AS/NZS 2293.2:2019

Australian/New Zealand Standard

Emergency lighting and exit signs for buildings

Part 2: Routine service and maintenance

Superseding AS/NZS 2293.2:1995

AS/NZS 2293.2:2019

This joint Australian/New Zealand standard was prepared by joint Technical Committee LG-007, Emergency Lighting in Buildings. It was approved on behalf of the Council of Standards Australia on 25 March 2019 and by the New Zealand Standards Approval Board on 30 January 2019.

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Business New Zealand
Engineers Australia
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This standard was issued in draft form for comment as DR AS/NZS 2293.2:2018.

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Australian/New Zealand Standard

Emergency lighting and exit signs for buildings

Part 2: Routine service and maintenance

Originated in Australia as AS 2293.2—1979.
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee LG-007, Emergency Lighting for Buildings, to supersede AS/NZS 2293.2:1995, *Emergency escape lighting and exit signs for buildings*, Part 2: *Inspection and maintenance*.

The objective of this Standard is to establish the performance criteria for the routine service and maintenance of emergency lighting and exit sign systems, such that they continue to safeguard occupants until the next scheduled activity from injury by having adequate emergency lighting and identification of exits, and provide direction to exits in accordance with the approved design.

The changes in this edition are primarily a consequence of alterations made in AS/NZS 2293.1:2018 and AS/NZS 2293.3:2018.

The following changes of significance have been introduced:

(a) The layout has been aligned with AS 1851, *Routine service of fire protection systems and equipment*. A series of tables and figures has been introduced to simplify application, and reduce duplication and complexity.

(b) Introduction of—

  (i) baseline data against which maintenance and ongoing system performance requirements are measured;

  (ii) concept of routine service, including preventative maintenance;

  (iii) procedures for intervals greater than 12 months;

  (iv) concepts of critical, non-critical defect and non-conformance along with requirements for reporting;

  (v) light source life (LSL) assessment for LED luminaires and exit signs; and

  (vi) additional information and guidance in Appendices C, D, E, F and G.

(c) Update references and requirements to align with most recent International and Australian Standards.

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.

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

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Australian/New Zealand Standard
Emergency lighting and exit signs for buildings

Part 2: Routine service and maintenance

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out requirements and test procedures for the routine service and maintenance necessary to ensure emergency lighting and exit sign systems are in a state of readiness for operation at all times.

1.2 APPLICATION

This Standard provides a systematic basis for minimum routine service applicable for emergency lighting and exit sign systems. It requires evidence, in the form of records and reports of completion of the periodic inspection (including survey), testing and preventive maintenance activities required by this Standard. It may also be used to develop specific routine service requirements for systems or equipment that are part of a performance solution.

NOTE: This Standard may assist users meet other obligations. Recommendations on the removal, collection, movement, disposal or recycling of components or luminaires that may contain hazardous materials, for example, fluorescent lamps (mercury) and batteries (cadmium, nickel or lead), is included in Appendix G.

1.3 NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document:

NOTE: Documents referenced for informative purposes are provided in the Bibliography.

AS
2676 Guide to the installation, maintenance, testing and replacement of secondary batteries in building
2676.1 Part 1: Vented cells
2676.2 Part 2: Sealed cells

AS/NZS
2293 Emergency lighting and exit signs for buildings
2293.1 Part 1: System design, installation and operation
2293.3 Part 3: Emergency luminaires and exit signs

IEC
62485 Safety requirements for secondary batteries and battery installations
62485-1 Part 1: General safety information
62485-2 Part 2: Stationary batteries

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1.4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 2293.1 apply along with the following:

1.4.1 Adverse operating environments

Any environment or condition that may adversely affect the performance or reliability of an emergency lighting or exit sign system.

1.4.2 Approved design

The final design, as commissioned or subsequently modified.

NOTES:

1 In Australia, this is the building solution as defined within the NCC.

2 In New Zealand, this is defined by the New Zealand Building Code.

1.4.3 Baseline data

Data either provided by or derived from the approved design and commissioning thereof which, when and where provided serve as a basis for verification of results of inspection, test and survey.

1.4.4 Competent person

A person who has acquired through training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the required task correctly.

1.4.5 Defect classification and non-conformance

1.4.5.1 *Critical defect*

A defect that renders a system inoperative.

NOTE: A critical defect is likely to affect an entire system and is reasonably likely to have a significant adverse impact upon the safety of occupants of part, or all, of a building. Examples include, in a central battery system the failure of the battery or failure to sense loss of supply, a non-operational exit sign where it is the only available sign in a space, an impaired emergency luminaire, which is unable to provide sufficient light to an important aspect of a lighting system, i.e. at stairs, a change in floor level or direction.

1.4.5.2 *Non-critical defect*

A system impairment or faulty component not likely to critically affect the operation of the system.

NOTE: Examples of non-critical defects include failure of one luminaire within an area served by multiple luminaires, functioning self-contained luminaires with an inoperative manual or automatic test system.

1.4.5.3 *Non-conformance*

Missing information or incorrect feature that does not affect the system operation but is required to facilitate ongoing routine service.

NOTE: Examples of non-conformance include inadequate baseline data, missing baseline data maintenance records or reports, no equipment location or identification shown or illegible labels.

1.4.6 Inspect/inspection

Visual examination of the components to record settings, parameters, physical condition or fitness for purpose.

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1.4.7 Light source life (LSL)

Length of time during which a population of light sources provides more than a minimum luminous flux percentage and less than the claim for failure fraction percentage under specified conditions.

NOTE: For further information refer to IEC 63013.

1.4.8 Preventative maintenance

Actions including cleaning, adjustment and replacement of components at a predetermined frequency, to minimize incidence of failure.

1.4.9 Rectify/rectification

The repair or replacement of components found to be defective.

1.4.10 Responsible entity

The entity responsible for the routine service of the emergency lighting or exit sign system.

NOTE: Typically, the building owner, the building occupier or the building owner's agent.

1.4.11 Routine service

Inspection (including survey), test and preventative maintenance at specific intervals.

1.4.12 Shall

Indicates that a statement is mandatory.

1.4.13 Should

Indicates a recommendation.

1.4.14 Survey

Visual inspection, typically conducted from floor level, to identify if the emergency lighting or exit sign system has been adversely altered, damaged or compromised by changes in the occupancy, environment, construction or building.

1.4.15 Test

An action or procedure undertaken to confirm the correct operation or performance of a component or system.

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SECTION 2 GENERAL REQUIREMENTS

2.1 ROUTINE SERVICE AND MAINTENANCE OF THE INSTALLATION

The emergency lighting and exit sign system shall be inspected, tested and maintained in accordance with the relevant procedures specified in this Standard. The inspection, test, survey and maintenance procedures shall be carried out by competent persons only.

2.2 BASELINE DATA OF THE INSTALLATION

The baseline data for the emergency lighting and exit sign system may be needed to verify the result of a routine service activity required by an applicable service schedule.

