



V1.0

12/10/2011

Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Smart Metering Implementation Programme – Roll-Out Team,
Department of Energy & Climate Change,
3 Whitehall Place,
London, SW1A 2AW

12th October 2011

Sent via email to smartmetering@decc.gsi.gov.uk

Subject: 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).

Consultation Ref. URN 11D/836: SECURE METERS' Response.

Dear Sirs,

We are grateful for the opportunity to respond to this important consultation. Please now find our detailed response in the following pages and some key points that we would note here:

- a) We believe that the Programme needs to ensure due consideration to the smart metering solutions for 5 million electricity-only homes that do not have gas metering. Our responses contain a number of comments on this (Q.24, Q.34, and Q.35).
- b) There is now an urgent need to select a suitable HAN method and standard for the utility-robust SM HAN, for this is a core part of the design of the smart metering equipment. It is also a critical aspect for decisions on the overall data security arrangements and hub specification.
- c) If it is decided that a communications hub is to be part of the smart metering equipment then detailed specifications for it are now urgently required. The specification should allow for alternative physical implementations, including integrated, intimate, and separate hubs.
- d) In our view a Code of Practice document on Design, Implementation and Maintenance of Smart Metering Installations in GB also needs to be drawn up (Q.24).
- e) We think that a sanguine view of still-emerging “smart grid” requirements is required if any over-specification of the smart metering equipment and its testing is to be minimised.
- f) There are still issues to be resolved with micro-generation and connections for prepayment metering. Connecting micro-generation ahead of the billing meter could resolve these issues (e.g. as in France). An enduring solution is needed alongside the smart metering roll-out.

For any questions on our response please contact me



V1.0

12/10/2011

Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters' Response to the DECC Smart Metering Consultation Ref. URN 11D/836

Secure Meters (UK) Ltd (formerly PRI Ltd) welcomes the DECC consultation on draft licence conditions and technical specifications for the roll-out of gas and electricity smart metering equipment.

Secure Meters Group is an international supplier of Smart Metering solutions that has been actively involved in the UK market since the mid-1980s, pioneering a number of intelligent metering solutions along the way. Secure has extensive experience of prepayment metering and systems with very successful deployments and operations for Northern Ireland Electricity in the UK. Today Secure generates over 1.4 million encrypted transactions per month on-line. We believe that Secure has valuable expertise to bring into the work being undertaken by DECC, particularly on prepayment as this is a ubiquitous requirement for rollout.

Secure is leading the deployment of Smart Metering projects in the mandated rollout in Victoria, Australia, which is generally regarded as the most function-rich deployment of smart metering around the world. These projects involve WAN, outage detection, provision of DNO data from each metering point, remote download of firmware, and adoption of HAN for in-home displays. From the aspect of production capacity on metering equipment Secure does not have a constraint for the rollout volumes as it operates 5 accredited production facilities, including at our European logistics centre at Bristol. In addition to the Smart Metering Programme, Secure is heavily engaged in Smart Homes and customer engagement to achieve energy awareness, leading to more efficient use of energy and reductions of costs and CO₂. Our group company Horstmann Controls is leading the debate and delivery of solutions in the UK.

We would welcome the opportunity to provide our expertise to DECC as an equipment manufacturer and service provider (of meters, in home displays, WAN/HAN gateways, payment encryption services, heating controls and smart homes products).

Our responses are given after each question in the following pages. We have responded to Q.11, Q.13 and Q.14 on the draft licence conditions and to all the questions (Q.24 to Q.62) on the draft technical specifications.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

4. **Do you agree that Smart Metering Equipment should be compliant with the SMETS extant at the time of installation and that it should continue to be compliant with that version of the SMETS through the operational life of the equipment? Please explain your reasoning.**

Secure Meters Response: We agree that the Smart Metering equipment should be compliant with the SMETS at the time of installation. SMETS compliance for the operational life of the meter is subject to the impact of any future change on the installed meter hardware. Some changes may be challenging for the hardware components; a prudent approach to balancing the features is required to achieve the objectives.

8. **What contribution do you think the interoperability licence condition as drafted could play in ensuing that suppliers work together to ensure Smart Metering Equipment is interoperable? Please explain your reasoning.**

Secure Meters Response: We support the interoperability licence condition, clarity on this crucial aspect of Smart Metering. Clear interoperable standard will enable device manufacturers like us in planning the development program and ensure we can support aggressive time lines.

10. **What role could a dispute resolution mechanism have a role in ensuring interoperability? What key features should such a mechanism have?**

Secure Meters Response: We believe that the interoperability of Smart Metering equipment shall be governed by a strong certification regime. The certification shall involve end to end interoperability testing. The certification process iron out most of the interoperability problems, in case of a dispute the certification agency will play an important role in resolution of the disputes.

11. **For the smaller non-domestic sector do you agree that where there is a Current Transformer meter then suppliers should be required to install advanced rather than Smart Metering Equipment? Please explain your reasoning.**

Secure Meters Response: We do not believe that there is a valid business case for using smart metering rather than advanced metering for CT-operated non-domestic sites. The prepayment/PAYG and remote disconnect functions would not be straightforward to implement and support at CT-operated sites.

