Australian Standard™

Hard-wired patient alarm systems

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PREFACE

This Standard was prepared by the Standards Australia Committee TE/16, Personal Alarm Systems.

This is the first Standard in a possible series of Standards which deals with the requirements for nurse call systems.

Patient alarm systems are a vital means of communication between patients and nurses in health care facilities. It is essential that a patient alarm system is reliable and easy to use by patients and staff who activate the alarm, and staff who respond to each alarm.

This Standard has been prepared at the request of suppliers, manufacturers and users of hard-wired patient alarm systems who have identified a number of substandard systems currently being marketed in Australia. Its application is intended to raise the quality of such systems to a level commensurate with their life-supporting function.

This Standard is intended for conventional hard-wired patient alarm systems. Other systems, such as telecommunications-based systems using telephone diallers or PABX equipment, or radio-based systems, are not covered.

This Standard is intended for use in establishments such as hospitals and nursing homes. It is recognized that some health care facilities may require more specialized specifications, but these are not precluded from adopting this Standard if they wish to specify the requirements of the systems described herein, and an appendix provides guidance on variations from this Standard, which may be applicable to low dependency care facilities.

To cater for other technologies and different establishments, a series of Standards to cover the requirements of the different types of patient alarm systems is under consideration. Standards being considered for the series include—

(a) non-hard-wired patient alarm systems; and

(b) patient alarm systems applicable to specialist health care facilities.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an informative appendix is only for information and guidance.
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STANDARDS AUSTRALIA

Australian Standard

Hard-wired patient alarm systems

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies the minimum performance requirements for conventional hard-wired patient alarm systems. It does not apply to telecommunications-based systems using telephone diallers or PABX equipment or to non-hard-wired systems. Appendix A provides requirements for additional features.

NOTE: The requirements for telecommunications-based 24 h monitored systems are given in AS 2999.

1.2 APPLICATION This Standard applies to patient alarm systems installed in high dependency health care establishments as defined in Clause 1.5. It may also apply to specialist establishments such as aged-care facilities and hostels.

NOTE: Variations from this Standard, which may apply to low dependency care facilities, are given in Appendix B.

1.3 INNOVATION It is not intended that this Standard impose unnecessary restrictions on the use of new or unusual materials or methods, providing that all of the performance requirements of this Standard are maintained.

1.4 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
1102 Graphical symbols for electrotechnology (all parts)
1125 Conductors in insulated electric cables and flexible cords
1828 Electrical equipment for explosive atmospheres—Cable glands
1939 Degrees of protection provided by enclosures for electrical equipment (IP Code)
2380 Electrical equipment for explosive atmospheres—Explosion protection techniques (all parts)
2999 Alarm systems for the elderly and other persons at risk
3000 Electrical installations—Buildings, structures and premises (known as the SAA Wiring Rules)
3003 Electrical installations—Patient treatment areas of hospitals and medical and dental practices
3147 Approval and test specification—Electric cables—Thermoplastic insulated—For working voltages up to and including 0.6/1 kV

AS/NZS
2176 Primary batteries
2176.1 Part 1: General
2176.2 Part 2: Specification sheets
3009 Electrical installations—Emergency power supplies in hospitals

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AS/NZS
3191 Approval and test specification—Electric flexible cords
3200 Approval and test specification—Medical electrical equipment—General requirements for safety
3200.1.2 Part 1.2: Collateral Standard: Electromagnetic compatibility—Requirements and tests
3260 Approval and test specification—Safety of information technology equipment including electrical business equipment
4251 Electromagnetic compatibility—Generic emission standard
4251.1 Part 1: Residential, commercial and light industry
4383 Preparation of documents used in electrotechnology
4383.1 Part 1: General requirements
4383.2 Part 2: Function-oriented diagrams
4383.3 Part 3: Connection diagrams, tables and lists

1.5 DEFINITIONS For the purpose of this Standard the definitions given below apply.

1.5.1 Annunciator—a means, audible or visual, or both, of indicating the type and location of a call.

1.5.2 Bed call—a patient call activated from a bed unit.

1.5.3 Bed unit—the space dedicated to a patient which includes all the features necessary for the well being of that patient.