The baseline data for the emergency lighting and exit sign system shall be readily accessible to service personnel.

The baseline data required by this Standard shall be that which is necessary to verify a routine service activity result.

Irrespective of the availability of baseline data, the routine service activity shall be carried out and the result recorded and reported.

Where baseline data is available, the routine service result shall be verified against it.

Where required baseline data is not available, its unavailability shall be recorded and reported as a non-conformance.

The baseline data shall include the required in-service duration.

In Australia, refer to AS/NZS 2293.1. For most situations, the in-service duration is 90 minutes.

In New Zealand, refer to the New Zealand Building Code.

NOTES:

1 The supply and generation of baseline data is beyond the scope of this Standard.

2 A variety of emergency lighting and exit sign light source and battery technology or monitoring systems may be available. All information relating to the correct servicing of emergency lighting, exit signs or related systems, irrespective of technology used, should be held with the installation baseline data. For example, luminaire information and any operating and maintenance manuals should be available and retained for the life of the building.

3 Requirements that relate to emergency luminaires and exit signs are detailed in AS/NZS 2293.3.

2.3 SERVICE PRECAUTIONS

Prior to commencing any routine service, the following precautions shall be taken:

(a) Determine the risk and ensure all reasonable precautions will be taken to not adversely affect the normal operation of any system, except for those systems to be serviced, or to adversely affect safety of the building occupants.

(b) Inform the responsible entity—

(i) that a routine service is to be carried out, which may adversely affect the occupants or operations of the building;

(ii) of the extent and expected duration of the impairment during the routine service and maintenance so that alternative safety arrangements can be implemented; and

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(iii) that part of the building may be without emergency lighting when a discharge test of the emergency luminaires and exit signs is undertaken.

NOTE: When selecting a time for the discharge test, the nature of the occupancy of the building should be considered. Risk mitigation may include undertaking a discharge test of tenanted floors during daylight and fire stairs after hours or conducting the test discharge at a time that will permit recharging of the battery when the building is unoccupied.

(c) Ensure that no interruption to the normal supply has taken place for a period of at least 16 h prior to conducting a discharge test of the emergency luminaires and exit signs.

On completion of any routine service and maintenance, all controls shall be returned to their prior state. Any function left impaired, disabled or not restored to 'normal', shall be recorded in the service and maintenance records.

2.4 SYSTEM RETROFIT

Absent elements or components of a system or systems that were not required as part of an approved design to a Standard that is now superseded are not required to be retrofitted and the related routine service activity shall not be considered a defect or non-conformance if not able to be performed.

2.5 FREQUENCY AND TOLERANCES OF ROUTINE SERVICE INTERVALS

2.5.1 General

The service frequencies and tolerances shall be in accordance with Appendix A.

The service frequency shall be scheduled from the date of the initial service activity. Tolerances shall be applied to the scheduled date. An activity that is not conducted within the tolerance period for that activity shall be reported as an out of tolerance activity within one week of the end of the tolerance period.

2.5.2 Service schedules

At the applicable routine service frequency and tolerance interval, the designated emergency lighting or exit sign system shall be subjected to the schedules shown in Appendix A.

The routine service and maintenance activities of self-contained emergency luminaire and exit sign systems and centrally supplied systems shall be carried out in accordance with the activities set out in Tables A1 to A6 of Appendix A, as applicable. Figure 1 is a flow chart of routine service and maintenance for the six monthly, yearly and ten yearly service schedules. The left side refers to single point (self contained) and the right side refers to central battery systems.

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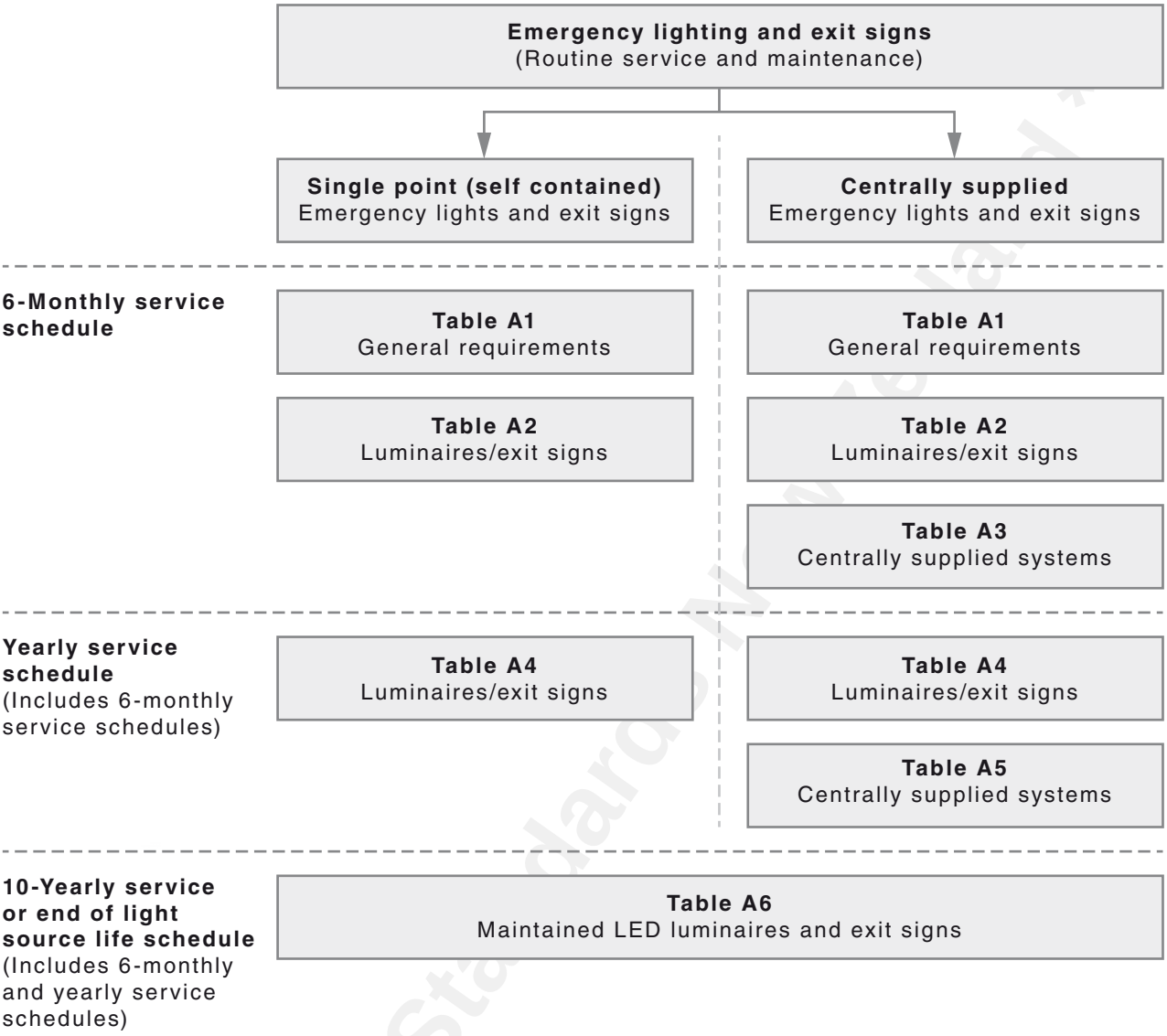


FIGURE 1 ROUTINE SERVICE AND MAINTENANCE SUMMARY FLOWCHART

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2.6 RECORDS AND REPORTING

Records and reporting shall be in accordance with Clauses 2.7 and 2.8.

