SMART METERING IMPLEMENTATION PROGRAMME: CONSULTATION ON DRAFT LICENCE CONDITIONS AND TECHNICAL SPECIFICATIONS FOR THE ROLL-OUT OF GAS AND ELECTRICITY SMART METERING EQUIPMENT (AUGUST 2011)

The Electrical Safety Council response to the parts of above consultation relevant to electrical safety is as follows:

Consultation Questions	
47.	Do you have any views on the options presented to ensure that electrical contractors can work safely and efficiently between the electricity meter and the consumer unit/fuse box? Please provide evidence to support your reasoning.

As the author of the business case referred to in the text accompanying this question (and appended hereto), the Electrical Safety Council does indeed have views on the options presented.

We continue to strongly recommend the acceptance of either of the engineering solutions given as options 1 and 2 in the consultation document, not only in the safety interests of electrical contractors and electricians, but also in the safety interests of consumers.

We are surprised and concerned that, on the basis of the evidence and robust case presented to date, the Government does not believe that sufficient benefits have been identified to justify the additional costs that would be incurred by amending the functional requirements to include an isolating switch in smart meters.

We believe the situation would have been different if OFGEM and subsequently DECC had acted upon the ESC" s request to seek the equivalent qualitative and
quantitative evidence from the electricity supply industry to contrast with the detailed evidence provided by the electrical installation industry. For example, it could then have been substantiated that the vast majority of 400,000+ temporary disconnections needed each year are currently effected by electricians for the reasons set out in the business case, and that the cost to consumers of having electricity suppliers/meter operators effecting temporary disconnections is disproportionate.

We would also reiterate the points we made when our business case was initially rejected by DECC:

Significant investment

The investment would be small in relation to the overall cost of the smart meter programme, the future savings in energy costs for consumers claimed by DECC, and all the other benefits set out in our case. On the other hand, the dividends would be significant and long lasting.

Most consumers will not see any benefit

Over the minimum 15 year life of a smart electricity meter, over 6 m households –
that" s around 25% of all households - would benefit significantly from having an
isolating switch in their meter, in terms of cost and convenience. The longer the life of the meter, the more would benefit.

Level of safety risk

The single-pole isolator options were included in our case in order to minimise costs. They would provide no lesser degree of safety than the only other means of isolation currently available – withdrawing the cut-out
fuse.

The „ last gasp" alarm, which will potentially prevent the unauthorised removal of cut- out fuses in future, is likely to drive many more electricians to work live on the installation side of the meter in order to avoid the added administrative, time and cost burdens on their business of having to deal with the supplier/meter operator or register with a scheme, and to avoid the significant additional costs to their customers which could significantly affect their competitiveness.

Home safety deterrent

In addition to the impracticality of suppliers/meter operators providing a temporary de-energisation service to suit the needs of electricians and their customers, the cost of the alternatives available from suppliers/meter operators (such as £130 to have an isolator installed between the meter and consumer unit or £75 per visit to withdraw or replace a cut-out fuse) is disproportionate in relation to the cost of replacing a consumer unit. This would deter many householders from upgrading the level of protection in their homes with RCDs etc, potentially resulting in more deaths, injuries and fires than would be the case if an engineering solution was adopted.

Justified with hard evidence

All hard evidence available to the electrical installation industry was provided with the business case in June.

Conversely, Ofgem did not act on the ESC" s request last November to obtain equivalent hard evidence from the electricity supply industry. Had such qualitative and quantitative evidence been gathered as requested, it would no doubt have greatly supported the case for an engineering solution to be adopted. We believe the suppliers/meter operators would have struggled to justify their part in the ongoing

industry problem.

Business as usual

It is appreciated that the raising of this isolation issue is likely to have been unwelcome in the context of such a complex programme. However, with the advent of the last gasp alarm in smart meters, there will be no „ business as usual
‟ .

The decision not to adopt any of the engineering options given in our case could be perceived to be anti-competitive, as it will drive electricians who wish to work safely and legitimately either to pay for the services of electricity suppliers/meter operators, or to pay to join a registration scheme potentially authorised and controlled by them – all the costs of which the electricians will need to recover from their customers.

Previous efforts to introduce a registration scheme have been blocked by the electricity supply industry. There has been no indication that their stance will change. Their other efforts to improve the situation – for example by providing adequate
information for electricians on their websites – are discredited.

To force electrical contractors down the registration route would seem to be contrary to the Government‟ s expressed intent to reduce regulatory burdens on small
businesses.