1.5.4 Call panel—a fixture from which a call can be initiated.

1.5.5 Competent person—a person who has acquired through training, qualification or experience, or a combination of these, the knowledge and skills enabling that person to perform the task required by this Standard.

1.5.6 Cord out call—a call activated by unplugging a call cord.

1.5.7 Corridor indicator—a readily discernible visual means located on a ceiling or wall outside a room indicating the type of call from that room.

1.5.8 Diagnostic call—a call activated by the interruption of supply from a health care machine.

1.5.9 Duress alarm—personal security call for staff.

1.5.10 Emergency call—the highest priority call.

1.5.11 High dependency care—care such as that provided in hospitals, nursing homes, and day surgeries.

1.5.12 Logbook—Any system, including electronic means, used to itemize and record routine maintenance procedures for the upkeep of the patient alarm system.

1.5.13 Low dependency care—care such as that provided in aged-care establishments, retirement villages and group housing.

1.5.14 May—indicates an option.

1.5.15 Non-captive—feature of an electrical device which means it becomes disconnected from the power supply once a horizontal force is applied to it.

1.5.16 Nurse presence—an indication that a nurse is in attendance.

1.5.17 Nurse station—staff coordination and communication area.
1.5.18 Patient alarm system—patient/staff communication system within a care facility.

1.5.19 Patient call—a call activated by the patient.

1.5.20 Reassurance lamp—visual indicator located on the patient call originating point which lights up once a call has been activated from that point.

1.5.21 Shall—indicates a statement that is mandatory.

1.5.22 Should—indicates a recommendation.

1.5.23 Staff assist—a call activated by a member of staff to alert other members of staff that assistance is required.

1.5.24 Staff presence—an indication that non-nursing staff are in attendance.

1.5.25 System—the patient alarm system (see Clause 1.5.18).

1.5.26 System terminal—a staff communication device normally located at the nurse station or a remote staff area.

1.5.27 Wet area call—a patient call activated from a bathroom, ensuite, toilet or shower.
SECTION 2 PLANNING

2.1 GENERAL Planning an appropriate patient alarm system should commence as early as practicable in the development of a project which may require such a system.

In the initial stage of planning, the planner should consult with the user’s representatives and manufacturers or suppliers to establish the appropriate type of system required. Further planning should include consultation with users’ representatives, manufacturers or suppliers and their installers, architects, developers, and electrical contractors and communications contractors, as applicable.

NOTE: It is strongly recommended that hard-wired patient alarm systems are installed as part of a communications system package.

2.2 INDEPENDENCE For its correct operation, a hard-wired patient alarm system should be treated independently without the necessity for reliance on any other system such as a building management system bus.

2.3 CONSIDERATIONS Planning considerations for a hard-wired patient alarm system shall include, but shall not necessarily be limited to, the following:

(a) Location of indicators.
(b) Location of call panels.
(c) Pull cords in wet areas.
(d) Ability of the patient alarm system to comply with any quality assurance program which may be established.
(e) Operational requirements from the user.
(f) End-user training.
(g) Optional features.
SECTION 3 PERFORMANCE REQUIREMENTS

3.1 GENERAL The patient alarm system shall consist of the following components:
(a) Patient alarm call point with reassurance lamp at the bed unit.
(b) Patient alarm call point with reassurance lamp in the wet areas.
(c) Staff assist button with reassurance lamp.
(d) Emergency button(s) with reassurance lamp.
(e) Cord out alarm with reassurance lamp.
(f) Cancel button.
(g) Corridor indicator.

NOTES:
1 The system may include other features such as system terminal, diagnostic alarm, annunciators and nurse presence buttons in general ward areas.
2 Variations which may apply to low dependency care facilities are given in Appendix B.

3.2 ALARM RESPONSE

3.2.1 General When the patient alarm system is activated it shall produce a visible and audible indication of the type and location of call, which shall register at the corridor indicator and other staff areas as necessary.