13. **Do you think under the new and replacement obligation gas suppliers should be given the option to wait for the installation of electricity Smart Metering Equipment before installing the gas Smart Metering Equipment?**



V1.0

12/10/2011

Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Please explain your reasoning.

Secure Meters Response: Please see our responses to Q.34 and Q.35.

14. **Do you think there are any other barriers to gas Smart Metering Equipment being installed before electricity Smart Metering Equipment? Please explain your reasoning.**

Secure Meters Response: Please see our responses to Q.33 and Q.35.

...

24. **Do you think that there are other requirements that the Government should adopt in the SMETS? Please explain your reasoning.**

Secure Meters Response: The establishment of a minimum compliance testing and certification regime for SMETS equipment will be essential for interoperability, including security functions and end-to-end testing.

Electricity-only premises and communications hub configurations need to be added as separate cases, including for the electricity meter variants in 1.38 to 1.41 of the IDTS document. There are some 5 million electricity-only premises in GB and different considerations apply as compared to dual-fuel and gas-first premises. See also our response to Q.34 and Q.35.

However, an important requirement still to be addressed is the need to draw up a Code of Practice document on Design, Implementation and Maintenance of Smart Metering Installations in GB, covering the issues of electrical safety, network characteristics, circuit ratings and protection, cable types and sizes and connections, tamper-resistant electrical connections to the communications hub, and any load switching for electricity-only premises using the meter variants. This is not covered by the individual equipment specifications but it is important and significant for multi-part and multi-utility installations, especially those using separate communications hubs that need a continuous electricity supply.

This CoP should also include the responsibilities of each party that could be involved in the implementation of any of the various arrangements that can occur in smart metering installations, including gas-first installations and any microgeneration connections and metering. Guidance on overall checks of installed and configured functionality for the smart metering system should be included, as indicated in clause 109 of the consultation. This may involve the temporary inclusion of a service tool onto the SMHAN. Arrangements for any changing of batteries on site, for physical sealing of equipment and any other security and anti-tamper practices also need to be coordinated and agreed. This



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

could include any arrangements for the use of sealed switches by electrical installers – see response to Q.46. Finally, guidance on the incorporation of any consumer devices onto the SMHAN (e.g. in a secure manner via a Bridge device) is recommended to avoid misunderstandings. Most of these aspects are GB-specific rather than European-wide owing to the SMETS itself and the various UK regulations, standards and practices that have evolved historically, or follow from the unique way in which competition in metering services has been achieved in GB.

25. **Do you agree that all the requirements recommended in the IDTS should be adopted by the Government in the SMETS? Please explain your reasoning.**

Secure Meters Response: While we agree with nearly all the requirements in the IDTS as being relevant to SMETS we have concerns over the following requirements: IM.3 (see Q.34), OP.3 (see Q.31/32/33), DS.8 (not for the meters), IN.3 (only via Bridge), ES.10 (gold-plated and not allowed for in the IA; suggest review again), GS.4 (resolution? – use 30-minute data; suggest review again). Also it is clear to us that the indicative events table in DI.1.10 and Appendix D of the IDTS needs to be reviewed and simplified, for there does not appear to be a detailed assessment of what the nature and costs of the DNO systems and processes involved in using them would be – see response to Q.43 for example.

26. **Do you agree that the security requirements recommended in the IDTS are proportionate to the level of risk that the End-to-end Smart Metering System faces? Please explain your reasoning.**

Secure Meters Response: We understand that the level of risk is part of the work in STEG, so STEG is the appropriate body to respond to this question, as an advisory body. We note that the IDTS does not address the security of the end-to-end smart metering system. We have responded to the other security questions at Q.58, Q.59, Q.60, Q.61 and Q.62.

27. **Do you agree that the process outlined above is a suitable way forward to develop the SMETS? Please explain your reasoning.**

Secure Meters Response: We agree with the process itself, as long as the SMETS addresses the certification testing details needed for interoperability. However the result is also likely to be influenced by the eventual outcome of the DCC procurement process. Also in our view the SME for electricity-only premises needs to be considered as a separate case in the relevant parts of the SMETS – see response to Q.24 and Q.34. We note that commercial availability of SME for the Foundation stage will be dependent upon EC approval of the final SMETS documents.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

28. **Do you think that the SMETS should ultimately be governed as part of the Smart Energy Code? What alternative arrangements could be adopted for the ongoing governance of the SMETS? Please explain your reasoning.**

Secure Meters Response: Yes, in so far as the Smart Energy Code is foreseen, as at the end of the Hothouse phase. We expect it will include a governance model for testing and certification assurance and security. Also the process for updating SMETS (and associated security and testing specifications) should be flexible and agile and not a barrier to innovation. The ongoing difficulties of approval for changes to the DTN unless the big 6 suppliers agree is an example of the sort of thing that needs to be resolved. The SEC also needs to ensure congruence between the DCC requirements and specifications and the SMETS itself. The CoP that we have described in response to Q.24 above will also need this type of governance.