Table 1 summarizes the requirements for the provision of records and reports.

TABLE 1

PROVISION OF RECORDS AND REPORTS

Record/Report	Provided	Kept	Includes	Purpose
Service and maintenance record (Clause 2.7)	Before leaving the site or within one week	On site electronically or as otherwise determined	Detail of the routine service and maintenance activities conducted and the results of these activities	Provides detail of the service and maintenance activities conducted and the results of these activities including whether their system is operating correctly and, if not, what are the defects or non-conformances
Yearly Condition Report (Clause 2.8.2)	Yearly	As determined by responsible entity	Summary of system status including any outstanding defects and non-conformances	Provides a summary of all services and maintenance conducted that year, advises whether their system is operating and, if not, advises what are the defects or non-conformances. Can be used to assist the responsible entity in meeting their annual reporting requirements, where applicable.

2.7 ROUTINE SERVICE AND MAINTENANCE RECORDS

2.7.1 General

Service and maintenance records shall be—

(a) logged at the time of servicing and maintenance;

(b) provided to the responsible entity before leaving the site or within one week of service or maintenance; and

(c) kept on the premises electronically or as otherwise determined.

2.7.2 Format of records

Records and reports shall be in one of the following forms:

(a) Electronic.

(b) A log book with a durable cover.

(c) Printed and held securely within a durable cover.

2.7.3 Required information

The following details shall be recorded in routine and service maintenance records:

(a) Name and address of building or site.

(b) Date of service and scheduled date of service (see Clause 2.5).

(c) Details of all installed emergency escape luminaires and exit signs and associated equipment on site.

(d) Quantity and type of systems and equipment serviced and frequency of service performed.

(e) Quantity, type and location of systems and equipment not serviced.

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(f) Details of each non-conformance or defect including its classification, location and any rectification completed.

(g) Name of responsible entity.

(h) Name and signature of the service person and date.

(i) Name of company undertaking routine service and maintenance.

2.7.4 Record retention

Routine service and maintenance records shall be retained for a minimum period of seven years.

2.8 CRITICAL DEFECTS

2.8.1 General

Notification of critical defects shall be provided before leaving the site or, where this cannot be achieved, as soon as possible. Critical defects shall be confirmed in writing within 24 hours of the defect identification and reconfirmed each time the defect is identified.

This confirmation in writing may be in the form of the service and maintenance records as per Clause 2.7 but shall be provided within 24 hours.

2.8.2 Yearly condition report

Evidence of conformance with this Standard shall take the form of one or more condition reports. A condition report shall provide a summary of the routine service and maintenance records for the activities and shall be issued to the responsible entity on an annual basis.

NOTE: The condition report should be submitted as soon as practicable after completion of the yearly routine service.

The condition report shall contain details of any missed service activities and/or all outstanding critical or non-critical defects and non-conformances. If the outstanding defects reported result in the emergency lighting and exit sign system or equipment no longer being operational, such non-operational status shall be noted in the report.

The condition report shall contain the following:

(a) Name and address of building or site.

(b) Period covered by this report.

(c) System or equipment identification and location.

(d) Applicable approved design.

(e) Critical defects outstanding.

(f) Non-critical defects outstanding.

(g) Non-conformances outstanding.

(h) Summary of the relevant routine service and maintenance records.

(i) Any missed service activities.

(j) Statement of condition of serviced emergency lighting and exit sign system(s).

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NOTES:

1 An example of a yearly condition report is shown in Appendix D.

2 It is intended that the yearly condition report be used as supporting evidence for state or territory regulatory compliance of emergency lighting or exit sign systems or equipment.

3 A recommendation should be sent to the responsible entity that critical defects be rectified with the minimum of delay and non-critical defects or non-conformances be rectified as soon as practicable prior to the next yearly condition report.

4 This is similar to the yearly condition report requirement in AS 1851.

5 A statement on any recycling actions taken or recommendations made (e.g. for luminaires, lamps, batteries, etc.) may also be included in the report.

2.9 RELATIONSHIPS AND THIS STANDARD

Figure 2 shows the relationship between the overall building systems, defects and the routine service and maintenance requirements of this Standard. The requirements of this Standard are shown within the dashed line.