The audible and visual indicators shall be readily identifiable from other systems such as telephones and fire alarms.

The audible indicator shall not be capable of being turned off completely.

NOTE: The volume of the audible indicator may be varied.

Emergency calls may interface with the hospital paging system.

Except where allowed in Appendix A, calls shall only be cancelled at the point of origin. Alarms shall continue to register until manually cancelled at the point of origin.

3.2.2 Response signals The patient alarm system shall incorporate the alarm indicators shown in Table 3.2.2, as applicable. The audible alarm shall be within the frequency band of 400 Hz and 3 kHz.

3.3 CALL PANELS

3.3.1 General Call panels should be light coloured. Call panels should be constructed in modules of minimum size of one gang electrical switch plate.

3.3.2 Patient call panels The patient call panel shall not incorporate the emergency button.

Where a patient call panel is constructed in module(s), the module(s) shall incorporate a maximum of three functions, one of which shall be a standard connecting jack.
### TABLE 3.2.2
ALARM INDICATORS

<table>
<thead>
<tr>
<th>Type of call</th>
<th>Corridor indicator colour</th>
<th>Audible tone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Period and frequency</strong></td>
</tr>
<tr>
<td>Patient—bed</td>
<td>Yellow or white, steady</td>
<td></td>
</tr>
<tr>
<td>Patient—wet area</td>
<td>Yellow or white, steady</td>
<td></td>
</tr>
<tr>
<td>Staff assist</td>
<td>Yellow or white, flashing</td>
<td></td>
</tr>
<tr>
<td>Emergency</td>
<td>Red, flashing</td>
<td></td>
</tr>
</tbody>
</table>

**Pulse repetition period = 1 Hz**
Maximum pulse decay time constant = 1 Hz

| Cord out                | As type of call           | As type of call                              | As type of call                              |
|                        |                           |                                               |                                               |
| Nurse presence (option) | Green                     |                                               |                                               |
| Diagnostic (option)     | Yellow or white, steady   |                                               | Slowly repeating single chime until reset     |
| Duress (option)         | See Note 1                | See Note 1                                   | See Note 1                                   |

**NOTES:**

1. The duress call should not produce any obvious indication of being activated at its source. It should register at the nurse station annunciator panel and the security desk.
2. For systems incorporating pagers, toners may not be necessary.
3.4 BUTTONS

3.4.1 General Except where allowed in Appendix A, all functions of the patient alarm system shall have their own dedicated button.

The buttons specified in Clause 3.1 shall have a readily identifiable reassurance light which lights up once the function has been initiated.

Buttons shall be at least 15 mm across their diagonal plan and arranged so that they are at least 10 mm away from adjacent buttons.

They shall be constructed so they can be cleaned without compromising their design function or becoming hazardous.

3.4.2 Bed call button The bed call button shall be located within easy reach of the patient. Where a handset is used, it shall be double insulated and capable of withstanding low voltage in accordance with AS 3000 or AS 3003.

3.4.3 Wet area call buttons Buttons installed in wet areas shall be double insulated and shall be capable of withstanding low voltage in accordance with AS 3000 or AS/NZS 3260. Buttons shall meet the requirements of IP65 as specified in AS 1939. See Clause 3.8.3 for the requirements for pull cords used in wet areas.

3.4.4 Emergency button The emergency button shall be located on a separate call panel dedicated exclusively for its use. It shall be located in a position that will preclude its accidental use.

3.4.5 Cancel button The cancel button shall be in the same panel or in the same room as the call button.

3.4.6 Identification The colours of the buttons shall be as shown in Table 3.4.6.

Buttons should be identified by the symbols or marking shown in Table 3.4.6.

For people with visual difficulties, the patient call button shall be readily identified by braille or by being embossed or engraved with the symbols in Table 3.4.6 in a contrasting colour.