29. **What unit manufacturing cost reduction do you think can be achieved for Smart Metering Equipment over the next 20 years? Please explain your reasoning. Please also provide any other comments (accompanied by evidence) on the estimated costs of the Smart Metering Equipment as set out in the Impact Assessment.**

Secure Meters Response: The SME costs used for the IA already reflect forward-looking high volume production and only small further cost reductions should be expected over the next 20 years. We have responded as part of BEAMA SMA to this in the earlier stages and still concur with that view. We note that cost increases are expected for some aspects, such as raw materials, special plastics, and metals. Economic forecasts for electronic component prices over this length of time are uncertain – for some components chip vendor capacity for the type of fabrication involved can lead to cost decreases or increases from time to time. The evolution of new component technology over 10 or 20 years can lead to more functionality and performance at the same or similar cost, rather than much lower costs – for example with PC Tower units. The types, ratings and quality of components used in long-life smart metering equipment are more conservative than those in many mass/disposable consumer products, so the latter are not necessarily relevant examples. Finally the IA costs are in pounds sterling while world pricing for components is based in US dollars, so the exchange rate could have a significant effect one way or the other over 20 years and a view needs to be taken on this.

30. **Do you agree that the Government should include a requirement for a Communications Hub in the SMETS? Please explain your reasoning.**

Secure Meters Response: In principle Yes, in order to facilitate interoperability and vending technology, gas-first installation options, and HAN operation. However where the hub is a separate hub (options 3a or 4) then consideration should also be given to the costs of any real-time clock and battery back-up in the



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

hub to permit timekeeping functions in the gas meter to be maintained. This clock should be to the same or better specification as the real-time clock in the electricity meter. In this case additional costs for the hub could arise in Table 4, and further additional costs will arise where a separate hub for polyphase sites is required, or where outage detection is also required (see responses to Q.31 and Q.35 below).

31. **Do you agree with the estimated costs and benefits for outage detection and the Government proposal to require the Communications Hub to include the equipment necessary to provide electricity outage detection? Please explain your reasoning.**

Secure Meters Response: No, we do not agree with the hub costs. If the outage detection and messaging function is to be included in the single-phase hub the additional cost of £1 in Table 4 is not sustainable in our experience – we estimate it is £3 to £4 varying with the WAN communications chosen and the network topology. For separate hubs on polyphase sites the costs of the power supply will be higher than the £2 in Table 4, and higher again if the outage detection and messaging function is to be included (see response to Q.35 below and Q.29 above).

On overall costs we note that the additional costs involved in the DNOs adapting to new systems and processes to handle the network power outages reported from smart metering sites also need to be included in the overall cost-benefit assessment, as compared to business as usual – see response to Q.33.

A decision on adoption of the outage detection and messaging function in the various types of hubs needs to be reviewed, taking into account the points in our responses to Q.31, Q.32, Q.33, and Q.35.

32. **Do you agree that the DCC Communication Service Providers should specify the requirements for outage detection as part of their general role in specifying the WAN technology? Please explain your reasoning.**

Secure Meters Response: We suggest that the Programme should specify the requirements, not leave it to the DCC service providers – it needs one rule, not three, to ensure uniformity and interoperability. If this is all left to the possibly 3 DCC Communication Service Providers to specify it will not be a clear requirement in time for the foundation phase. The detailed requirements for the hubs need to be clear in time for the Foundation phase to ensure a smooth transition from Foundation to Roll-out. Also if 3 different DCC implementations are chosen there is a potential for extra costs to be involved. This outage detection and messaging function would need to be addressed as part of the SME on site as well as in the overall end-to-end context (including DNO systems and users) – see response to Q.33. We would also note that this function is somewhat hardware dependent and it may not be possible to modify it sufficiently by subsequent firmware download, bringing in a risk of more site visits being required if the specification is left to the



V1.0

12/10/2011

Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

DCC service providers.

33. **Do you think that the Communications Hub should also have the functionality to send a communication to the DCC when power is restored? Please explain your reasoning.**

Secure Meters Response: Yes, an efficient outage management system would require both messages. This is a new requirement that in our view should be included in the overall impact assessment for outage detection monitoring if this is to be part of the Programme. With this function it would be straightforward to maintain lists or maps of current outages, their current outage duration, their successful restoration, and outage statistics, so that the management of outages and customers' experiences can be improved. However this will involve additional data amounts sent for each meter outage event, and the costs of the DNOs in adopting the new systems and processes needed. A robust approach to handling avalanche situations when a single power outage affects large numbers of premises in a town or city is then also an essential DCC and DNO capability.

We note that with a separate hub it may be that the hub sees no power while the electricity meter is still powered, so the hub needs to be able to differentiate this too – requiring a signal from the electricity meter. This may not be easy to implement for gas-first installations, in which case it may not be possible to differentiate a hub supply failure (requiring a gas meter operator visit) from an overall power outage (requiring a DNO call-out).

