

Category 1 Standard

S1200 Signalling and Signalling Control - Alterations to Systems

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1 Purpose

- 1.1 The purpose of this Standard is to define the requirements applicable to the making of planned alterations to hardware or software during the life of a Signalling System.

2 Scope

- 2.1 This standard applies when making any planned change to the safety signalling system for which LU is the Infrastructure Controller where that change involves either:
- a) a departure from the existing design; or
 - b) a change of component type or version.
- 2.2 This standard also applies to any interfaces (such as power supplies, arrestors or point heaters) whose alteration might directly affect the safe operation of the signalling.
- 2.3 The requirements of this standard generally do not apply to exact like-for-like substitution of components, but shall apply (in whole or in part) if extensive and simultaneous like-for-like replacement or reinstatement is planned, even where this does not depart from the existing design drawings.
- 2.4 The requirements of this standard are to be considered when planning the alteration of Signalling Control Systems.
- 2.5 This Standard is written in terms associated with hard-wired systems but is to be applied to data driven and other software based systems as appropriate.
- 2.6 This standard does not address the safety assurance or design approval process required for new types of equipment (refer to Standards S1197, Signalling and Signalling Control – Design and Implementation and S1201, Signalling and Signalling Control – Approvals), or the detailed planning and documentation of testing (refer to Standard S1198, Signalling and Signalling Control – Installation, Testing, Commissioning and Handover). However, the totality of requirements contained within the complete suite of Signalling and Signalling Control Standards, see 5.1.2, are to be complied with as appropriate for the planned change.

Note 1: For requirements associated with Routine Change and other maintenance-related topics see Standard S1199, Signalling and Signalling Control – Operation and Maintenance.

Note 2: For requirements associated with the overhaul of signal equipment see Standard S1202, Signalling equipment overhaul.

- 2.7 The Standard has been re formatted and re-numbered from 1-200 A2. There were no technical changes.



3 Requirements

3.1 General Requirements

3.1.1 Changes to the Signalling System shall be controlled to safeguard the operational safety and performance of the railway, and the personal safety of staff and customers.

3.1.2 All planned changes, whether temporary or permanent, shall be carried out in accordance with this Standard.

Note: Urgent unplanned temporary changes (to provide service in the event of failure conditions) will normally be carried out in accordance with the process for irregular adjustments to the signalling system (see Standard S1199, Signalling and Signalling Control - Operation and Maintenance), but may be carried out in accordance with this standard if all its requirements can be met.

3.1.3 The key requirements of this standard are:

- a) confirmation of the existing 'as built' records before making any physical change;
- b) formal definition of the change by means of authorised drawings or documents;
- c) the controlled release (or 'issue') of these documents by the Design Authority;
- d) planning the execution of the work;
- e) authorisation and certification of the physical task;
- f) physical 'proving' of the changes as they are made;
- g) independent principles test of any change;
- h) updating of records;
- j) competence of personnel (licensing).

3.1.4 Where extensive and simultaneous like-for-like replacement or reinstatement is planned, even where this does not depart from existing design drawings, the requirements of this standard shall be applied, except when agreed with the Asset Engineer or his delegated representative.

Note 1: 'Extensive and simultaneous' like-for-like works would typically include signalling works associated with track works or bridge replacement, or when the signalling system has been out of use for an extended period of time.

Note 2: The routine change of line replaceable units requiring no disconnection of the wiring are covered by the requirements in S1199, Signalling and Signalling Control - Operation and Maintenance rather than by the requirements of this standard.

3.1.5 Where equipment capable of reuse is planned to be made redundant, disposal shall be agreed by the Head of Engineering. Such equipment shall be safeguarded from physical damage.

Note: It is in the interest of the Supplier to agree this with LU at an early stage of any Project.



3.2 Alterations to Signalling Systems

Section 3.2.1 to 3.2.7 shall be read in conjunction with Attachments 1 to 7 respectively, which provide detailed requirements and permitted exceptions. Attachments 1 to 7 are part of this standard.

3.2.1 Confirmation of 'as-built' records

No changes shall be made to an existing signalling installation until the relevant 'as built' record documents for that installation have been confirmed to be correct.

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 1

3.2.2 Specifying the alteration

No changes shall be made to:

- a) wiring terminations;
- b) trackside physical dimensions;
- c) electrical or mechanical component types or versions;
- d) signs conveying operational information;
- e) installed system software or site data;

except in accordance with properly authorised 'modification' drawings (or equivalent documents for software) issued by the Design Authority for the system concerned.

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 2.

3.2.3 Planning and preparing for the alteration

Planned alterations shall only be made to the signalling system if:

- a) the work is carried out in accordance with a Commissioning Quality Plan (CQP), prepared and approved in accordance with the CQP process (see Standard S1198, Signalling and Signalling Control - Installation, Testing, Commissioning and Handover);
- b) all appropriate pre-testing has been satisfactorily completed, and is documented in accordance with the requirements of Standard S1198, Signalling and Signalling Control - Installation, Testing, Commissioning and Handover;
- c) the Asset Steward (and maintenance contractor where different) has been given adequate notice and information concerning the work and has raised no objections;
- d) suitable arrangements have been made to notify LU Operations of changes that affect them.

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 3.

3.2.4 Independent testing of principles

Any changes made to:

- a) wiring terminations;



- b) trackside physical dimensions;
- c) electrical or mechanical component types or versions;
- d) installed system software or site data;
- e) sighting of a signal;

shall be subjected to a principles test, independent of the designer, before entry into service (see Standard S1198, Signalling and Signalling Control - Installation, Testing, Commissioning and Handover).