3.4.7 Backlighting Backlighting may be provided at call points.

<table>
<thead>
<tr>
<th>Function</th>
<th>Colour</th>
<th>Symbol/Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient call</td>
<td>Green</td>
<td>Silhouette</td>
</tr>
<tr>
<td>Staff assist</td>
<td>Yellow or white</td>
<td>Staff</td>
</tr>
<tr>
<td>Emergency</td>
<td>Red</td>
<td>Emergency</td>
</tr>
<tr>
<td>Nurse presence</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Cancel</td>
<td>Grey</td>
<td></td>
</tr>
</tbody>
</table>

3.5 PENDANTS

3.5.1 General Pendant cords shall be double insulated and capable of withstanding low voltage in accordance with AS 3000 or AS 3003. They shall be non-captive and at least 2 m in length, and shall plug into the patient call panel.
3.5.2 Construction Movable parts of the system shall be connected by conductors having a resistance to fracture, under the circumstances in which the system is used, not less than that provided by the following conductors:

(a) Stranded construction Conductors that are of stranded construction shall comply with AS 1125 and shall have a total cross-sectional area of not less than 0.5 mm² composed of at least 16 strands of annealed high conductivity oxygen-free copper. They shall be covered with insulation not inferior to PVC complying with the requirements for Grade V-75 of AS/NZS 3191 and having a minimum nominal radial thickness of 0.4 mm.

(b) Tinsel construction Conductors that are of tinsel construction shall consist of two or more cadmium-copper tapes evenly lapped on a suitable core of natural or synthetic fibre. The nominal diameter of the tinsel conductor shall be not less than 0.75 mm, and it shall have a maximum resistance of 1.1 Ω at 20°C and a minimum breaking load not less than 89 N. The laid-up conductor shall be covered with PVC insulation complying generally with the requirements for Grade V-75 of AS 3147 and having a nominal radial thickness of at least 0.18 mm.

NOTE: This Clause does not preclude the use of other flexible conductors such as printed circuit boards and flexible ribbon cable, provided that they comply with the service requirements of Items (a) and (b) above.

3.6 CORRIDOR INDICATOR LIGHTS The corridor indicator lights shall be capable of being perceived correctly from 10 m.

3.7 AUDIBLE SIGNAL Except where allowed in Appendix A, Paragraph A3, the audible signal from patient calls shall only be capable of being turned off at the point of origin.

3.8 WET AREAS

3.8.1 General The wet area call function shall have sufficient activation points within easy reach from the bath/shower and the toilet.

3.8.2 Indicators For rooms with only one bathroom, where a bed call is differentiated from a wet area call by the corridor indicator, no other indicator shall be required. Where they are not differentiated by the corridor indicator, an indicator shall be placed outside the bathroom door.

Rooms with more than one bathroom shall have separate indicator lights outside each door.

3.8.3 Pull cords Where pull cords are installed in wet areas, they should be fitted with a weak link within 50 mm of the switch and designed to break on the application of a 10 kg mass. A pull cord shall be momentary and subsequent pulling of the pull cord shall not cancel the call until the function has been reset.

Wall-mounted pull cords shall meet the requirements of IP65 as specified in AS 1939.

3.9 SYSTEM FAILURE The patient alarm system's visual and audible systems shall continue to operate in the event of the main data bus failing.

Operating parameters shall be loaded in a non-volatile memory to ensure that in the event of a power failure the system shall repower without the loss of any information. See Clause 4.2.3 for the requirements for battery back-up.

NOTE: Variations which may apply to low dependency care facilities are given in Appendix B.
3.10 ADDITIONAL FEATURES The system shall incorporate the following features:

(a) The call point at the bed unit shall be electrostatic discharge hardened to a minimum of 10 kV, as specified in AS/NZS 3200.1.2.

(b) The system shall allow for any call point, reassurance lamp or corridor indicator to be removed and replaced without the need to switch off the entire system.

3.11 ENVIRONMENT

3.11.1 Ambient conditions Equipment shall be capable of operation under the following conditions:

(a) Ambient temperature range ............................................................ 0°C to +50°C.

(b) Relative humidity ................................................................. 20% to 90% (non-condensing) at 30°C.