We also note that where a separate hub is used initially for gas-first installations then the question arises as to whether the power outage/restore messages should be sent to the DCC and DNO from when the initial installation is commissioned, or only from later once the electricity meter has also been installed by the electricity supplier under any agreements or licence conditions relating to the electricity supplier and DNO and the electricity consumer?

34. **Do you agree with the Government's proposal that fully integrated electricity meters and Communications Hubs will not comply with the SMETS? Please explain your reasoning.**

Secure Meters Response: No, this is not generally true at all. The same hub module could be mounted on the electricity meter (for instance option 3b, e.g. for electricity-only installations) or on a separate plinth (option 3a) e.g. for gas-first installations. Also, over time with more certainty and standardisation, suppliers may be able to procure fully integrated meters based on a more beneficial cost model, and some suppliers may not wish to pursue the gas-first option raised in Q.13. Apart from this, fully integrated meters could comply with SMETS for all the 5 million or so electricity-only sites – the arguments in clause 116 do not apply to



V1.0

12/10/2011

Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

electricity-only premises, including those electricity meter variants in the IDTS at clauses 1.38 to 1.41.

Furthermore, using a WAN/HAN hub module either on the electricity meter or on a separate plinth gives more flexibility for addressing the 5 million electricity-only premises and many dual-fuel electricity-first or gas-first premises in a cost-effective way. The use of a “hybrid option” involving both option 3a (hub on plinth) and option 3b (hub on electricity meter or meter variant) has not been directly addressed in the IA but is more cost-effective in meeting the objectives of the Programme. We note that the additional costs of the separate hub (3a) compared to the intimate hub on the electricity meter (3b) are taken as £5.60 from Table 6 in the IA.

The cost savings from this “hybrid option” compared to the preferred option 3a are shown by the following example. There are 5 million premises that are electricity-only for smart metering, where option 3b (intimate communications hub) is more cost-effective and the assumptions and rationale given in clause 116 are not relevant. There are also 18 million dual-fuel single-supplier premises where some suppliers may well prefer to use the possible option raised in Q.13 and Q.35b (electricity-first install) more cost-effectively with option 3b rather than the separate hub in option 3a. Assuming that suppliers would chose to install 50% of these dual-fuel sites with option 3b rather than option 3a on cost grounds, then the cost savings compared to use of option 3a throughout would be:

$$(5 \text{ M} + 0.5 \times 18 \text{ M}) \times £5.60 = £78.4 \text{ M}.$$

There are also other dual-fuel premises having separate electricity and gas suppliers where option 3b would be needed if some of these were installed on an electricity-first basis rather than on a gas-first basis. This could give additional savings of:

$$0.5 \times 4 \text{ M} \times £5.60 = £11.2 \text{ M}.$$

The overall cost reductions from this “hybrid option” would then be £90 M for domestic premises. There would be another £10 M cost reduction if this hybrid approach were also applied to small business premises, giving an overall cost reduction of £100 M towards meeting the objectives of the Programme for cost-effectiveness.

We note that there are also several practical and safety issues to be overcome with gas-first installs, as indicated in our response to Q.35. There are also further issues arising with gas-first installations and option 3a if the power outage/restore messages are also included in the separate hub, as indicated in our response to Q.33.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

35. Do you think the Smart Metering Implementation Programme objectives would be better met by:
- a. Using the SMETS to mandate a separate Communications Hub with a fixed WAN transceiver? Or
 - b. Giving suppliers flexibility over options for configuration of the Communications Hub33?

Please explain your reasoning.

Secure Meters Response: The first objective of the Programme given in the Impact Assessment is to achieve the smart metering roll-out in a cost-effective way. We note that the alternative arrangements considered for the hub function only affect some of the costs arising, but not the benefits.

- (a) The SMIP objectives would not always be met by a separate hub as at (a), for where the separate hub is connected ahead of the existing single-phase meter in a gas-first installation then significant issues arise over safety, protection, and tamper-resistance, leading to extra costs for Option 3a. Also in our view the SMIP objectives would not be met for the 5 million electricity-only premises if they had to use a separate hub (option 3a). We note that the arguments in clause 116 do not apply to electricity-only premises, including those electricity meter variants in the IDTS at clauses 1.38 to 1.41. See our response to Q.34 on cost-effectiveness and the "hybrid option".

Also for polyphase whole-current sites a separate communications hub type would need a 4-wire voltage connection and power supply and would need to monitor voltage status on all 3 phases if outage detection and messaging is required, as raised in Q.31. This would not be the case for Option 1 or 2 or 3b, where voltage monitoring and the (dc) power supply for the hub can come from the (polyphase) electricity meter. We note that clauses 121 to 124 in the consultation document and the relevant pages in the IA do not address all the implications associated with the power supply requirements needed for each hub option.

- (b) would better meet the objectives for cost-effective roll-out and give suppliers more flexibility with equipment configurations, in our view, including for electricity-first and electricity-only premises using Option 3b. It is expected that over time suppliers' choices will migrate towards the most suitable solutions. Our response to Q.34 covers this in more detail.