The Electrical Safety Council urges DECC to reconsider their current stance on this significant issue, which we believe does not take into consideration the overall picture that extends beyond the smart meter programme.

Consultation Questions	
45.	**Do you think that the prepayment meter contactor switch should be utilised to protect consumer premises from "floating neutral" network faults? Please provide evidence on the costs and benefits to support your reasoning.**

The Electrical Safety Council supports the proposal the use the contactor in the meter, in conjunction with an appropriate voltage sensing device, to provide a measure of protection against over-voltage for household electrical equipment in the event of the combined neutral and earth conductor in a PME supply network becoming open-circuit. Such a measure could significantly reduce the extent and cost of damage to connected household electrical equipment, and of the associated fires.

An indication of the costs and benefits that could be provided by such a protective measure was given in the Parliamentary debate on the subject of metal thefts on 6 September 2011:

(www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110906/debtext/110906-0005.htm#11090710002395)

For example: " *These thefts have led to 750 cases of loss of supply to at least*
25,000-plus homes. Of these there were over 2,500 cases involving damage to

customer's TVs, computers and boilers as a result of the outages. In addition there have been 23 environmental incidents and at least 60 fires. A recent theft in Yorkshire cost local residents and insurers over £500,000 in broken electrical equipment and boilers as a result of a theft of just £40 of copper when customers' voltage rose from 240 V to a dangerous 430 V.
"

However, such use of the contactor could not prevent the exposed- and extraneous-conductive-parts in the metered property attaining a dangerous voltage relative to Earth. Thus it would provide no protection against the risk of electric shock from all the normally earthed exposed metalwork in and around homes (such as the metal enclosures electrical appliances, metal pipework, electric gates, electric vehicles and the like).

Appendix: The case for providing a means of isolation in smart meters (28 June 2011)

28 June 2011

THE CASE FOR PROVIDING A MEANS OF ISOLATION IN SMART METERS

Introduction

The Smart Meter programme presents a once-in-a-lifetime opportunity to address a longstanding electrical safety issue across Great Britain. This issue concerns the temporary de-energisation of electricity supplies to domestic and similar premises to enable electricians to safely carry out certain electrical installation work, including the replacement of consumer units (fuse boxes). It is estimated that over 400,000 temporary de-energisations need to be made each year for this purpose.

Current options

At the present time, there are four options for electricians when carrying out work for which temporary de-energisation of the supply is necessary:

1. Arrange for the cut-out fuse to be withdrawn (and later replaced) by the meter operator
2. Arrange for the meter operator to install an isolator between the meter and the consumer unit
3. Remove and replace the cut-out fuse themselves
4. Work live.

Options 1 and 2 are currently the only ones recognised[1] by electricity suppliers, meter operators and distributors.

Despite some effort made by suppliers to improve the availability and level of service, Option 1 is generally considered to be impractical in terms of time, effort and normal domestic electrical installation working practices, at least in the electricians' competitive, commercial world.

With regard to Option 2, if the isolator is not installed at the same time as a meter, the cost to the property owner can be around £130 which, compared with Options 3 and 4, is not particularly attractive to either electricians or property owners.

Option 3 is believed to be by far the most common approach currently taken by electricians though this is not without risk, especially where the service head is metallic.

Option 4 carries a significant safety risk to the electrician, and is likely to be in direct breach of the Electricity at Work Regulations 1989 and the Health and Safety at Work etc Act 1974.

Assumptions

- The number of smart electricity meters to be installed during the programme – 28 million
- Service life of smart electricity meters – at least 15 years
- Number of temporary de-energisations required in Great Britain by electricians – at least 400,000 per year.

[1] www.dcusa.co.uk/Public/ViewDocument.aspx?id=2303

Possible future options

Option A – Modify the design of the currently-specified single-pole 'remote disablement switch' in the smart meter to permit manual isolation by an electrician

Benefits:

- Good, safe, engineering solution
- No less safe means of isolation for electricians than is currently achieved by withdrawing the cut-out fuse
- Cut-out fuse secure and unaffected
- Takes advantage of the switching facility already allowed for in the smart meter specification
- Likely to cost significantly less than a separate integral isolating switch (Option B)
- Significantly less costly than Option C (separate isolating switch)
- Avoids the need to call out meter operators to effect temporary isolations, avoiding wasted time for electricians and additional third party costs for consumers
- Significantly eases the regulatory burden on small electrical contracting businesses
- Reduces the likelihood of illegal abstraction by ensuring that all necessary seals can remain intact
- Overall size of meter unlikely to be increased
- No additional space required for a separate isolating switch between the meter and consumer unit
- Provides for unsealed access to the outgoing terminals of the meter, enabling electricians to tighten connections, replace meter tails etc without the need to call out the meter operator
- In new properties, provides for the distributor's service head and the meter to be installed and left energised awaiting connection of the electrical installation by the electrician
- No costs incurred in providing a separate isolating switch between the meter and consumer unit
- No initial or ongoing costs for electricians to be authorised to remove cut-out fuses

Disadvantages:

- Small increase in the smart meter unit cost
- Although single-pole isolation at the service head has been custom and practice in the electricity supply industry since 1937, double-pole isolation is preferable for TT systems.

Costs:

- Significantly less than the £1.8m to £9.3m per year range identified for Option B.

Option B – Incorporate an additional manually-operated single-pole or double-pole switch in the smart meter to provide for isolation

Benefits:

- All the benefits of Option A above
- Proven technology and method of working - electricity meters with integral single-pole switches and unsealed outgoing terminals have been in service for the past 20 years.

Disadvantages:

- Overall size of meter more likely to be greater than for Option A
- With regard to the alternative single-pole switch arrangement, although single-pole isolation at the service head has been custom and practice in the electricity supply industry since 1937, double-pole isolation is preferable for TT systems.

Costs:

- At an estimated additional cost £1 - £5 per meter, the total additional cost would be between £28m and £140m for benefits spread over at least 15 years, ie between £1.9m and £9.3m per year.

Option C – Install a separate double-pole isolating switch at the same time as the smart meter

Benefits:

- An existing engineering solution, but not the best, the most practical or the most cost-effective option
- Cut-out fuse secure and unaffected
- Avoids the need to call out meter operators to effect temporary isolations, avoiding wasted time for electricians and additional third party costs for consumers
- In new properties, potentially provides for the service head, meter and isolating switch to be installed and left energised awaiting connection of the electrical installation by the electrician
- Significantly eases the regulatory burden on small electrical contracting businesses
- Reduces the likelihood of illegal abstraction by ensuring that all necessary seals can remain intact
- Overall size of meter unaffected
- No initial or ongoing costs for electricians to be authorised to remove cut-out fuses.

Disadvantages:

- Significantly more costly than Options A or B
- Additional space required to mount the separate switch – may not be possible to accommodate in a significant number of installations
- Four additional site-made connections (potential weak points) required in meter tails than for the integrated switch approach (Options A and B)
- Would not provide full access to the consumer's equipment for maintenance, repair or replacement, i.e. to the isolating switch or the meter tails between the switch and the meter.

Costs:

- The cost of installing a separate isolating switch at the same time as a smart meter (space permitting) has been estimated at around £18 (£7.50 for the isolator, £1.50 for new meter tails, plus labour and profit). Total cost would be around £504m, or about £17m per year over 30 years (the notional service life of a double-pole switch).

Option D – Introduce a system for the authorisation of competent non-supply industry personnel to withdraw cut-out fuses

Benefits:

- More efficient use of electricians' time and resources than can be achieved using the service provided by meter operators
- Third party attendance costs would be reduced
- The common practice of electricians removing cut-out fuses would become legitimate and, with training, potentially controlled and safer
- Electricians would be able to confirm the suitability of the rating of the cut-out fuse for increased loading etc (which at present they are unable to do legitimately)

Disadvantages:

- A bureaucratic, costly, non-engineering solution that can be avoided if smart meters incorporate an isolating switch
- Individual competent persons would need to be trained, assessed and registered with a recognised personnel certification scheme
- Previous efforts to introduce such a scheme have been rejected by DCUSA
- Electricians would incur initial and ongoing costs for gaining and maintaining registration
- Would result in an increase in the regulatory burden and costs on electrical contracting businesses

- Registered persons would need to notify every intended withdrawal of a cut-out fuse in advance to avoid abortive investigation time/effort by distributors in response to false 'loss of supply' alarms from smart meters ('last gasp')
- Distributors would need to put a system in place to accept notifications of intended cut-out fuse withdrawals
- The meter operator would still need to be called out if there was a need to replace the meter tails or to check the tightness of the connections at the outgoing, sealed terminals of the meter
- Additional costs would be incurred for the purchase and control of sealing pliers
- Wider circulation of sealing pliers would increase the opportunity for misuse leading to potential for increased revenue protection issues