3.11.2 Special environment conditions If any equipment and wiring is located in a position where it is, or may be, exposed to dampness, corrosion or other special conditions, the design and construction shall ensure that the reliability of the system is not prejudiced by such a condition. In particular, any equipment mounted externally to a building shall be of a type complying with AS 1939, with degree of protection IP 53.

Any equipment installed where flammable or explosive gas may be present under normal conditions shall comply with the requirements of AS 3000 and with other appropriate Standard(s) for equipment for use in such hazardous locations.

NOTE: AS 3000 may require equipment installed in hazardous locations to comply with other relevant Standards, e.g. AS 2380 (any part) and AS 1828.

3.12 EMC COMPATIBILITY Electronic equipment shall meet the emission requirements for commercial purposes specified in AS/NZS 4251.1.
SECTION 4 INSTALLATION

4.1 GENERAL The patient alarm system is crucial to the wellbeing of its users and it is, therefore, essential that it functions as designed at all times.

Hard-wired patient alarm systems should be designed as part of the hospital's communications system and should form part of the communications contract.

The system should be installed and supervised only by an installer approved by the manufacturer or the manufacturer’s representative.

4.2 ELECTRICAL EQUIPMENT

4.2.1 General The patient alarm system shall be connected to the hospital's essential power supply in accordance with AS/NZS 3009.

All electrical equipment used in the system shall comply with the requirements of AS 3000. In addition, electrical equipment used directly by patients or hospital staff, e.g. bed-call button and call points, shall be certified for use in patient locations defined in AS 3003 as body or cardiac protected.

4.2.2 Mains supply isolation/indication For mains supply isolation/indication, either of the following provisions shall be made:

(a) Where the mains supply is connected by means of a flexible cord in accordance with AS 3191 to a switched general-purpose outlet (GPO) located inside or adjacent to control equipment such as the nurse console or central computer, no further isolating switch is required.

(b) Where the mains supply, e.g. 240 V a.c., enters the control equipment unswitched, the following shall be provided:

(i) A 'mains-on' indicator, preferably located on the external face of the equipment enclosure.

(ii) A double-pole isolating switch, suitably labelled, located within the enclosure in a readily accessible position.

NOTE: Where an external step-down transformer is used to deliver extra-low voltage to the supply equipment, e.g. plug packs, no further isolation or indication is required.

4.2.3 Battery requirements Batteries shall be installed in accordance with the manufacturer’s recommendations.

Battery back-up shall be sufficient to provide a minimum of 10 min operation with the capacity to supply an additional 50% of the power requirements with 25% of the loops operative.

Rechargeable batteries shall conform with the appropriate Standard and non-rechargeable batteries shall conform with the appropriate part of AS/NZS 2176.

Rechargeable batteries shall be capable of being fully recharged from a fully discharged condition within 24 h.

NOTES:
1 A list of Standards relating to batteries and battery chargers is given in Appendix C.
2 See Appendix B for variations for low dependency care facilities.

4.2.4 Battery marking Each battery container shall be legibly and durably marked with the month and year of installations, e.g. 1/98 meaning January 1998.
4.2.5 Mains supply  Equipment operating from a main supply shall be installed in accordance with the requirements of AS 3000 or, in the event of such requirements being superseded by those of the relevant supply authority, in accordance with the requirements of such authority.

4.3 WIRING  Any circuit wiring incorporated in the patient alarm system shall be installed and connected in accordance with the following:
(a) AS 3000.
(b) Requirements of the Australian Communications Authority’s Technical Standards.
(c) Any additional requirements of the relevant energy supply authority.
(d) Manufacturer’s instructions.

The type of wiring shall be such that it is not adversely affected by environmental conditions to which it may be exposed, e.g. corrosion, heat, weather, mechanical damage, fumes and the like.

The cables for the system should be readily distinguishable from other cables.

The cables for the system shall be installed in accordance with AS 3000. Extra low voltage cables shall be multistranded.

Where jointings and terminations are required, they should be mechanically and electrically sound.