36. Do you agree there should be no restrictions on the HAN standards adopted by suppliers, provided they are available as a European (CEN, CENELEC or ETSI) or International (IEC or ISO) standard? Please provide evidence to support your position.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: Yes, a HAN standard for the SME is essential. It should be open for all and interoperable. It could come from an ESO/ISO or from an European trade body. If there are no restrictions on HAN standards then it is not clear who is to be responsible for HAN security in the Foundation stage. This will slow down Foundation stage engagement since suppliers (procuring HANs) and vendors will not get full end-to-end security arrangements in place in time. The absence of a single standard will also threaten the migration from Foundation to Roll-out operations using DCC – see response to Q.61. If there is to be no overall government review and conclusions on this for 12 to 18 months then how would the formation of contracts for the Foundation phase be resolved?

37. **The IDTS has recommended that all standards should be recognised or be in the process of being recognised by 31 December 2014; do you agree with this recommendation? Please explain your reasoning.**

Secure Meters Response: We agree that an agreed date for availability of the standards is necessary. We have noted that the date of 31 December 2014 is not now consistent with the date currently envisaged for commencement of mass Roll-out (in Q2 of 2014 in clause 21). Coordination is needed in SMETS – the date should be 3 or 4 months ahead of the Roll-out, i.e. by December 2013. But this still begs the question of interoperability (or lack of it) and end-to-end security during the Foundation stage.

38. **Do you think that regulatory obligations are needed to underpin a systematic approach to testing of HAN standards during the Foundation phase? Please explain your reasoning.**

Secure Meters Response: Since this amounts to field testing to confirm RF performance in various types and sizes of property then regulatory obligations could mainly be required to share test and field results openly, unless testing is carried out separately by the Programme. See also response to Q.35(b) above on hub options, and Q.55 to Q.57.

This is a critical issue for the Programme and the criteria for judging success will be important. The equipments used for HAN field testing and logging need not be smart meters and hubs and need not affect existing billing meters; they need not comply with the IDTS. A 3-month logging period would be the minimum needed. The physical layer of HAN testing and performance should be assessed separately from application layer testing.

We have noted that clauses 140 and 142 are not strictly valid – consumers would not be able to purchase equipment for them to include directly in the secure SMHAN themselves. They would need to arrange for a bridge device to be provided and installed, with their desired HAN type on the consumer side – see response to Q.46 too.

See also response to Q.35(b) above on hub options.



Secure Meters (UK) LTD
Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

39. **Do you agree with industry's recommendation that DLMS should be adopted as the application layer for communications with the DCC? Do you believe there are any consumer, economic or technical issues with this solution which could be circumvented by an alternative approach? Do you have any economic, technical or consumer evidence to assist Government in evaluating industry's proposal?**

Secure Meters Response: A number of manufacturers (including Secure Meters) have DLMS/COSEM-based products for WAN communications. In our view there should be a detailed assessment of the impact of the candidate application layers on communications services costs over the 20-year lifetime. The overall assessment could also depend on whether "original" raw data (e.g. in DLMS/COSEM/OBIS form) is to be stored, or whether this is reduced to another file form for the database.

40. **Do you agree with industry's recommendation that DLMS and Zigbee SEP 1.x should be adopted as the application layer for communications within the consumer premises, provided they install the necessary translation equipment? Do you believe there are any consumer, economic or technical issues with this solution which could be resolved by an alternative approach? Do you have any economic, technical or consumer evidence to assist Government in evaluating industry's proposal?**

Secure Meters Response: In principle we agree that DLMS/COSEM and ZigBee SEP 1.x could be adopted for this. ZigBee 1.x is mature and is deployed widely for smart metering, including in the UK. DLMS/COSEM is also in wide use and is being extended to include prepayment and tariffs for the UK. There are benefits from use of a common protocol over the WAN and HAN that should also be considered. Translation in the hub should be avoided, it must be done in the DCC if needed, to enable future innovation. See response to Q.49.

41. **Do you think the Smart Metering Implementation Programme objectives would be best met by the proposed approach above? Or should a single, network-layer technology standard such as IPv6 be mandated? Please explain your reasoning.**

Secure Meters Response: In our view the SMIP objectives can be met without the government having to define this. Network-layer addressing for the WAN will be heavily dependent on the WAN technology used. The addressing should preferably involve the Device IDs, including for the hubs and end devices. In our view the potential Communications Service Providers should specify the network-layer standard that they propose using for the WAN, in the context of the overall requirements, including the data security requirements. In the Foundation phase the addressing mechanisms of the WAN/HAN should be sufficient.

**Secure Meters (UK) LTD****Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND**

42. **Is the provision of a single network-layer address for each Communications Hub a reasonable and sufficient functional requirement for the Smart Meter WAN? Will this requirement limit potential future capability or present challenges, for example, in multi-occupancy buildings?**

Secure Meters Response: In principle a single network-layer address for each hub appears sufficient, noting that some hubs/premises may have several unit sub-addresses for multiple meters per home or per building. Where a change of WAN type at premises is subsequently required a different network-layer address may also be involved. If network address translation is required it should form part of the detailed specification for the hub.