Costs (based on an EN 17024 personnel certification scheme):

- Initial training and off-site assessment of each individual as a pre-cursor to registration and authorisation – one day course £180 including VAT (assuming individual is a competent electrician). Total cost* over say first 5 years = £5.4m
- Initial training and assessment of new electricians joining the scheme, based on a 5% churn, ie 1,500 per year over 14 years = £3.8m
- Annual site surveillance visits to confirm individual is following safe and appropriate isolation practices and procedures (including re-sealing cut-outs etc) - £350 per person including VAT. Total cost* over 15 years = £157m
- Re-assessment of competence every 5 years for continued registration – half-day off-site refresher training and assessment - £90 plus £40 re-certification fee including VAT. Total cost* over next 10 years = £7.8m
- Fee for annual registration with scheme operator(s) - £50 per person including VAT for scheme administration. Total cost* over remaining 14 years = £21m
- Operation by distributors of a reporting scheme for intended fuse withdrawals – £1.50 per electronic notification to distributors (400,000 per year). Total cost over 15 years = £9m
- Total cost over a nominal 15 year period £204m = £13.6m per year.

* Assumption: At least one person from 75% of the Part P registered firms in England and Wales will register for practical and business reasons over the first 5 years (when unauthorised cut-out fuse removals will no longer go unnoticed) - 37,000 x 0.75 = 28,000 approx. Say 30,000 including electricians in Scotland.

Option E – Continue to rely on the service provided electricity suppliers/meter operators

Benefits:

- None likely to be perceived by electricians or householders

Disadvantages:

- Perceived as bureaucratic, inefficient and impractical, and therefore largely avoided by electricians
- Often difficult to identify and contact the relevant electricity supplier
- Provides no reduction of the regulatory burden on small electrical contracting businesses
- Would encourage the practice of 'working live' (Option 4) to avoid triggering 'last gasp' alarm in smart meters
- Meter operator resources would need to be increased significantly if smart meter alarms result in electricians having to use the service on every occasion, resulting in increased direct and indirect costs to consumers, and probably extending the time needed to complete each job. This is particularly likely when meter operator resources are heavily loaded during the roll-out phase.

Costs:

- At a typical call-out cost of £35 - £45 per de-energisation, between £14m and £18m per year over a nominal 15 year period
- Plus distributors' costs for the repair of service heads damaged during the unauthorised removal of cut-out fuses

Cost summary:

Option	Description	Total cost	Cost per year
A	Modify the design of the currently-specified 'remote disablement switch'	Significantly less than £28m to £140m over 15 years	Significantly less than £1.9m to £9.3m
B	Incorporate an additional manually-operated single-pole or double-pole switch in the smart meter	£28m to £140m over 15 years	£1.9m to £9.3m
C	Install a separate double-pole isolating switch at the same time as the smart meter	£504m over 30 years (the nominal service life of an isolating switch)	£17m
D	Introduce new system for the authorisation of non-supply industry personnel to withdraw cut-out fuses	£204m over a nominal 15 year period	£13.6m
E	Continue to rely on the service provided by electricity suppliers/meter operators	£210m to £270m over a nominal 15 year period	£14m to £18m

Conclusions

- The Smart Metering delivery programme provides an ideal opportunity to resolve this longstanding issue
- There is a clear cost/benefit case for selecting Option A or Option B
- Selecting Option A or B creates little or no impact on the physical smart meter installation process
- Changes made to the base meter specification before the point of equipment selection minimises equipment cost impacts
- Options A, B or C are based on engineering solutions that are far simpler and immediate than the ongoing schemes required for Options C and D
- Options A, B or C would greatly improve a situation which currently is at best confused and at worst hazardous
- The provision of a locally-actuated means of isolation provides for improved local security and the opportunity to adopt safer working practices
- The incorporation of a 'last gasp' alarm in smart electricity meters means that the current situation, which relies on a large proportion of temporary de-energisations being unauthorised, cannot continue indefinitely
- If the Government and the electricity supply industry are unable to address the issue at this opportunity, the result will be a continuing legacy issue at the service head for decades to come.

Industry support

- Representatives of the electrical installation industry (ENA, ECA, ELECSA, NAPIT, NICEIC and SELECT) strongly recommend Option A or Option B
- The Electrical Safety Council also strongly recommends Option A or Option B
- It is understood that representatives of AMO also strongly support Option A or Option B.