



EEA SAFETY RULES NEWSLETTER

APRIL 2001

1. Introduction

When SR-EI and GSG-EI 2000 were published, commentaries on the amendments incorporated in these books were put on the EEA website.

This Safety Rules Newsletter has been prepared to provide further background to some of the requirements of the books. It deals with:

- Personal Fall Arrest Systems (PFAS)
- Crane safety publications
- SR-EI Rule 712 and GSG-EI Rule 705: Mobile plant and vehicles in the vicinity of live conductors
- Notification when using supplied air respirators
- SR-EI rule 412: Recipient responsibility for safety: Principles
- Energising equipment under test
- The use of insulating gloves when earthing
- Earthing for work on HV Electrical Equipment: SR-EI Rule 602k.

2. Personal Fall Arrest Systems (PFAS)

SR-EI rule 1007 and GSG-EI rule G1007 both deal with the application of personal fall arrest systems.

Sections 1007c. and G1007b. of these rules state that the requirements and recommendations of AS/NZS 1891.4 *Industrial Fall Arrest Systems and Devices Part 4 : Selection Use and Maintenance* should be followed once it is published. This Standard has now been published.

Developments since the rules went to press, including the publication of the Standard, do not require changes to the rules. However, to help employees keep up to date with developments and to provide more space for dealing in detail with PFAS requirements, an EEA Technical Guide "Use of Personal Fall Arrest Systems" is being developed and should shortly be available.

3. Crane Safety Publications

GSG-EI rule 701 General, lists three publications that were not available at the time the text was finalised. There are also references to the first of the publications in other rules e.g. G703, G708.

The current position with these publications is as follows:

(i) Approved Code of Practice for Cranes

Section b.i. of the rule refers to the expected availability of OSH publication *Approved Code of Practice for Cranes*. The Code covers design, manufacture, supply, safe operation, maintenance and inspection of cranes.

Copies are now available in ring binder format, either from OSH service centres or they can be ordered from Julie Watterson of OSH Wellington, phone 04 915 4317, at \$25 (incl.GST) per copy, plus postage and handling. Copies should also be able to be downloaded from the OSH web site www.osh.dol.govt.nz

(ii) Approved Code of Practice for Load Lifting Rigging

Section b.ii. refers to the OSH publication *Approved Code of Practice for Load Lifting Rigging* being available in the second half of 2000. The current estimate for the publication date is by the end of May 2001.

(iii) Crane Safety Manual for Operators/Users

Section b.iii. refers to the Power Crane Association of New Zealand (Inc.) publication *Crane Safety Manual for Operators/Users* 1989 being out of print but due for publication in the second half of 2000. This new 2000 edition is now available. The manual is jointly promoted by the Power Crane Association and Occupational Safety and Health.

The introduction to this new edition includes the following wording:

“This manual now reflects the latest technology and highlights relevant new Regulations and Codes of Practice. It illustrates in a simple form the basics of crane operation and safety together with other relevant useful information”.

As well as dealing with cranes, the manual includes sections on load lifting tackle and rigging equipment, also wire ropes.

The new manual is available to PCA members for \$20 (incl.GST) plus postage/courier and to non members for \$30 (incl..GST) plus postage/courier.

Copies may be obtained by contacting:

Ian Grooby
Chief Executive
Power Crane Association of New Zealand (Inc)
PO Box 30 074
Lower Hutt
Phone: 04 569 9799, Fax 04 569 696, Email: pca@xtra.co.nz

4. SR-EI Rule 712 And GSG-EI Rule G705: Mobile Plant And Vehicles In The Vicinity Of Live Conductors

In revising the safety rules dealing with minimum approach distances for mobile plant, SR-EI rule 712 and the identical rule G705 in GSG-EI, the aim was to set out requirements clearly and in a way consistent with the intent of the regulations and ECP34. It was accepted that the wording of the rules and the regulations was not identical.

A contractor has recently pointed out that there is a difference between the requirements of the safety rules and the regulations and his comments were considered at the meeting of the Safety Strategy and Policy Group held on 21.12.00. Following this meeting, the comments were discussed with a representative of the Ministry of Consumer Affairs (MCA), the Government Department that administers the Electricity Regulations.

The outcome is that it was agreed that the following statement of requirements and recommendations would be circulated in the industry.

- (i) When the owner of the live conductors gives approval for work in accordance with paragraph ii. of the table associated with rule SR-EI 712c. and GSG-EI rule G705c., this approval must be in writing.
- (ii) For work in accordance with paragraph iii. of the table associated with the rules referred to above, MCA recommend that each specific request to a line owner be in writing. The line owner must then give each applicant the permission (or decline the application) in writing for each specific case as required by paragraph iii. of the table.