43. **Do you think that maximum and minimum demand functionality should be included in the SMETS? Please provide supporting evidence for your response**

Secure Meters Response: There appears to have been no cost-benefit analysis for the usage associated with this potential DNO requirement, which from the definitions in the IDTS would be for 30-minute kW max/min values, although the time interval for max/min reset is not easily defined. There is also a host of similar requirements and thresholds in the indicative events table in Appendix D of the IDTS but no consistency in how they might all be used or what the nature and costs of the DNO systems and processes involved in using them would be. There is also a large amount of 30-minute average demand data available from the smart meters anyway. Too much data and event monitoring and processing functionality in the meters should be avoided in the interests of achieving clear testable interoperable specifications based on relevant European and International Standards for residential metering. From our own studies we believe that the local distribution networks can be modelled effectively using on-line or off-line 30-minute demand data from metering equipment at local distribution transformers, plus gross generation data from any microgeneration sites, and so this should be part of a separate smart grid programme in due course once requirements, usage, and overall cost-benefits have been fully established.

44. **Do you think that network registers should be included in the SMETS? Please provide supporting evidence for your response (including the cost implications for Smart Metering Equipment, and any alternative approaches that would provide this functionality).**



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: We wonder whether the delivery of varying DUoS charges as indicated in clause 159 could eventually lead to more confusion and complication for customers in comparing prices and charges, just the opposite of what OFGEM and Consumer Focus want for consumers?

In any case these additional registers would need to be a separate instance of register objects and tariff rates/times with separate access rules and security considerations – how many different rate/time tables would be required? Also some provision for displaying these registers may also be required, if only to meet Standards and carry out type or routine testing. While the additional direct meter costs may be small there are significant extra costs and timescales involved in development and testing for compliance. Then any issues arising and changes subsequently required could involve a significant amount of further compliance testing and firmware download, raising the question of who would pay for these various additional aspects? A pragmatic view is clearly required, considering that the availability of 30-minute data from the meters will anyway allow statistical surveys of local network loading and compliance with regulatory requirements. The use of advanced metering equipment at local distribution transformers is also a modern way of looking at the per-phase loading of circuits – see response to Q.43.

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.**

Secure Meters Response: We note the floating neutral situation can involve dozens of premises lying downstream from the point at which the neutral conductor or sheath has been broken. These downstream premises may all be single-phase residential premises, but when the downstream network is a polyphase network then the floating neutral will take up a certain voltage at any time, depending upon the relative sizes of the loads remaining on each of the three phases. This is the basic situation that can sometimes arise from accidental damage to the cables or lines in the local network

The proposal to use a load switch (in the smart meter or otherwise) to protect the consumer's connected equipment by automatically opening the load switch when the supply voltage rises above a fixed threshold only deals with part of the situation, for when the loads in the various premises are removed this affects the resulting voltage on the floating neutral. In one phase the voltage to neutral could rise as a result, while the voltage in another phase consequently falls. If all loads in all phases switched out at the same time the neutral voltage and the phase to neutral voltages would all be around normal, but this situation is unlikely since the various premises will have been drawing differing loads. Also, if the smart meter switch is operated when its voltage rises then the same level may not occur in other premises (especially in those without a smart meter installed yet).



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

There is then the situation that the various phase to neutral voltages will be varying up and down. The load switches (whether in the meters or separate) will want to switch on again when the voltage that they see has reduced to around normal or below, but it is not clear that this will be a stable situation since some loads may still be connected – some kind of varying or oscillating process may result. This could result in a different situation for some premises than with no overvoltage protection – some may even be worse off? We trust that the Technical Study in clause 167 will also look into this, and the criteria for when the load switch should decide to switch back in, and when any alarm should be sent (to the DNO). Accordingly we feel that the primary issue here is not costs and benefits. We would also note that the proposal would not prevent damage to consumers' equipment arising from a nearby lightning strike.

On clause 168 and the European metering standards (EN 62055-31 and draft for IEC/EN 62052-31) the safety requirement is for the metering equipment itself to safely withstand such rises in voltage, but not to also protect downstream consumer equipment. Possible further withstand requirements are for the meter to then subsequently remain intact for further functional service when voltage returns to the normal range (without any intervention or manual reset required); and possibly also for the meter's accuracy to remain within overall limits after such an event.

Finally, if the smart meter's load switch were also to be used for this overvoltage protection situation then the owner/operator of the meter (or the supplier involved) would appear to be assuming some responsibility for protecting the consumer's equipment from some of the consequences of the accident involving the DNO's network. So far it has had to be assumed by all that mains voltages may exceptionally rise above statutory limits.

Based on the reasons as above we do not agree that the switch should be used for protection purpose.