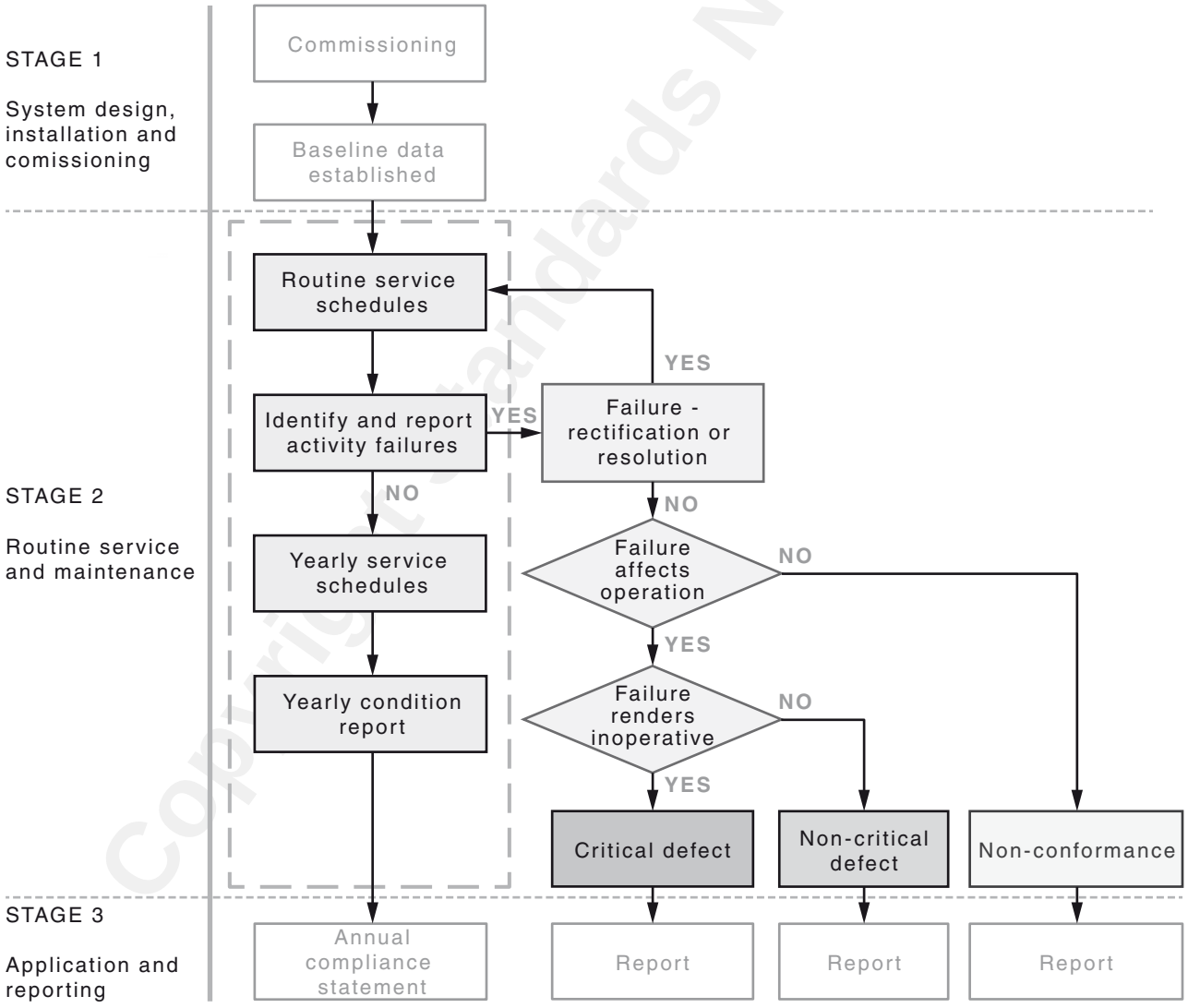


FIGURE 2 RELATIONSHIP BETWEEN THIS STANDARD AND OVERALL MANAGEMENT OF THE SYSTEM

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C2.9 *This diagram illustrates the main processes and procedures for routine service to this Standard and how it fits into the regulatory framework.*

In particular:

(a) *The section in the dotted box illustrates the main routine service processes and procedures.*

(b) *The section on the right illustrates how routine service activity failures are addressed. That is, how it is determined if a failure is a critical or non-critical defect or non-conformance.*

(c) *The greyed-out boxes above the dotted box illustrate the system design, installation and commissioning stage.*

(d) *The greyed-out boxes below the dotted box illustrate application and reporting.*

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SECTION 3 INSPECTION, SURVEY, TEST, SERVICE AND MAINTENANCE PROCEDURES

3.1 GENERAL

The following procedures shall be carried out for all emergency luminaires and exit signs.

3.2 REQUIRED PROCEDURES

The designated emergency lighting or exit sign system shall be subjected to the requirements of the service schedules shown in Appendix A.

NOTE: For emergency luminaires and exit signs with non-operating replaceable lamps or tubular fluorescent lamps that exhibit excessive end-blackening even if the lamps still operate, the lamps should be replaced before the discharge test.

3.3 SELF-CONTAINED EMERGENCY LUMINAIRE AND EXIT SIGN SYSTEMS

3.3.1 General

Groups (circuits) of self-contained emergency luminaires and exit signs may be tested on a rotational basis, provided the service frequency and tolerance intervals for each luminaire or exit sign does not exceed those specified.

NOTE: Emergency and exit lighting may include fluorescent lamps that contain mercury. These should be collected, stored separately and recycled; refer to Appendix G. Recycling may be in accordance with voluntary schemes. Contracts and jurisdictions are increasingly requiring the removal and recycling of hazardous material that may be contained in lamps and batteries.

3.3.2 Battery replacement

Whenever the battery of a self-contained, single-point emergency luminaire or exit sign is replaced, such replacement shall be made in accordance with the following:

(a) Where more than one cell is utilized, the complete battery pack shall be replaced.

(b) Replacement batteries shall be of the same compatible type and ampere-hour capacity.

(c) The luminaire test switch shall be used to confirm operation of the new battery.

(d) At the next routine service interval, a discharge test shall be conducted on the luminaire or exit sign in accordance with Table A2. The duration shall be the in-service duration stated in Clause 2.

NOTE: The principle to be applied is inspect, test, repair. The test switch is used to check operation, not duration. The expectation is that product with a new battery will operate until the next scheduled routine service.

(e) Details of any of the above actions shall be recorded.

NOTES:

1 See Appendix B for information to facilitate the maintenance of batteries and battery chargers.

2 End-of-life batteries should be collected and recycled. Refer to Appendix G.

3.3.3 Replacement of an emergency luminaire or exit sign

Whenever an emergency luminaire or exit sign is required to be replaced, it shall be replaced with the same or a compatible luminaire or exit sign where the performance of the replacement is not less than the original and technical data for the replacement shall be included with the baseline data to ensure continued building conformance.

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3.4 CENTRAL BATTERY EMERGENCY LUMINAIRE AND EXIT SIGN SYSTEMS

3.4.1 General

A central battery system shall be tested to verify the performance and operation of the system under mains fail conditions. Circuits, emergency luminaires or exit signs may be tested individually or collectively provided the service frequency and tolerance levels for each circuit, luminaire or exit sign do not exceed those specified.

Whenever data is recorded for individual cells of the battery, cell numbers shall be designated in sequence, commencing from the positive end.

Maintenance of battery systems that is carried out in accordance with the procedures of AS 2676.1 or AS 2676.2, or IEC 62485-1 or IEC 62485-2, as applicable, shall be deemed to conform with the applicable clauses in this Section.

3.4.2 Battery replacement—Central systems

Whenever a cell of a central battery emergency luminaire and exit sign system is replaced for any reason, the replacement shall be made in accordance with the following:

(a) Replacement batteries shall be of the same or compatible type and ampere-hour capacity.

(b) At the next routine service interval, a discharge test shall be conducted in accordance with Table A2. The duration shall be the in-service duration stated in Clause 2.2.

NOTES:

1 See Appendix B for information to facilitate the maintenance of batteries and battery chargers.

2 End-of-life batteries should be collected and recycled.

3.5 LED LUMINAIRES AND EXIT SIGNS

3.5.1 General

In addition to the requirements of Clause 3.3 for self-contained emergency luminaire and exit sign systems and Clause 3.4 for central systems, this Standard includes procedures for the lumen maintenance life assessment of LED luminaires and exit signs in these systems. These procedures are explained in Clause 3.5.2 below.

3.5.2 Procedures for end of light source life (LSL) of maintained LED luminaires and exit signs

3.5.2.1 *General*

The procedures specified in Table A4 (rows 4.14 and 4.15), where no manufacturer's declared LSL exists, and Table A6, where a manufacturer's declared LSL exists, shall be carried out when required to check the light source life (LSL) of maintained LED luminaires and exit signs. The service frequency and tolerance interval to be applied is shown in Appendix A. Any changes and all results shall be recorded.