By this action, in particular that set out under 1. above, the requirements of Regulation 93 (2) of the Electricity Regulations 1997 are complied with.

The process as set out in 1. above will be included in the next revision of the rules.

5. Notification When Using Supplied Air Respirators

When GSG-EI text was prepared it was understood from OSH that notification of the use of compressed air was required only when diving. Rule G907 Diving, in section a., sets out this requirement for notification.

More recently OSH have made it clear that such notification is required for any construction work where a supplied-air respirator using compressed air is used, e.g. in confined spaces, when abrasive blasting.

References to the use of a supplied air respirator are in rules G 407, G 409, G 504, G 801, G 803, G 804, G 805, G 902, G 903, and G 1005.

However, notification is not required for such work on existing generating plant, which OSH does not regard as construction work. (This is stated in GSG-EI Appendix A Section 1. last sentence).

In the next edition of GSG-EI, wording will be reviewed to ensure that the position set out above is made clear.

6. SR-EI Rule 412: Recipients Responsibility For Safety: Principles

The July 2000 edition of SR-EI attempted to clarify the role of the recipient for supervision of work under a permit. See Section 3 Background, paragraph a., rule 412, and the note at the end of rule 504.

The Safety Strategy & Policy Group recently considered the principles applying to SR-EI rule 412 and compiled the following list.

- There is a chain of continual relationships when a permit exists, ie person having operational control to issuer to recipient to supervisor(s) to work party(ies).
- The permit is a “contractual agreement” between the issuer and the recipient, under which the equipment is handed over to the recipient in a defined state. This defined state includes the equipment being isolated.
- The permit is issued with the main isolations applied, as the first step in making equipment safe to work on.
- When work is taking place there must be a supervisor controlling each work party.
- The recipient is the supervisor of any work party working under their permit, unless another supervisor(s) is/are appointed. Where possible the recipient retains the supervisory duties, appointing a separate supervisor only when necessary, eg multiple work parties.
- The recipient retains control over any supervisor for issues associated with the permit or the management of safety associated with the permit.
- Any supervisor appointed must meet competence criteria at a level consistent with those of a recipient.

The Group also decided to invite comments on the above list. If you have any comments, please send them to the Executive Director, Electricity Engineers' Association of NZ (Inc), PO Box 5324, Wellington. Email: admin@eea.co.nz.

7. Energising Equipment Under Test

SR-EI deals with three situations where equipment may be electrically energised for testing. In each situation the equipment is energised in terms of the SR-EI definition but the term energised is used in rule 1002 only.

Because the requirements for the various situations are dealt with in different places in SR-EI, this note has been prepared so that they can be seen alongside one another.

1. Rule 505 Limited Testing Permissible Under an Access Permit, allows such testing using test equipment with insufficient capacity to cause harm. The equipment being tested is under an access permit and hence, by definition, is isolated.
2. Rule 511 Basic Test Permit Requirements, in section a. states that a test permit authorises the recipient to test specified isolated equipment and allows the following actions -run/operate/energise defined equipment.

The test permit definition deals with access to equipment that has been isolated and that is emphasised by the repetition of the word isolated in rule 511a. That is, rule 511 does not deal with energising from the power system.

3. Rule 1002 Testing for Which a Test Permit is not Required, in section a. explains the type of situation to which the rule applies.

Section b. deals with test livening from the power system. It requires that the test livening be carried out in accordance with procedures agreed by the asset owner.

In each of these three situations, the rules set out the requirements necessary to avoid harm to employees.

8. The Use Of Insulating Gloves When Earthing

There are two places in SR-EI which refer to the use of insulating gloves when carrying out earthing. They are:

1. SR-EI Rule 1009g.iii. states that insulating gloves shall be used when putting on or taking off manually connected temporary earthing and bonding connections, except where the employee is adequately insulated.
2. SR-EI Appendix B section 1. states that insulating gloves of appropriate voltage grade shall be worn when applying or removing portable earths and when using a voltage detector.

Rule 1009 g.iii. requirements reflect the requirements of Electricity Regulation 36(4)(c). Appendix B section 1. requirements goes beyond the requirement of the Regulations.

The requirements in the rules differ, because in distribution work, the consistent use of insulating gloves where gloves may not be strictly necessary for safety e.g. when using adequately insulated portable earths and voltage detectors, helps to ensure that they will be used when they are necessary. In other words the use of insulating gloves becomes a habit that contributes to safety. Examples of situations where gloves are necessary are when the insulation of portable earths is inadequate or when there could be unacceptable touch potential when operating disconnectors because the employee is not standing on an equipotential surface.