46. **Do you agree with the proposed approach for consumers to access data and transfer it from the HAN via a separate "bridging" device? Please explain your reasoning.**

Secure Meters Response: Yes we agree with the proposed approach, but only if a secure method is available for an approved bridging device to be included onto the SMHAN without the need for a meter operator visit or HHU, i.e. it must be easy to include one bridging device at any time subsequent to the SME installation visit. It appears unlikely that an unconfigured bridging device bought on the open market could be added to the SMHAN securely in this way, so it could be necessary for the energy supplier to sell and send a specifically-configured device to the customer, either for self-inclusion or for an energy services company to



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

install it for the customer. The customer device may need to be limited to read-out only of specified electricity and gas meter data. If this approach is adopted then the customer may not be able to use the device in new premises when moving home. The proposal requires further industry work.

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.**

Secure Meters Response: We feel that there is a certain amount of confusion surrounding this issue. We would offer the following clarifications.

The ESQCR regulations do not allow the neutral to be broken along its passage through the metering equipment before its point of connection to the customer's circuits, so a full circuit isolation switch function cannot be built into the smart meter - see the last paragraph below too.

If a single-pole isolator function was added to the load switch in the SME then apart from the electrical design it would appear to need an external manual means of directly opening and closing it. For prepayment/PAYG or remote disable purposes it should not be possible to directly close the switch if it has been intended to be switched off electronically. On the other hand sometimes it should be possible to electronically restore the switch if it had been switched out (e.g. for overvoltage). But then if an "open" manual means of tripping the switch out and restoring it is provided for electrical installers other issues arise – e.g. nuisance tripping out of the switch by small boys where outdoor meter cabinets are in use. So the manual switch will need to be under a separate sealable cover, under arrangements included in the CoP covered in the response to Q.24. Once the switch has been manually put into the "isolate" condition it must not be possible close it by any electronic means, such as remote instructions from the centre. Thus there are some conflicting requirements to be resolved if this type of function were to be added to smart meters.

We also note that introducing an SME isolation switch in some way (e.g. options 1, 2, or 3) would not help with the issue of connecting a communications hub in a gas-first installation.

Finally, the situation appears to arise from the modern UK practice of including both the main isolation switch and all the circuit protection devices inside the consumer unit. Alternatively the customer's isolation switch could be mounted separately, near to the meter. In some areas the metering board has included a separate phase and neutral isolation switch at the point of connection to the customer's circuits, for use by electrical contractors when first connecting up the premises. This is often called a "connection switch" rather than an "isolation switch" and has been provided as part of the supply arrangements and charges for



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

connecting new premises.

Based on the reasons mentioned above we do not support the option to electrical contractors to provide protection function.

48. **Do you agree with industry's proposals for an overall architecture of an application layer standard with translation through a Communications Hub to a HAN? Do you believe there are any consumer, economic or technical issues**

Secure Meters Response: See response to Q.40, Q.41 and Q.49 for our views on translation through the hub.

49. **Where do you believe that translation is best managed:
a) At the Communications Hub; Or
b) At the DCC?**

Do you have any economic, technical or consumer evidence to assist Government in evaluating the options?

Secure Meters Response: Any translation must not be carried out in the hub, but in the DCC itself. For security reasons the messages should not be decoded in the hub and then recoded for transport to the end device. Instead end-to-end data transport and decoding/encoding is important. Also if translation was carried out in the hub then when changes are needed they would need to be coordinated for both the hub and the end device(s) - except for any gas mirror data. We note that the responses to Q.39 are also relevant here.

50. **Do you agree that the IHD should only be required to display ambient feedback based on energy usage? Please explain your answer.**

Secure Meters Response: Traffic lights just for energy usage (not cost) would appear to be sufficient from existing experience. But going forwards alternative approaches could be required as new types of tariff evolve.

51. **Do you agree that Smart Metering Equipment should be designed to support the calculation and/or display of account balances as described above, even though suppliers may not initially be mandated to invoke such functionality for credit customers?**



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: In our view the electricity and gas meters/mirrors should be designed to calculate the account balance, including for possible display on the IHD for credit customers. This is a similar process to that for prepayment/PAYG customers, instead requiring the energy supplier to update credits/payments such as direct debit payments down to the meters to support the account balance calculation in the meter or gas mirror. Detail on the last payments and dates should also be available for the IHD, so that both credit and prepayment customers can be offered equivalent levels of service.

52. **What do you think the costs and benefits are of mandating suppliers to display an account balance (over-and-above those arising from display of information on cumulative cost of consumption) for credit customers on their IHD?**

Secure Meters Response: The direct costs involved are very small for the IHD, and are mainly the extra testing costs for the meter/mirror. However the overall costs are likely to be very dependent on each supplier's systems and the technology and standards and testing involved – see Q.51 too.

53. **Do you agree with or have any comments on the Government's proposals for the outstanding issues from the Response? Please explain your reasoning.**

Secure Meters Response: We agree with the proposals in clauses 202 to 211 of the Consultation.

