992).
- 1.4 No other aspects of the Act or of the building code have been considered in this determination.

2 THE PARTIES

- 2.1 The applicant is the owner of the building acting through a property consultant. The other parties are the territorial authority and the New Zealand Fire Service.

3 THE BUILDING AND THE FIRE ALARM SYSTEM

- 3.1 The two-storey building concerned has a supermarket, including retail, storage, and office areas on the ground and mezzanine floors, where storage space has been altered to become retail space. On the upper floor there are office tenancies, which have been altered.
- 3.2 Two building consents, specifying the following emergency warning systems, were issued in respect of alterations to the building:
 - (a) First floor alterations (C/AS1 Purpose Group WL):

The building consent specified a Type 3b automatic fire alarm system and “a means of communicating with the Fire Service as detailed in acceptable solution F7/AS1 clause 2.2.2(a) or 2.2.2(b)”.

A code compliance certificate has not been issued in respect of this building consent.

(b) Ground floor alterations (C/AS1 Purpose Group CM):

The building consent specified a Type 3f automatic fire alarm system and “compliance with acceptable solution F7/AS1 clause 2.2.2(c)”.

A code compliance certificate has been issued in respect of this building consent.

- 3.3 The fire alarm system as installed is a type 3 system but instead of complying with paragraph 2.2.2(a) or (b) of F7/AS1, the system is described as having “a proprietary alarm interface board linking the fire alarm panel to a radio data modem transmitting the relevant alarm status data via an established radio trunk network to a [security firm’s] monitoring station”.
- 3.4 As I understand it, the system covers the whole building so that the different requirements of the two building consents in respect of alerting the Fire Service are irrelevant and the alerting provisions apply to the system as a whole.
- 3.5 In effect, the security firm’s operator (“the off-site operator”) performs the same functions as would the switchboard operator (“the on-site operator”) under paragraph 2.2.2(b) of F7/AS1, namely:
- On activation of a “fire” signal: Alert the Fire Service by “111” telephone call.
 - On activation of a “defect” signal: Advise the owner’s service personnel.

4 THE BUILDING CODE AND THE APPROVED DOCUMENT

4.1 The relevant provision of the building code is:

F7.3.3 Appropriate means of warning for fire and other emergencies must be provided in buildings as necessary to satisfy the other performance requirements of this code.

4.2 The relevant provisions of the acceptable solution F7/AS1 are:

2.2 Alerting the Fire Service

2.2.1 Where an alarm system is required by Table 4.1 of Approved Document C/AS1, there shall be available a means of communication with the Fire Service.

2.2.2 The three means of communication are:

- a) A direct connection (approved by the Fire Service) between the alarm system and the Fire Service, or
- b) A “111” telephone call to the Fire Service from a continuously attended telephone with outside line access serving all buildings connected to the alarm system, and having the main fire alarm panel or mimic panel visible to the switchboard operator. A warning device shall be provided to alert the operator of a fire alarm in any building on the site (see Paragraph 2.2.3 for purpose groups SC or SD), or

- c) . . . a telephone (or telephone system) is installed within the building and readily accessible at all times to enable “111” calls to be made to the Fire Service.

5 THE SUBMISSIONS

5.1 General

- 5.1.1 Each of the parties made submissions. In addition, reports on the matter were obtained from two firms of consulting engineers (“consultants 1 and 2”). Those reports were copied to the parties.

5.2 The applicant’s submissions

- 5.2.1 The applicant contended that the alerting provisions are an alternative solution that “provides an equivalent level of assurance to the building owner as [paragraph 2.2.2(b) of F7/AS1]”.

- 5.2.2 The applicant supported that contention by submitting that:

“. . . continuous polling of the alarm interface [was carried out] at intervals of no less than 90 minutes. If a satisfactory test signal is not received when due then the system is programmed to raise an appropriate alarm at the monitoring station and a computerised call out response schedule will require that the building owner’s service representative is summoned to the site to investigate.

“Further, there is . . . an alerting device incorporated into the fire alarm system itself. This is effected by the fire panel indicating three states as required by NZS 4512 [Fire alarm systems in buildings] . . . viz ‘normal’, ‘fire’ and ‘defect’. When either of the latter two states is indicated the radio modem interface to be attached to the alarm panel automatically calls the monitoring station and the appropriate status signal is received.”

- 5.2.3 The security firm is “an established and reputable company holding all the necessary licenses in terms of the Private Investigators and Security Guards Act 1974”. The firm “has a 24 hour, 7 day per week operation using trained monitoring room staff on a rotating shift basis”.

- 5.2.4 All calls or signals received and responses made are recorded and available for inspection by the territorial authority.