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 4

3.2.5 Task authorisation and certification

For any change to the signalling system:

- a) a single person - the Tester in Charge (TiC) - shall be appointed to take overall responsibility for ensuring that the signalling system has been restored to a safe and operable condition following the alteration;
- b) the task of executing the alteration shall be sanctioned before commencement by the issue of an Authority to Work Certificate (AWC) to the TiC in accordance with the AWC process;
- c) correct operation of the signalling shall be certified on completion by the TiC completing and signing off the AWC;
- d) the TiC shall not permit any signalled train movement within the area of interference between the start of the task and the signing of the AWC.

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 5.

For details on the AWC procedure see Standard S1201, Signalling and Signalling Control - Approvals.

3.2.6 Proving of wiring alterations

Any wire or cable being added to or removed from any terminal of the signalling system in the course of an alteration:

- a) shall be 'proved' from end to end at the time of its termination or removal, in accordance with Standard S1198, Signalling and Signalling Control - Installation, Testing, Commissioning and Handover;
- b) shall be subject to an independent wire count of its terminations prior to entry into service, in accordance with Standard S1198, Signalling and Signalling Control - Installation, Testing, Commissioning and Handover.

Note: For detailed requirements and permitted exceptions relevant to the above clause see Attachment 6.

3.2.7 Updating of records

3.2.7.1 The process of amending the 'as built' records to reflect the actual state of the railway shall be planned and executed as an integral part of the alteration work, and shall include:

- a) updating the site copy documents before leaving the site of work;



- b) provision of updated copies for the Maintainer's technical staff, and for the Design Authority's records, in readiness for the start of traffic following the alteration, and for other controlled copy holders in due course;
- c) provision of updated Traffic Controller's diagrams for the LU Operator in readiness for the start of traffic following the alteration, and for other controlled copy holders in due course;
- d) provision of information to update the master asset database.

3.2.7.2 A definitive asset listing of all equipment planned to be made redundant shall be supplied in accordance with Standard 1-041, Engineering Asset Records.

Note: For detailed requirements and permitted exceptions relevant to the above clauses see Attachment 7.

3.2.8 Competence of personnel

Alterations to the signalling system shall only be carried out by persons who are competent in the particular task concerned. For details on competence requirements see Standard S1203, Competence of personnel working on signal and signal control systems.

3.3 Remedial works to replace degraded wiring

Note: For details on the management of degraded wiring see Standard S1199, Signalling and Signalling Control - Operations and Maintenance.

- 3.3.1 Where degradation has occurred that is considered a risk to the safe operation of the signalling the Supplier shall, following the localised making safe, carry out a design review to:
 - a) identify prime critical circuits; and
 - b) establish the risks and determine whether any additional engineering defences are necessary before undertaking any re-wiring works.
- 3.3.2 Following a risk assessment, the Supplier shall determine the extent of any rewiring required.
- 3.3.3 The risks of disturbance during the correlation of the design to the 'as built' status of the installation shall be evaluated, and the re-wiring methodology shall take this into account.
- 3.3.4 The Supplier shall document the re-wiring methodology in advance of the works. This shall take account of design, correlation and testing activities.
- 3.3.5 Unless otherwise agreed with the Asset Engineer:
 - a) All disconnected wires shall be removed from the installation;
 - b) Removed wires shall be retained for scientific analysis.
- 3.3.6 Any degradation shall be categorised against known modes of degradation and any new modes shall be subject to scientific analysis.



3.4 Evidence of Compliance

- 3.4.1 Compliance with the requirements of this Standard shall be demonstrated to LU by each party contracted to LU. Additionally, LU may audit compliance as part of its surveillance regime.

4 Responsibilities

The **Asset Engineer** is the accredited professional engineer in Tube Lines or London Underground who has delegated authority for discharging safety and acceptance responsibilities on behalf of the Professional Head of Signalling. Asset Engineers ensure that:

- a) systems and equipments are compliant with standards;
- b) the associated processes are compliant with standards.
- c) asset information is recorded.

These responsibilities are discharged either directly or through accredited representatives.

The **Asset Steward (and Maintainer where this is different)** is responsible for:

- a) co-operation with designers, installers and project managers to facilitate the implementation of authorised alterations;
- b) secure and timely handling of the revised 'as built' controlled copy records;
- c) acceptance of new assets for maintenance, and their integration into an appropriate maintenance regime.

The **Professional Head of Signalling** is the person within LU with responsibility to:

- a) determine the technical contents of the Standards;
- b) advise on the correct interpretation of and approval of concessions to the Standards;
- c) resolve any conflicting issues with Standards and other related safety matters;
- d) ensure that an appropriate level of surveillance of compliance to standards is undertaken.

The **Design Authority** is responsible for the adequacy of the design for a system or a piece of equipment. The Design Authority ensures that:

- a) designs and documentation meet standards;
- b) designs are authorised before release for Installation;
- c) issues raised during installation and testing are correctly addressed.

The **Designer** is responsible for the production of the designs and documentation, ensuring that they are technically correct, clearly presented, appropriate for the particular application and compatible with corporate objectives for safety, economy and operational performance.

The **Supplier** is responsible for:

- a) ensuring compliance with standards is clearly specified as a requirement for all work on the Signalling and Signalling Control Systems;
- b) ensuring appropriate arrangements and resources are applied to the supply;