The manufacturer's declared LSL applies to maintained emergency luminaires and maintained exit signs only and is assigned in accordance with the LSL requirements for LED exit signs detailed in AS/NZS 2293.3.

Where no manufacturer's declared LSL exists, the relevant tests and conformance conditions of Table A6 apply 12 months from commissioning of the installation.

Where the manufacturer's declared LSL is specified, the ongoing performance of installed maintained LED luminaires and exit signs shall be assessed at the next service interval.

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For maintained LED luminaires and exit signs, at the end of the LSL either—

(a) the luminaire/exit sign or light source shall be replaced; or

(b) the ongoing performance of the installed LED luminaire or exit sign shall be checked to ensure the ongoing viability of the luminaire or exit sign.

To check the ongoing LSL viability, a representative number of LED luminaire exit sign samples shall be taken from the site and their performance measured (see Clause 3.5.2.4). The results are intended to confirm if the installed luminaires or exit signs will continue to provide not less than the minimum requirements for these luminaire or exit sign types and that they are suitable for ongoing service for a period of time into the future.

3.5.2.2 *End of LSL–LED luminaires*

At the end of the LSL, the ongoing performance of the installed maintained emergency LED luminaires shall be tested by measurement according to Clause 3.5.2.4. Where the results fall below the minimum requirement this shall be reported to the responsible entity as a routine service failure.

3.5.2.3 *End of LSL–LED exit signs*

At the end of the LSL, the ongoing performance of the installed LED exit signs shall be checked by measurement according to Clause 3.5.2.4. Where the results fall below the minimum requirement this shall be reported to the responsible entity as a routine service failure.

3.5.2.4 *Measurement*

A number of maintained emergency luminaires or exit signs shall be collected and tested as follows:

(a) The number of test samples required shall be determined from the number of the same or compatible type and vintage of luminaire or exit signs installed, where—

(i) one sample if <100 are installed; or

(ii) two samples if <500; otherwise

(iii) three or more samples.

NOTE: There may be many types of luminaires in an installation. The intent is for a service person to assess the need for each type to be tested. Any increase in the number of types that may be included in a single test (to reduce test load) necessitates a risk assessment and the rationale should be recorded. Factors that affect LSL include LED chip, control gear settings and operation temperature.

(b) Select and replace the visually representative sample(s), i.e. dullest or with lowest apparent brightness.

(c) Subject samples to the following tests:

(i) For maintained LED luminaires, determine the illuminance and classification in accordance with the requirements for the procedure for deriving the luminaire classification detailed in AS/NZS 2293.3, except for self-contained emergency luminaires, in which case, replace the d.c. power supply and use the fully charged battery supplied with the luminaire for the test.

(ii) For maintained LED signs, determine the minimum face luminance in accordance with AS/NZS 2293.3.

NOTE: Only the minimum C_0 value is required.

3.5.2.5 *Luminaire or dual function exit sign conformance*

All test samples shall achieve the declared photometric classification. This shall be reported in accordance with the requirements of Table A4, Item 4.8.

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3.5.2.6 *Exit sign conformance*

All test samples shall achieve the minimum luminance requirements set out in this Clause.

Where LED exit signs are measured in accordance with the procedure in Clause 3.5.2.4, the minimum luminance shall be greater than 10 cd/m^2. Signs that meet this requirement are deemed to be suitable for a further five years before re-assessment of this criteria is required.

For LED exit signs, the method to determine the light source life is detailed in AS/NZS 2293.3 in accordance with the requirements for projection of light source life (LSL) in LED exit signs.

NOTES:

1 The minimum luminance of an exit sign is 8 cd/m^2. For an LED exit sign this minimum should be based on the end of rated lumen maintenance life. If a manufacturer provides an exit sign with a significantly higher luminance the L_{xx} value may also be shown, i.e. L_{50}.

2 The in-situ temperature assessment is shown in IES LM-84 Annex A.

3 A service person may use these test results as evidence of the likely ongoing performance and viability of the installed signs. If the sign is of a known age and the results are above the minimum requirements, they could continue to comply with the minimum requirements for what could conceivably be up to five years into the future. This is especially true if the exit sign data can be compared to the manufacturer's original report or data provided as baseline data.

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APPENDIX A

ROUTINE SERVICE INTERVAL REQUIREMENTS AND SCHEDULES

(Normative)

A1 GENERAL

This Appendix specifies the requirements to be carried out on the designated emergency lighting or exit sign system at each routine service interval. Any changes and all results of service shall be recorded in accordance with Clause 2.7.

A2 SIX-MONTHLY REQUIREMENTS

The activities specified in Tables A1 to A3 shall be carried out at the six-monthly service frequency, with a tolerance interval of ±1 month.

TABLE A1

SCHEDULE 1—SIX-MONTHLY—SERVICE AND MAINTENANCE RECORDS

Item	Title	Activity	Record (Pass/Fail, result or comment)
1.1	Service and maintenance records	Check the service and maintenance records and confirm the previous scheduled inspection and/or test was completed and within tolerance	Record outcome
1.2	Service and maintenance records—Critical defects	Check the service and maintenance records and confirm any previously recorded critical defects have been rectified	Record outcome
1.3	Service and maintenance records—Non-critical defects	Check the service and maintenance records and confirm any previously recorded non-critical defects have been rectified or other actions taken	Record outcome
1.4	Service and maintenance records—Non-conformances	Check the service and maintenance records and confirm any previously recorded non-conformances have been rectified or other actions taken	Record outcome
1.5	Service and maintenance records—Observations	Check the service and maintenance records and review any previously recorded observations	Record outcome

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TABLE A2

SCHEDULE 2—SIX-MONTHLY—SELF CONTAINED EMERGENCY LUMINAIRES AND EXIT SIGNS

Item	Title	Activity	Record (Pass/Fail, etc.)
2.1	Emergency luminaire, exit and directional signs	Inspect each emergency luminaire or exit sign. Record if it is functioning, i.e. operating as required.	P/F for each item
2.2	Emergency luminaire, exit and directional signs—Condition	Check each emergency luminaire or exit sign is free from significant damage, deterioration, contamination or other condition that is likely to adversely affect its function. Record outcome, e.g. noted, replaced, cleaned. See Notes 1 and 2.	P/F for each item
2.3	Exit and directional signs—Direction to required exit	Inspect each emergency exit and directional sign. Confirm the sign is directing traffic correctly in accordance with the approved design	P/F for each item
2.4	Exit and directional signs—Sensors or other controls	Inspect each emergency exit and directional sign, (i.e. internally illuminated, dual function or low luminance—theatre exits or externally illuminated exit signs) are not on a sensor or time controlled circuit. Record result.	P/F for each item
2.5	Requirements for exit signs	Check all exit signs for correct situational use in accordance with the baseline data. Record a pass if all exit signs are suitable for situational use. NOTE: Each type of exit sign (internally illuminated, low luminance or externally illuminated) has distinct applications.	P/F
2.6	Automatic test systems, control and indicating equipment—Condition	Inspect control and indicating equipment for any condition for that could adversely affect its operation. See Note 3.	P/F
2.7	Emergency luminaire and exit signs—Initiate duration test	Initiate the operation of each emergency luminaire and exit sign by simulating the loss of primary power using the designated test facility, which may be automatic, manual, circuit breaker or fuse.	Record start time
2.8	Emergency luminaire and exit signs—Duration test	Inspect each emergency luminaire or exit sign for the required duration. Record the pass/fail result for each fitting. (The record may be via self-test indication, automatic or manual methods.)	P/F for each item
2.9	Defined service life	Check the log book and baseline data for any emergency luminaire, exit sign or component with a defined service life. Record each item that has exceeded the defined service life or is due for replacement before the next scheduled maintenance activity.	P/F