NOTE: Splicing should be avoided during installation.

4.4 CORRIDOR INDICATOR LIGHTS  Corridor indicator lights should be located so that an unobstructed view of them is possible from any point within the central circulation system. If this is impracticable, zone lights or other annunciators should be provided.

4.5 AUDIBLE SIGNALLING DEVICES  The audible signalling devices should be located in commonly used areas such as cleaning utilities, lounges, staff rooms and other areas where staff congregate.
SECTION 5 COMMISSIONING AND TRAINING

5.1 GENERAL Commissioning of the patient alarm system shall be in accordance with the manufacturer’s instructions and should include testing of all aspects to ensure the system is functioning as specified and as intended. Commissioning should also include verification that all wiring is correctly terminated and that the system continues to work on its internal battery back-up system.

5.2 INSTALLATION RECORD An initial record of equipment and system configuration shall be furnished to the client and a copy supplied to the health care facility management, as applicable, upon completion of commissioning to form a complete record of the system’s installed condition, as part of the operating and maintenance manual. The record shall include but shall not necessarily be limited to the following:

(a) The address and an outline plan of the health care facility.
(b) The position and type of each component of the patient alarm system.
(c) Installation, description and wiring diagram.

Symbols included in wiring diagrams and equipment descriptions and locations should comply with the relevant requirements of AS 1102 and AS/NZS 4383.1, AS/NZS 4383.2 and AS/NZS 4383.3.

5.3 HANOVER At handover, the manufacturer or the manufacturer’s representative shall—

(a) provide a fully completed installation record in accordance with Clause 5.2;
(b) provide the client with an adequate operating and maintenance manual typed in plain English and covering the entire patient alarm system as installed (refer to Clause 5.2);
(c) provide a system logbook to the client and explain the procedure for reporting and recording any problems encountered;
(d) demonstrate all aspects of the system operation to the client, including any necessary safety precautions;
(e) ensure that the end users know the procedure for summoning assistance in the event of system malfunction; and
(f) train the system end users in accordance with Clause 5.4.

5.4 END-USER TRAINING The manufacturer or the manufacturer’s representative shall provide a training package to the client which shall incorporate the briefing and training of staff on the operation of the patient alarm system.
SECTION 6 MAINTENANCE RECORDS AND REPORTS

6.1 GENERAL It is advisable that maintenance of the patient alarm system should be carried out by the manufacturer or the manufacturer’s representative in accordance with manufacturer’s recommendations.

6.2 MAINTENANCE

6.2.1 General Clauses 6.2 and 6.3 outline the minimum requirements for any maintenance agreement between the client and the manufacturer or the manufacturer’s representative.

6.2.2 Routine maintenance

6.2.2.1 General Routine maintenance visits to the hospital shall be made by an authorized representative of the system’s manufacturer at a minimum rate of once per year, with no more than 13 months between visits.

The representative shall be authorized by the health care facility administration prior to commencing company business.

6.2.2.2 Procedure During each routine visit, the following procedure shall be carried out:

(a) Check the satisfactory operation of all system components including testing the operation of each audible and visible indicator.

(b) Check the normal and internal standby power supplies for correct functioning.

NOTE: Batteries should be changed in accordance with manufacturer’s recommendations.

(c) Obtain the signature of the client or the client’s authorized representative on the maintenance visit record.

Where possible, rectifications shall be carried out at the time of the routine maintenance visit. All items of rectification shall be completed within a period of 21 days.

6.2.3 Emergency maintenance The manufacturer or the manufacturer’s representative shall appoint a company which is capable of responding within 4 h to all reasonable emergency maintenance requests from the client. The client shall be kept informed at all times of the current telephone number and address of that company. The emergency service shall be organized so that the time taken for its representative to attend the hospital after notification of a fault shall, under normal circumstances, not exceed 24 h. Where this time is likely to be exceeded due to extraordinary conditions beyond the control of the emergency service, or due to geographical location, the client shall be notified of the delay.