- 5.2.5 Back-up facilities include:

- “a) dual redundancy computer networks
- “b) UPS [uninterruptible power supply] backed up computer network
- “c) emergency back-up diesel generator
- “d) back-up telephone lines from a second . . . telephone exchange
- “e) standby alarm receiving equipment
- “f) emergency . . . cellular phones [on two separate networks]
- “g) 8 hourly database back-ups”

5.3 The Fire Service

5.3.1 The Fire Service advised that it had “developed certain criteria regarding the type of alarm system that can be directly connected to the NZFS . . . in order to ensure that the alarm system does not generate unreasonable numbers of false alarms and is properly maintained so as to require the alarm system to comply with the relevant NZ standard and for the installation and maintenance of the system to be carried out by someone with accreditation to ISO 17929:1998 (AS/NZS 17020:2000).”

5.3.2 However, in this case it was claimed that the alternative solution was equivalent to a continuously attended telephone in accordance with paragraph 2.2.2(b) of F7/AS1, not to a direct connection to the Fire Service in accordance with paragraph 2.2.2(a). In that respect, the Fire Service submitted:

“Paragraph (b) is clearly explicit in referring to a switchboard operator being ‘on site’ to call 111 in the event of a fire. This on site presence is an important part of complying with the Code as it enables detailed information about the fire to be transmitted and ensures that false alarms are not given. Both these important facts are only able to be ascertained by a person who is actually on the site, it is impossible for a person monitoring the alarm from a remote location to do the same.”

5.3.3 The Fire Service also believed that the alerting provisions were “likely to generate increased false alarms”.

5.4 The territorial authority

5.4.1 The territorial authority compared the alerting provisions with the acceptable solution and identified three areas of concern:

(a) “It is unclear how alarms are brought to the attention of the [off-site operator].”

(b) “The reliability of the trunk radio network compared to a standard . . . phone system requires to be determined.”

(c) “. . . the initial response to an alarm activation may not be to call the NZFS.”

5.4.2 The territorial authority also said:

“An advantage of the alternative solution is that the [off-site operator] will respond to defect signals as well, where as the switchboard operator (requirement of the acceptable solution) may not. There appears no requirement . . . for the operator to take any action.”

5.4.3 The territorial authority was particularly concerned that the initial response to alarm activation might not be to call the Fire Service. The territorial authority said that “is a recognised failing of the use of remote monitoring companies” and cited a particular fire in which there had been a failure to alert the Fire Service.

5.4.4 The territorial authority said:

“. . . The [security firm] is a servant to the customer and is bound to act on the customer’s instructions. . . .

“A means to alleviate this concern is for the contract between the customer and the [security firm] to specify that any alarm signal received will be passed immediately to the NZFS. Additionally, the presence of the said clause could be a requirement of the compliance schedule that would require the IQP of the emergency warning system to validate the satisfaction of this requirement.”

5.5 Consultant 1

5.5.1 Consultant 1 noted that the system incorporated heat detectors and manual call points, neither of which typically create false alarm problems. The radio network concerned:

“... has been used successfully for a number of years by a variety of organisations including [national organisations concerned with ambulances and with civil defence]. It appears that there is sufficient reliability in the radio system used.”

5.5.2 Consultant 1 considered that the alerting provisions met the requirements of paragraph 2.2.2(b) of F7/AS1 and also have the additional features of regular checks that the fire alarm system is still functional and that “the monitoring radio modem also monitors the system for a defect signal, which may not occur with the switchboard operator concept”.

5.5.3 Consultant 1 recognised the need to ensure that the Fire Service is alerted immediately a fire alarm is received, but said:

“I do not believe that the [F7/AS1] switchboard operator provided with a display unit will be able to provide additional information about the fire alarm unless they do not immediately transmit the alarm.”

5.5.4 Accordingly, consultant 1 considered that the alerting provisions would comply with the clause F7 of the building code if appropriate terms as to alerting the Fire Service were included in the owner’s contract with the security firm and were included on the compliance schedule.

5.6 Consultant 2

5.6.1 Consultant 2 said:

“We consider that the underlying issue is reliability so as to ensure that a call to the brigade is effected to a level equal to, or better than that required under NZBC F7/AS1, 2.2.2b. . . .

“... it is our opinion that [the alerting provisions] will provide an equivalency to the acceptable solution provided that

- “• Continuous polling is required on the radio link between the alarm panel and the remote monitoring station. The 90 minute polling proposed does not provide sufficient supervision of the radio link. Reliability of the radio network needs to meet with the . . . 99.7% criteria required by the NZFS.
- “• Rigorous procedures, including assurance of 24 [hour] manned operation, as well as strict procedures to ensure that on receipt of a fire call the fire service are called immediately. [Consultant 2 cited two fires, different from the one cited by the territorial authority, in which there had been a failure to alert the Fire Service.]
- “• The use of well trained and competent staff. . .
- “• Reliable methods to initiate call to NZFS via preferably a [telephone] line otherwise, trunk radios, or back up cell phones”

5.7 The owner's responses

5.7.1 Response to the Fire Service's submissions

- 5.7.1.1 The owner said that F7/AS1 did not require the switchboard operator to delay contacting the Fire Service until he or she had checked that the alarm panel was not delivering a false signal. That would require the operator to leave the switchboard and perhaps go to another building.
- 5.7.1.2 "Once this possibility is discounted, it is apparent that there can be no significant difference between a fire alarm panel monitored by a continuously present on site switchboard operator and a fire alarm panel continuously monitored by a continuously present remote operator. . . . In many cases the alternative solution will be preferable given that the remote operator . . . will be trained and focused on the alarms being monitored whereas a switchboard operator will by definition have other duties to perform."