(*continued*)

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TABLE A2 (*continued*)

Item	Title	Activity	Record (Pass/Fail, etc.)
2.10	Check each initiated discharge system is reverted to normal operation	Inspect each automatic or manual discharge test facility and ensure it has been returned to normal operation.	P/F
2.11	Check externally illuminated exit sign. Greater than 200 lx is required on face	Measure illumination on face of any externally illuminated (i.e. image on wall) exit sign. Record measured result. Record higher than 100 lx. Pass if greater than 200 lx.	P/F

NOTES:

1 Refer to Appendix C for information on cleaning.

2 Conditions affecting exit signs include any aspect that may affect the visibility of an exit sign. Specular reflectance on the face of an exit sign may reduce sign readability at certain viewing angles. This should be considered by installers and in maintenance. For example, a window or bright light may be reflected in the face of an exit sign such that it is difficult to read.

3 Refer to Appendix F for guidance on computer system maintenance for automatic test systems.

TABLE A3

SCHEDULE 3—SIX-MONTHLY—CENTRAL BATTERY SYSTEMS

Item	Title	Activity	Record (Pass/Fail, etc.)
3.1	Control, charger and indicating equipment	Inspect control and indicating equipment for any condition that could adversely affect its operation	P/F
3.2	Battery power supply—Electrolyte level (where required)	Inspect the electrolyte level in each cell and top up with distilled or demineralized water to comply with the manufacturer's recommendations	Cell No. ..... Electrolyte level P/F Action taken .....
3.3	Battery power supply—Electrolyte leakage	Inspect each cell for any electrolyte leakage. Neutralize and mop up any spilt liquid, as necessary	Cell No. ..... P/F
3.4	Battery power supply—Terminal connection	Inspect each cell connection for any evidence of corrosion and ensure each conductor joint is secure. Treat each exposed metal surface with a coating of petroleum jelly or other suitable battery terminal preservative	Cell No. ..... P/F
3.5	Control, charger and indicating equipment—Battery charger	Inspect each battery charger for any condition which could adversely affect its function	P/F
3.6	Control, charger and indicating equipment—Contamination	Inspect each control, charger and indicating equipment cabinet and ensure excessive contamination is removed or cleaned prior to undertaking a test	P/F
3.7	Control, charger and indicating equipment—Conductor connections	Inspect each conductor connection and confirm each connection is secure	P/F

(*continued*)

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TABLE A3 (*continued*)

Item	Title	Activity	Record (Pass/Fail, etc.)
3.8	Control, charger and indicating equipment—Float voltage	Measure and record the battery charger float voltage and ambient battery temperatures. Verify the charger float voltage against manufacturer's recommendation to ensure that, when corrected for temperature, the float voltage value is within the required limits.	Battery Voltage ....V Ambient temperature P/F
3.9	Batteries-Flooded lead acid (where installed)	Measure and record the overall battery voltage and each cell voltage to the second decimal place	Battery Voltage ....V P/F Cell 1 Voltage .....V P/F Cell 2 Voltage .....V P/F Cell 3 Voltage .....V P/F
3.10	Control, charger and indicating equipment—Visual and aural indicators	Check the operation (where possible) of each visual and/or aural indicator	P/F
3.11	Battery enclosure ventilation	Inspect each battery enclosure to ensure there is adequate ventilation and ensure there is no accumulated hazardous gasses	P/F

A3 YEARLY REQUIREMENTS

The procedures specified in Tables A4 and A5 shall be carried out at the yearly service frequency, with a tolerance interval of ±2 months.

NOTE: All applicable tests of the shorter service intervals are also required at the yearly service, i.e. apply 6 month tests and then the 1 year conditions.

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TABLE A4

SCHEDULE 4—YEARLY—SELF CONTAINED EMERGENCY LUMINAIRES AND EXIT SIGNS

Item	Title	Activity	Record (Pass/Fail, result or comment)
4.1	Six-monthly service	Conduct each activity set out in Schedules 1, 2, and 3, as appropriate. Confirm each activity has been completed and record the results	P/F
4.2	Indirect lighting systems—Reflecting surfaces (where fitted)	Inspect the finish of predominant reflecting surfaces, including ceilings and walls for any change that could adversely affect the approved design	P/F
4.3	Directional beam luminaires (where fitted)	Inspect each directional beam is aimed in accordance with the approved design and it is not directed into the eyes of the occupants while moving through the path of travel to a required exit	P/F for each directional beam
4.4	Normal lighting and emergency operating relationship	Inspect the emergency luminaire and exit sign is in the correct relationship to the normal lighting in the designated area. (See general requirements for the arrangement and control of emergency luminaires and exit signs in AS/NZS 2293.1.)	P/F for each fitting
4.5	Emergency luminaire and exit signs—Tubular fluorescent lamps	Inspect each emergency luminaire or exit sign fitted with a tubular fluorescent lamp. Replace any lamp with excessive end-blackening	Fitting number ..... Tube replaced
4.6	Exit signs—Performance reduction through light emission depreciation	Inspect each exit sign to ensure it is operating, is distinctly visible and that there has been no visually significant reduction in light output or brightness	P/F for each exit sign
4.7	Exit signs—Externally illuminated	Inspect each exit sign location. Ensure the associated emergency luminaire is operating and exit sign is distinctly visible	P/F for each associated luminaire and exit sign
4.8	LSL (end of light source life)	Check each emergency luminaire or exit sign has sufficient LSL remaining to achieve next routine service. Once LSL is achieved, refer to Table A6. Refer to Notes 2 and 3.	P/F for each emergency luminaire or exit sign
4.9	Survey—Emergency light and exit sign schedule	Check the emergency luminaire or exit sign against the listing of products installed or location listing or drawings for any condition, alteration or addition since the last scheduled maintenance activity	Record outcomes
4.10	Survey—Fire control centre (where fitted)	Inspect and test each required fire control centre to verify the minimum illumination requirement achieves the approved design	P/F
4.11	Survey—Emergency Luminaires	Inspect the building to ensure the there is adequate emergency lighting in accordance with the approved design	P/F
4.12	Survey—Exit and directional signs	Inspect the building to ensure that there is adequate identification of exits and paths of travel to exits, in accordance with the approved design; i.e. check for unauthorized modification of building use since last audit	P/F
4.13	Inspect—Non-maintained exit signs	Check non-maintained exit signs are illuminated when smoke detectors are fitted and activated	Where applicable