6.3 RECORDS

6.3.1 Responsibility The manufacturer or its representative shall maintain complete and accurate records relating to each of its patient alarm systems relevant to the maintenance agreement, including all items specified in Clauses 6.3.2 to 6.3.4 inclusive.

6.3.2 Ongoing maintenance record For each health care facility there shall be a historical record retained by the health care facility and maintained and retained by the manufacturer or its representative. The record shall be made available to the relevant regulatory authorities on the client’s request.
The record shall indicate every routine maintenance and emergency call to the health care facility and shall include the following:

(a) The date and time of every visit, the faults found, the action taken to correct the faults and, if possible, their cause.

(b) Details of any work left outstanding after a maintenance visit or of any system component which is not operating correctly and cannot be immediately rectified, and the action required to render such component operational.

(c) Any instance where it is necessary to temporarily disconnect, bridge or remove a device together with the reason, and the name and signature, if practicable, of the person authorizing such action.

(d) Any amendments to the installation or wiring diagrams.

The record shall be signed by the client, who shall be given a copy.

The record shall be kept in such a form that the history of a particular health care facility is readily available. Records of events shall be retained for a minimum period of 7 years or until the system is removed.

6.3.3 Authority for disconnecting  A device shall not be disconnected, bridged or removed without the authorization of the client.

6.3.4 Client’s logbook  Where a logbook is required by the client, it shall be issued to the hospital’s engineer or nominated technical maintenance person. It shall be available to authorized maintenance staff for the purpose of recording all visits, regular testing by the client and regular maintenance by the representative of the manufacturer or its representative.

The logbook shall itemize—

(a) those items to be regularly tested by the client;

(b) the date and time of any relevant activities; and

(c) the list of items to be checked by the manufacturer or its representative during regular maintenance visits.

The manufacturer or its representative shall sign the check list after each regular maintenance visit to indicate that every item has been checked and the client shall also sign the check list to verify that the regular maintenance has been carried out.

All isolations due to faults shall be recorded in the logbook.

6.4 SPARE PARTS  The manufacturer shall maintain a supply of available spare parts for a period of 10 years after the installation of the patient alarm system. The manufacturer or its agent shall have sufficient spare parts available for overnight delivery to the hospital.

The client should have spare parts as recommended by the manufacturer.
APPENDIX A
OPTIONAL FEATURES
(Normative)

A1 GENERAL This Appendix specifies requirements for optional features which are additional to a standard hard-wired patient alarm system.

A2 DURESS ALARM The patient alarm system may incorporate a duress alarm. The duress alarm should be linked to the hospital security system so that when it is engaged it alerts a trained security officer.

The duress alarm should not result in an obvious acknowledgment of activation at the point of activation.

It should be readily accessible from all locations within the hospital.

A3 SPEECH FACILITY Where a speech facility is installed, it shall meet the following requirements:

(a) If a speech-only system is installed, a patient call may be cancelled from the nurse station. However, systems with speech facility, which have the ability to cancel a call from the nurse station, shall have the capability to override it, i.e. requiring calls to be responded to in person.

(b) While the speech facility is in use, other calls shall be queued and not lost.

(c) Once activated, the call shall automatically switch off any audio device, such as TV or radio, on the handset from which the call was activated.

(d) The speech facility shall not negate the requirements for visible and audible alarms.

A4 ANNUNCIATORS Where annunciators are installed as part of the patient call system, they shall meet the following requirements:

(a) Calls shall be prioritized and the highest priority call shall be the only one to sound on the associated annunciators. The hierarchy of priority shall be in the decreasing order of—

(i) emergency call;

(ii) staff assist call;

(iii) bath call; and

(iv) bed call.

(b) The information on the annunciator shall be clearly visible within the local circulation area or from the nearest nurse station.

(c) The volume of the audible alarm may be varied but the sound shall not be capable of being turned off completely.

A5 NURSE PRESENCE A system that includes nurse presence shall have separate buttons and dedicated corridor indicators. For bed units that have individual nurse presence, activation of this may cancel a patient call. It shall not be possible to cancel a wet area call by the application of the nurse presence button.