For the NZ transmission system, adequate insulation is required for portable earths and installation designs avoids the possibility of unacceptable touch voltages when operating circuit breakers. Also station earthing systems designed by Transpower and its predecessors have been designed to limit touch voltages at positions where disconnectors and earth switches are operated.

To sum up, the differences between the rule requirements for the use of insulating gloves on distribution and transmission work reflect the differences between design and operational practices for these two sectors of the industry.

9. Earthing for work on HV electrical equipment: SR-EI Rule 602k

9.1 Introduction

Rule 602k. has been amended in the latest issue of the Safety Rules-Electricity Industry, to clearly set out the principles to be followed when applying temporary earths to HV conductors for safe working on equipment that has been removed from service.

These notes have been prepared to provide some background to the approach taken in Rule 602k. and to explain the relationship of the rule to the Electricity Regulations 1997 (the Regulations) and also to field procedures.

9.2 Background to Revision of Rule 602k

Rule 602k. had previously been a prescriptive rule. Situations had arisen where varying interpretations over its application had been identified. Therefore Rule 602k. was re-written to re-state the principles contained in the Regulations and to expand on those principles in terms which are familiar to, and commonly used within, the electricity industry.

9.3 Electricity Regulations - Temporary Earthing Requirement

Regulations 32 & 33 state the basic principles which must be met in all situations. The essential core of the Regulations is that earths must be applied to conductors, which have been disconnected from supply, to prevent any person working on the conductors from being exposed to any significant risk of electric shock or injury. This is irrespective of how voltage may be introduced into those conductors.

9.4 Principles in Rule 602k.

Rule 602k. begins with a statement of the basic principle: "Earths shall be applied to HV conductors so as to eliminate hazard from any cause that could liven equipment under a permit". The causes, as described in Rule 601, range from inadvertent connection to HV supply, to induction from nearby in-service circuits.

The 3 paragraphs of Rule 602k. which follow, expand on the basic principles from the Regulations to ensure all situations are safe by being adequately protected by the application of temporary earths.

These principles require sufficient earths to be applied to:

- (a) suit the layout of the interconnected circuits at each particular work site
- (b) provide for a wide range of maintenance activities e.g. disconnection/dismantling of equipment, replacement of bushings
- (c) ensure employees remain protected at all times while undertaking work activities on or within the relevant minimum safe approach distance of conductors
- (d) provide effective bonding across any conductor breaks which may be needed during the work (note that earthing on both sides of a worksite to a common station earth mat or to the same steel structure, readily provides bonding across conductor breaks)
- (e) prevent hazard from causes such as induction from nearby conductors if, for example, a section of busbar is being replaced at an in-service station.

The notes associated with Rule 602k. provide guidance on the application of the above principles -

- (a) in situations where there are several points of isolation relevant to the work position,
- (b) for dealing with high impedance equipment which may be present between HV conductors and earth.

When earthing is required for work on overhead lines, cables, capacitor banks, etc., additional requirements apply and are detailed in the relevant rules.

9.5 Operating Procedures and Field Service Specifications

Because of the approach taken in the amended Rule 602k. it will be necessary for operating procedures and field service specifications to be prepared to suit specific situations that are not straight forward.

9.6 Equipotential Bonding and Equipotential Zones

Both the terms "equipotential bonding" and "equipotential zones" are sometimes used when describing earthing procedures. This section explains these terms and how they relate to SR-EI earthing procedures.

In N.Z. Electrical Codes of Practice and in NZS 3000 equipotential bonding is described variously as:

- connecting metal parts so that they are at substantially the same voltage;
- minimizing the risk of voltage differences between accessible parts of electrical equipment;
- minimizing the risk of electric shock to persons by the limitation of step and touch voltages to safe values.

Some overseas authorities require sufficient earths to be applied at the work permit area to establish an equipotential zone

An equipotential zone is established at the work position by connecting together all conductors entering the work permit area. In this zone no significant potential differences can develop between conductors if reconnection of HV supply occurs. The conductors should also be connected to earth.

At stations, components such as bushings or lengths of busbar disconnected from earthed conductors (during work) and within the equipotential zone cannot be exposed to hazardous voltages from inadvertent reconnection of HV supply. However, in some situations, when they are exposed to induction from nearby in-service equipment, these items may need to be connected separately to the station earth or to the conductors of the equipotential zone.

The application of earths as required by Rule 602k. ensures the establishment of such an equipotential zone. This results in the elimination of any hazard to employees if an inadvertent reconnection of HV supply occurs.

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