5.7.2 Response to the territorial authority's submissions

- 5.7.2.1 The owner saw the territorial authority's principal concerns as being:
- (a) Procedures for alerting the Fire Service, and
 - (b) The reliability of the radio network.
- 5.7.2.2 In response to those concerns, the owner submitted technical and corporate information about the security firm and the commercial mobile radio network used by the firm.

5.7.3 Response to the consultants' reports

- 5.7.3.1 As to ensuring that the Fire Service is called immediately on receipt of a fire alarm, the owner said that the matter was addressed in the information submitted about the security firm, but pointed out that there was no equivalent requirement in F7/AS1.
- 5.7.3.2 As to consultant 2's comments on continuous polling, there was no mention of polling in paragraph 2.2.2(b) of F7/AS1. In fact, the security firm polled at 60 minute intervals (not 90 as previously advised) which was considered adequate. "The probability of a fire breaking out between polls and the radio link also failing in the same period is considered remote."

5.8 The Fire Service response

- 5.8.1 The Fire Service recognised that the consultants' reports "suggested that the . . . [alerting provisions achieve] an equivalent standard to the acceptable solution subject to a number of provisions".
- 5.8.2 "The [Chief Executive of the Department of Building and Housing] would have to consider whether there are sufficient assurances that such provisions can be maintained, not only in the case of the [security firm] but also for any other monitoring company that might be used by this or a future building owner. . . ."

6 DISCUSSION

- 6.1 The only differences between the alerting provisions and the acceptable solution are:
- (a) There is an off-site operator instead of an on-site operator, and

- (b) Information as to signals on the fire alarm panel are transmitted to the off-site operator by way of a radio link instead of being directly visible to the on-site operator.
- 6.2 It is clearly an advantage if someone on-site can give detailed information about a fire to the Fire Service. However, that is not a requirement of F7/AS1 and an on-site operator cannot be relied on to provide such information in all cases.
- 6.3 There is no specific requirement in F7/AS1 for the on-site operator to alert the Fire Service immediately on receipt of a fire alarm, although it seems to be a reasonable implication. Accordingly, it is clearly desirable that the owner should not instruct the operator to delay alerting the Fire Service until satisfied that there is a genuine alarm (and therefore that the owner will not be charged for a Fire Service turn out to a false alarm). In the case of an off-site operator employed by the security firm, such instructions would be a matter of record if not specifically negated by contract, and therefore I consider that an off-site operator is less likely to receive such instructions than is an on-site operator.
- 6.4 The comparison between the alerting provisions and paragraph 2.2.2(b) of F7/AS1 therefore turns on the reliability with which signals on the fire alarm panel will be transmitted to the off-site operator by way of a radio link. That reliability must be comparable to the reliability that is achieved when such signals are directly visible to an on-site operator.
- 6.5 There was no suggestion that the radio network itself might be unreliable.
- 6.6 Nevertheless, there was concern about “polling”, which is taken to mean regularly testing to ensure that the alarm system was properly connected to the off-site operator by the radio link.
- 6.7 The 60-minute polling included in the alerting provisions does not ensure comparable reliability. That can be ensured only by some fail-safe mechanism that will alert the off-site operator immediately on any failure of the link.
- 6.8 To that end, the contract between the owner and the security firm will need to additionally specify that:
 - (a) The alerting provisions will include a fail-safe mechanism for ensuring the reliability of the link as discussed above.
 - (b) If the off-site operator is alerted to a failure in the link, a person will immediately proceed to the building and serve as an on-site operator until the link is restored.
 - (c) The security firm will comply with specified inspection, maintenance, and reporting procedures to ensure that the off-site operator is alerted immediately on any failure of the link.
- 6.9 Those procedures will need to be included in the compliance schedule, with at least an annual check by an independent qualified person as required by section 44 of the Act.
- 6.10 The compliance schedule will need to be approved and issued by the territorial authority in the usual way. In other words, the maintenance, inspecting, and reporting procedures will need to be to the satisfaction of the territorial authority. Any disputes may be submitted for a further determination.

7 DECISION

- 7.1 In accordance with section 20 of the Act, I hereby determine that the alerting provisions do not comply with the building code, but would comply if amended, to the satisfaction of the territorial authority, to include:
- (a) A fail-safe mechanism that will alert the off-site operator immediately on any failure of the radio link, and
 - (b) If the off-site operator is alerted to a failure in the link, a person will immediately proceed to the building and serve as an on-site operator until the link is restored.
 - (c) Maintenance, inspection, and reporting procedures to ensure that the alarm system continues to be properly connected to the off-site operator by the radio link, such procedures to be included in the compliance schedule for the building.
- 7.2 Accordingly, I hereby confirm the territorial authority's decision to refuse to issue the code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 5 May 2005.

John Gardiner
Determinations Manager