NOTE: Nurse presence may assist hospital management in fulfilling its occupational health and safety obligations.
A6 CONSOLES Where consoles are installed, they shall include the following features:

(a) Calls shall be prioritized. The hierarchy of priority shall be in the decreasing order of—

(i) emergency call;
(ii) staff assist call;
(iii) wet area call; and
(iv) bed call.

(b) The highest priority tone shall be the only one that sounds.

A7 HANDSETS A bed call button may be incorporated on a handset, which may also incorporate controls for other systems such as a TV remote control. The handset shall be connected to the call panel via a pendant cord, which shall terminate in a non-captive plug-and-socket arrangement. The pendant cord shall be a minimum of 2 m in length. Where additional features are included on a handset, they shall not interfere with the patient alarm system.
APPENDIX B

VARIATIONS FOR LOW DEPENDENCY CARE FACILITIES

(Informative)

Patient alarm systems installed in low dependency care facilities typically differ from those in high dependency care facilities in that an alarm transmits to a central point without corridor indication and there is usually only call and cancel buttons at the bed unit. As such, the following variations to this Standard may apply to patient alarm systems installed in low dependency care establishments:

(a) **Clause 3.1** Items (d) and (g) are optional.

(b) **Clause 3.8.2** This Clause is optional.

(c) **Clause 3.9** This Clause only applies where corridor indicator lights are incorporated in the system. For patient alarm systems installed in low dependency care facilities, fault recognition is more important. Such systems should incorporate a test that simulates a button being activated at least once every four hours. This should be monitored by the central processor and if the test does not register, an alarm situation should be generated.

(d) **Clause 4.2.3** This is an optional Clause but, where it is chosen, the battery life should be a minimum of 4 h.
APPENDIX C
STANDARDS RELATING TO BATTERIES AND BATTERY CHARGERS
(Normative)

A1 BATTERIES

A1.1 Galvanic cells and batteries

AS
4086 Secondary batteries for use with stand-alone power systems
4086.1 Part 1: General requirements

A1.2 Primary cells and batteries

AS/NZS
2176 Primary batteries
2176.1 Part 1: General
2176.2 Part 2: Specification sheets

A1.3 Acid secondary cells and batteries

AS
2149 Starter batteries—Lead-acid
2191 Stationary batteries of the lead-acid Plante positive plate type
2402 Traction batteries—Lead-acid
2668 Water for use in secondary batteries
2676 Guide to the installation, maintenance, testing and replacement of secondary batteries in buildings
2676.1 Part 1: Vented cells
2676.2 Part 2: Sealed cells
3011 Electrical installations—Secondary batteries installed in buildings
3011.1 Part 1: Vented cells
3011.2 Part 2: Sealed cells
4029 Stationary batteries—Lead-acid
4029.1 Part 1: Vented type
4029.2 Part 2: Valve-regulated sealed type
4029.3 Part 3: Pure lead positive pasted plate type

A1.4 Alkaline secondary cells and batteries

AS
3731 Stationary batteries—Nickel-cadmium
3731.1 Part 1: Vented type
3731.2 Part 2: Valve-regulated type

A1.5 Miscellaneous

AS
2562 Hydrometers—Portable syringe-type for lead-acid batteries
3015 Electrical installations—Extra-low voltage d.c. power supplies within public telecommunications networks
A2 BATTERY CHARGERS

AS
2401 Battery chargers for lead-acid batteries—Domestic type
2401.1 Part 1: Battery chargers for vented cells
2548 Battery charges for lead-acid traction batteries—Performance requirements
2548.1 Part 1: Battery chargers for vented cells
3193 Approval and test specification—Transformer-type battery chargers
4044 Battery chargers for stationary batteries

AS/NZS
2401 Battery chargers for lead-acid batteries—Domestic type
2401.2 Part 2: Battery chargers for valve-regulated cells
3350 Approval and test specification—Safety of household and similar electrical appliances
3350.2.29 Part 2.29: Particular requirements—Battery chargers