(*continued*)

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TABLE A4 (*continued*)

Item	Title	Activity	Record (Pass/Fail, result or comment)
4.14	LED-maintained emergency luminaires—Performance reduction through light emission depreciation	Where no manufacturer LSL specified the ongoing viability of the installed luminaires shall be assessed in accordance with Clause 3.5.2. Check the spacing between emergency luminaires is in accordance with the classification determined above.	P/F for each sample. Record recommendation of ongoing operation of luminaires on site. Confirm luminaire spacing on site
4.15	LED exit signs or directional signs—Performance reduction through light emission depreciation	Where no manufacturer declared LSL specified, the ongoing viability of the installed signs shall be assessed in accordance with Clause 3.5.2.3.	P/F for each sample. Record recommendation of ongoing operation of exit signs on site

NOTES:

1 Where fitted, recognizes that the absence of elements or components of a system that were not required as part of the approved design need not be retrofitted and the related routine service activity is not to be considered a defect or non-conformance if not performed.

2 LED manufacturer's LSL is as shown in AS/NZS 2293.3. It is based on L_{70} values calculated from the in-situ temperature measurement temperature applied using IEC 63013 or the IES TM-21 or IES TM-28 methodology.

3 The LSL is a basic requirement checked each year, as the LSL may be rated as some other period than 1, 5 or 10 years, i.e. 4 or 7 years. For example, If LSL is stated as being 7 years, it will be necessary to apply the LSL test conditions, once the luminaire has been in service for 7 years.

4 Exit sign type may include internally illuminated, exit sign only or dual function (emergency luminaire and exit sign), low luminance—theatre exits or externally illuminated (image on wall) signs.

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TABLE A5

SCHEDULE 5—YEARLY—CENTRAL SYSTEMS

Item	Title	Activity	Record (Pass/Fail)
5.1	Six-monthly—Central systems	Conduct each activity set out in Schedules 1, 2 and 3, as appropriate. Confirm each activity has been completed and record the results	P/F
5.2	Central systems only—Batteries—Lead acid	Record the electrolyte density and state of charge for each cell. NOTE: State of charge determined from the measured electrolyte density and the data provided in the operating and maintenance manual or by the manufacturer of the battery.	Cell No. ..... Electrolyte density ..... State of charge.....
5.3	Central systems only—Batteries—All types	Record the overall battery voltage and each cell voltage with an instrument having an accuracy of 1.5% or better. Record each voltage to the second decimal place	Cell No. ..... Cell float voltage ..... Overall voltage .....
5.4	Central systems only—Batteries—All types	Check each battery and cell voltages obtained to ensure each battery is being charged correctly and operating within its required parameters	Cell number..... P/F
5.5	Central systems only—Control, charger, batteries and indicating equipment—Voltmeter	Verify and record the calibration of each voltmeter used with an instrument having an accuracy of Class 1% or better	P/F for each volt meter
5.6	Central systems only—Battery voltage—After mains fail test	Record the overall battery voltage immediately after the simulated mains fail test. Acceptable limits for the battery voltage are specified under particular requirements for exit signs in AS/NZS 2293.1	Overall voltage
5.7	Central systems only—Battery voltage—After mains fail test	Restore the system to normal operation, turn the battery charger on, and manually select the boost-charge mode, if provided. Carry out the following: (a) Check that after the batteries have been recharged, the battery charger has changed over automatically to the float-charge mode. (b) For d.c. reticulated systems, measure the maximum voltage at the origin of the emergency lighting distribution system during boost charging. The voltage measured as required by Item (b) shall be not more than 125% of the nominal system voltage. This check may require the connection of a suitable peak-reading voltage measuring instrument during boost charging.	P/F

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A4 10 YEARLY AND END OF LIGHT SOURCE LIFE REQUIREMENTS

The procedures specified in Table A6 shall be carried out at the 10-yearly service frequency, with a tolerance interval of ±3 months, or when maintained LED emergency luminaires and exit signs have reached the LSL.

NOTE: This means all applicable tests of the shorter service intervals are also required, i.e. apply tests of 6-monthly and yearly, unless LSL has been reached.

TABLE A6

SCHEDULE 6—10 YEARLY AND END OF LIGHT SOURCE LIFE (LSL) OF MAINTAINED—LED LUMINAIRES AND EXIT SIGNS

Item	Title	Activity	Record (Pass/Fail)
6.1	Six-monthly and yearly services—All systems	Conduct each activity set out in Schedules 1 to 5, as appropriate. Confirm each activity has been completed and record results	P/F
6.2	Maintained LED emergency luminaires and dual function exist signs—LSL	Manufacturer declared LSL specified in the baseline data. The ongoing viability of the installed luminaire/exit sign shall be assessed (rounded to the nearest year) in accordance with Clause 3.5.2.5. Check the spacing between emergency luminaires is in accordance with the classification determined above	P/F for each sample. Record recommendation of ongoing operation of luminaires on site. Confirm luminaire spacing on site
6.3	LED exit signs or directional signs—LSL	Manufacturer declared LSL specified in the baseline data. The ongoing viability of the installed LED signs shall be assessed at the end of the specified LSL (rounded to the nearest year) in accordance with Clause 3.5.2.6	P/F for each sample Record recommendation of ongoing operation of exit signs on site.

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APPENDIX B

INFORMATION TO FACILITATE THE MAINTENANCE OF BATTERIES AND BATTERY CHARGERS

(Informative)

B1 CHECKING OF ELECTROLYTE LEVEL

The electrolyte level will gradually decrease owing to loss of water by gassing and evaporation. The rate of decrease varies for each installation depending on frequency of discharge/charge cycles; no general guidance can therefore be given on the decrease to be expected. However, on float-charging, negligible water consumption indicates undercharging and excessive water consumption indicates overcharging.

Experience will determine the normal pattern, and instances of marked departure from this pattern should be investigated to determine the cause and corrective action to be taken.

Individual cells of a battery that display these abnormalities should be inspected for—

(a) internal short-circuits; and

(b) loose or corroded inter-cell connections.

B2 BATTERY FLOAT-VOLTAGE LIMITS

During a routine test, if the battery float-voltage is discovered to be outside the limits determined from data in the operating and maintenance manual, the cause may be one of the following:

(a) Faulty voltage regulation of the battery charger.

(b) Mains voltage variation outside the input voltage tolerances specified for the battery charger under the relevant clauses of AS/NZS 2293.1.

(c) Battery charger overloaded. This may occur where an emergency lighting load is connected permanently across the battery and the load exceeds that for which the battery charger is designed.

