Whole current fuse sizing and cable sizing guidance

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Change History

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1.2	Draft	27 August 2013	Further draft
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1. Introduction

1.1 Purpose

This document captures the outcome of discussions by MOCOPA Parties on the appropriate relationship between cut-out BS88-3 fuse system C[1], and the cables between cut-out & metering equipment ('meter tails'); and metering equipment & consumer's equipment ('customer tails').

Work with Electrical Safety First has confirmed that a 100A fuse provides adequate protection against short circuit for 16mm^2 copper PVC insulated / PVC sheathed tails. If it can be confirmed that the site has not been subject to overload in the past then the existing fuse/tails combination may be left in situ as found, with the provision that the customer must be advised that they should not add any additional load without advice from a qualified electrician.

2. Risk assessment process for tail/fuse rating mismatch

2.1 Scope

This process applies exclusively to existing whole current metered Sites where either the 'customer tails' and/or the 'metering tails' are 16mm^2 cross sectional area and the Distribution Business fuse is rated at 100A. The process allows for 16mm^2 'tails', protected by a 100A fuse to be left in situ, subject to successfully passing an 'on-site risk assessment'.

On new Sites fused at 100A, MOCOPA Operators will use 25mm^2 'meter tails' and would require that 25mm^2 'customer tails' are provided by the customer's electrician, failing which the MOCOPA Operator would refuse to energise the supply with the 'customer tails' connected, or may choose to wire to a double pole isolator.

In instances where the Meter Operative identifies that the Distribution Business fuse is rated at 80A, 'customer tails' of 16mm^2 cross sectional area are considered to be adequate.

Where the cut-out will not accept 16mm^2 or 25mm^2 cables then the meter change should be aborted and the defect reported to the Distribution Business, in accordance with guidelines for reporting under data flows D0135/D0126. Nothing in this document restricts a Meter Operator upgrading the 'tails' to 25mm^2, where they choose.

2.2 Meter Operator process at time of metering work

2.2.1 Checks

On finding a Site with a cut out containing a100A fuse and with 16mm^2 'tails' in situ, the Meter Operative should:

- Confirm the 'tails' are 16mm^2 copper, or greater, cross sectional area; and
- Confirm the type of insulation and sheathing on the 'tails'. Only PVC insulated / PVC sheathed cables are permitted in this process. VIR (and similar) insulation are specifically excluded; and

[1] http://electrical.theiet.org/wiring-matters/2011.cfm (see Issue 38, Spring 2011)

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- Carefully examine the 'tails' for any signs of overheating, softening or insulation migration, both adjacent to the terminals and along their length, giving particular attention to any tight bends; and
- Carefully examine the consumer unit and/or main switches, visually, looking for any signs of overheating, softening of the casings, smoke damage etc.; and
- Be aware of any smell from the equipment commensurate with overheating; and
- Confirm that the total length of 'meter tail' and 'customer tail' from cut-out to consumer unit is less than three metres in length.

2.2.2 Passes the checks

Providing there are no adverse indications, the Meter Operative can deduce that the existing 'tails' are not at risk of being overloaded by the prevailing pattern of use on the site. In accepting this situation, it is essential that the customer be informed, in writing[2] , that:

- The customer's electrical intake equipment has been inspected and the 'customer tails' are considered to be 'not to current standards'; and
- The customer's supply has been re-connected on the basis that there were no obvious signs of past overload at the time of inspection; and
- The customer should be aware that the 'customer tails' could be overloaded if the connected load increases in the future, with a possible risk of overheating or fire; and
- That the customer should consult a qualified electrician before connecting any significant additional load.

2.2.2 Fails the checks

In all other circumstances (tails less than 16mm^2, not PVC insulated /PVC sheathed, signs of overload, etc.) the Meter Operative should provide and fit a double (or four) pole isolator connected with 25mm^2 tails from the Metering Equipment. If safe to do so, the Meter Operative should then re-terminate as many of the 'customer tails' as is safe in the isolator, using a connector block as appropriate. The customer should then be advised, in writing[3], that the 'customer tails' are undersized and/or inadequate construction and should be upgraded by their electrical contractor.

2.3 Distribution Business process at time of fuse change

The Distribution Business may attend Site to replace a failed fuse or to upgrade (to 100A) a fuse at the request of a customer. The on-site risk assessment described above is not appropriate in these circumstances as the customer load may have, or is intended to be increased.

The fuse rating can be increased to 100A only when the 'meter tails' and the 'customer tails' are already 25mm^2 copper PVC insulated /PVC sheathed.

When the 'meter tails' and the 'customer tails' are not already 25mm^2 copper PVC insulated /PVC sheathed, then:

- they should not proceed with a fuse upgrade to 100A, or
- where responding to a failed 80A fuse, the fuse should only be changed for another 80A fuse.

[2] See model customer checklist, MOCOPA, Appendix 12
[3] See model customer checklist, MOCOPA, Appendix 12

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The Distribution Business should advise the customer to avoid connecting load which may exceed 80A and to contact his Supplier (for 'meter tails') and/or electrician (for 'customer tails') to arrange for the tails to be upgraded. Once this is complete they can request the Distribution Business to upgrade the fuse to 100A.

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3. Appendix

3.1 Background

A MOCOPA working group was established with a range of MOCOPA Parties, with participation from Electrical Safety First (ESF) and the Health and Safety Executive (HSE). Certain assumptions were agreed:

- This guidance was focused on whole current metering installations only, i.e. those protected by up to 100A cut-out fuses;
- This guidance covers only the main load carrying conductors, not the supplementary wiring for communications equipment, contactor control, etc.;
- Irrespective of this general guidance it is the responsibility of the party at site to ensure that they have discharged their obligations under law to maximise safety in the particular circumstances encountered on site.

3.2 Alternatives considered

A wide range of approaches was considered, including: fitting supplementary in-line fuses, using a smart meter to load limit, change fuse characteristics and fit a switch-fuse on the customer's side. These were all considered and discounted for various cost and operational reasons. Minutes of the sub-group meetings are available from MOCOPA and give further details. The principal options taken forward for in depth discussion were:

1. Meter Operative down-rates the Distribution Business cut-out fuse to match the capability of the tails;
2. Meter Operative upgrades the meter tails and fits an isolator on the customer's side of the meter, to facilitate replacement of the customer tails without further Meter Operative involvement;
3. Meter Operative carries out a risk assessment to determine whether the customer's tails have been overloaded in the past. If satisfactory they can be left in place with a warning to the customer against installing any additional load.

3.3 Way forward

Whilst favoured by MOCOPA Operators, Option 1 was ultimately discounted because the majority of Distribution Businesses were not willing to allow the fuse sizes to be reduced.

Similarly, Option 2 was discounted by MOCOPA Operators because, unless the customer acts to replace his tails, it achieves little while being expensive for the MOCOPA Operator.

Given the above, the group opted for the alternative approach of Option 3 which would allow the existing fuse/wiring to remain in situ subject to a site specific risk assessment.

The basis of this approach is that

a) a 100A fuse has been shown to provide adequate short circuit protection for 16mm^2 meter tails; and

b) if there are currently no signs of overheating on the existing installation and the customer is advised not to increase his load then the existing installation should continue to be satisfactory.

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