(d) Inaccurate d.c. voltmeter.

B3 CELL FLOAT-VOLTAGES/ELECTROLYTE DENSITY

During routine tests of cells, individual cells displaying abnormal cell voltages or electrolyte density should be checked for—

(a) internal short-circuits; and

(b) loose or corroded inter-cell connections.

NOTE: Electrolyte density refers to flooded lead-acid batteries.

When the cause is identified, corrective action should be taken. The importance of this lies in the fact that early cell failure or loss of reserve capacity may result from a float-voltage outside the specified limits.

B4 NEUTRALIZING SPILT BATTERY LIQUID

Spilt battery liquid can be neutralized by application of the following solutions:

(a) Liquid from lead-acid batteries—Washing soda.

(b) Liquid from nickel-cadmium batteries—3% boric acid solution.

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APPENDIX C

CLEANING OF EMERGENCY LUMINAIRES AND EXIT SIGNS

(Informative)

Emergency luminaires and exit signs should be cleaned at regular intervals to remove accumulated dust or other deposits from the light transmitting and reflecting surfaces.

To maintain the overall efficiency of the luminaire or exit sign, it is essential that the correct cleaning compound be used for the particular materials involved. Table C1 provides guidance on cleaning materials and their use.

The information in Table C1 has been based on recommendations for the maintenance of interior lighting systems in AS 1680.1—2006.

TABLE C1
CLEANING SOLUTIONS AND THEIR USE

Material to be cleaned	Most suitable cleaner	Alternative cleaners	Remarks
Aluminium	Soap and water	—	Acidic or alkaline cleaners may cause chalking of the oxide surfaces. Aluminium should be rinsed thoroughly after cleaning
Glass	Detergents and water	Proprietary glazing cleaners	Polishing pastes and fluids are not recommended as these may leave a film on the glass surface which affects its characteristics in relation to moisture and dirt adhesion. Kerosene should not be used
Plastic	Non-ionic detergents and water	Ordinary detergents and water	Dust accumulates from a static charge developing on the plastic. It should not, therefore, be wiped but allowed to drip-dry after cleaning. Anti-static treatments are commercially available either as a polish, spray or solution in the rinse bath. Petroleum-based solvents should not be used.
Vitreous enamel	Detergents and water	Proprietary glazing cleaners	See above remarks for ‘Glass’
Stoved enamel	Detergents and water	—	Abrasive cleaners should not be used as they will damage the finish

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APPENDIX D

YEARLY CONDITION REPORT

(Informative)

Report number:	
Period covered: Responsible entity: — Name: — Address:	
Premises: (site level/address)	
System type:	
Approved design	
Statement:	I confirm that the system referred to above has been inspected, tested, surveyed and maintained in accordance with the relevant clauses of AS/NZS 2293.2, as shown in the attached routine service and maintenance records for the period above. With the exception of items detailed below as critical and non-critical defects, the system has been found to be functioning correctly and is in accordance with the approved design.
Outstanding – Critical defects	
Outstanding – non-critical defects	
Outstanding – Non-conformances	
Missed service activities:	
List relevant routine service and maintenance records (number/dates):	
Service provider: — Company name: — Address: — Representative: Signature: Date:	

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APPENDIX E

SERVICE CONCEPTS FOR POWERED SIGNS

(Informative)

	Description	Powered signs
Principle	Should we measure luminance or not? Factors that lead to depreciation. Undertake an activity to address reducing performance. Do we need to inspect and test?	Fluorescent and LED visual inspection is required each 6 months, Table A2, Item 2.3. Subjective, sign illuminated at 90 min, i.e. yes/no, distinctly visible = Pass/Fail
Methodology	How is this inspection or test performed?	Replace visually representative sample and send removed sample to lab for test to luminance requirements of AS/NZS 2293.3. Acceptable Quality Level (AQL) approach to determine conformance. If failed replace all or test further 3 samples or 10% of site samples
Sample size	How many?	Fluorescent and LED all visual inspection each 6 months, Table A2, Item 2.3
Frequency	How often should we do this inspection/test?	Luminance test at five years or replace when defined service life is exceeded

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APPENDIX F

GUIDANCE ON COMPUTER SYSTEM MAINTENANCE

(Informative)

Computer software is often used to monitor emergency lighting systems. Where such a system is installed, routine inspection and maintenance of the items should be carried out to ensure ongoing operation.

The computer should—

(a) be installed in a secure location, which can be accessed by technicians to carry out routine maintenance, one off testing or otherwise check system requirements;

(b) be a stand-alone system used only for emergency lighting system software;

(c) have a surge protection device; and

(d) allow the software to be constantly running to ensure constant monitoring of the emergency lighting system.

The computer system should be serviced as follows:

(i) Six-monthly:

  (A) Back up the system database.

  (B) Check and run test to ensure that the communication and backup components, such as cables, routers, repeaters, USB ports, and drives, are working. These should be checked for communications prior to testing in accordance with the schedules of Appendix A.

(ii) Yearly:

  (A) Check system software and update to the latest version (if applicable).

  (B) Clean and service computer/environment.

  (C) Carry out a packet count to routers and fittings (where applicable).

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APPENDIX G

DISPOSAL AND RECYCLING

(Informative)

This Standard provides a systematic basis for minimum routine service applicable for emergency lighting and exit sign systems. This includes removal of fluorescent lamps that contain mercury and batteries that may contain a variety of hazardous materials. Some jurisdictions have restrictions on movement and disposal of such items. Contracts may also impose additional requirements such as the recycling of the complete luminaire.

Records and reports in accordance with this Standard may be useful evidence of the removal and disposal (e.g. high-temperature incineration of nickel cadmium batteries) or recycling of materials.

During lamp or battery replacement, the competent person should review the installation for hazardous materials that may be present in fluorescent lamps, batteries or other components. Items identified for hazardous disposal or recycling should be marked and stored separately. Disposal or recycling needs to be in accordance with mandatory requirements where these exist or should be in accordance with voluntary schemes.

Evidence may be in the form of additional information included in the condition reports and service records, such as the following:

(a) Removal, collection and recycling of fluorescent lamps.

(b) Removal, collection of end-of-life batteries and method of disposal or recycling.

(c) Removal and recycling of replaced luminaires.

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Standards New Zealand

The first national standards organisation was created in New Zealand in 1932. The New Zealand Standards Executive is established under the Standards and Accreditation Act 2015 and is the national body responsible for the production of standards.

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Under a Memorandum of Understanding between Standards Australia and Standards New Zealand, Australian/New Zealand standards are prepared by committees of experts from industry, governments, consumers, and other sectors. The requirements or recommendations contained in published standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian/New Zealand standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

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Standards Australia and Standards New Zealand are responsible for ensuring that the Australian and New Zealand viewpoints are considered in the formulation of international standards and that the latest international experience is incorporated in national and joint standards. This role is vital in assisting local industry to compete in international markets. Both organisations are the national members of ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission).

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