54. **Do you think that an assurance framework, underpinned by regulatory obligations, is needed to support the delivery of the required functionality, interconnectivity, interoperability, and security of Smart Metering Equipment? Please explain your reasoning.**

Secure Meters Response: Yes, in our view an assurance framework underpinned by regulatory obligations for the SME installations and data communications and processing for SME sites is required. The reasons follow from our responses to Q.55 to Q.57 below.

55. **Do you agree that as part of any assurance framework adopted, there should be a testing regime in place to support the delivery of the required functionality, interoperability and security? Please explain your reasoning**



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: In our view some kind of independent testing regime is essential, in both the Foundation and Enduring phases. There are expected to be a number of different types of SME units involved each from different manufacturers. Functionality, security, communications and interoperability testing and approval to the test specifications for each version of each unit is essential before introducing units into the field.

Some aspects of some units could be tested by independent test houses and the results submitted to the SME testing and approving body. The government should put in place a compliance testing model and notify independent test houses of the testing required for SMETS compliance. Where associations offer independent conformance testing services these results could also be submitted, e.g. communications protocol conformance from the DLMS User Association or ZigBee Association. In principle this will also be required for any SME firmware updates and upgrades prior to issue for download, whatever the reason for their development.

56. What are your views on the options outlined for a testing regime? Are there other options that should be considered?

Secure Meters Response: In our view a certification/accreditation scheme is the most appropriate approach, in both the Foundation and Enduring phases. An overall "SMIP Compliant" stamp would then be granted by the independent SME testing body, coordinating and assessing all the test results.

If it was necessary to submit the detailed testing requirements to the EC under the TSD then this might also apply to any subsequent amendments to the SMETS and associated test specifications. This updating and testing process would have to be flexible and agile, especially during the Foundation phase or if a significant security threat was to emerge.

Close cooperation and coordination between the SME certification body and the end-to-end testing regime is also likely to be required, particularly in respect of security and cryptography aspects.

57. Do you think that a different approach to assurance is necessary for the Foundation and enduring phases? Please explain your answer.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: While the governance arrangements may change from the Foundation to the Enduring phase the underlying approach to assurance should remain the same and should include installation-site-dependent performance and practices as well as the individual equipment units. This approach is also needed to ensure that the security aspects and operations follow through properly from one phase to the next – see also responses to Q.38 and Q.61.

58. **Do you think that the activities outlined above are a suitable way for achieving interoperability across Smart Metering Equipment cryptographic functionality? How else could this be achieved?**

Secure Meters Response: We believe that the activities outlined in section 3.5 on cryptographic functionality are an appropriate start to achieving interoperability across Smart Metering Equipment cryptographic functionality. Using cryptographic functions to ensure safety of the sensitive data and critical commands is desirable for smart metering systems. Our suggestion to assist the work done by the STEG is that the standards for the foundation phase and the roll out phase should be the same and predefined along with SMETS to ensure no security risk to the roll out of smart metering systems.

59. **Do you agree that cryptographic/ key management is necessary to secure the End-to-end Smart Metering System? Please explain your reasoning.**

Secure Meters Response: We agree to the government proposal that cryptographic key management is necessary to secure the end-to-end smart metering system.

The wireless communication channels on SMWAN and SMHAN of the smart metering system expose the system to various security attacks including man-in-middle attacks, spoofing etc. In the event that any of these devices are compromised there is a danger of the hacker 'gaining access through source routing' which compromises the DCC security.

As each of the premises in GB will have these devices, the devices are available to all kinds of attackers hence the probability of attack on the networks is increased manyfold.



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

60. **Do you agree with the Government's assessment of the advantages and disadvantages of the cryptographic solutions identified above? What other options should the Government consider? Please explain your reasoning.**

Secure Meters Response: We broadly agree to the government's assessment of the advantages and disadvantages of the cryptographic solutions is based on operational and running costs of the various crypto functions, based on the types of keys, and it is appropriate in the context. In our view the assessment is appropriate in the context of smart metering program.

We suggest including additional parameters in the assessment. The following may be considered:

- 1) Security policy of the data transfer from SMWAN to SMHAN environment.
- 2) Policy definition within the SMWAN.
- 3) Policy definition within the SMHAN.

61. **Do you think that it would be appropriate for the DCC to be responsible for cryptographic key management for the End-to-end Smart Metering System? What other options should the Government consider? Please explain your reasoning.**

Secure Meters Response: We support the government proposal of assigning to DCC the responsibility of managing the cryptographic keys for the end to end smart metering system for roll-out.

Another option to be considered is an independent authority outside the DCC function providing the service to all industry participants for cryptographic key management.

We suggest that the programme considers the foundation phase cryptographic key management and provides details on how the security in the foundation phase will be assured and what is the process of migration from the foundation phase to the roll-out phase.

62. **How do you believe the security approach should be applied to opted out non-domestic consumers? Do you see any issues with the approach? Please explain your reasoning.**



V1.0

12/10/2011

Secure Meters (UK) LTD

Secure House, Moorside Road, Winchester, Hampshire, SO23 7RX, ENGLAND

Secure Meters Response: We believe that the security mechanism for opted out non-domestic consumers should be similar to the security mechanism provided for the domestic consumers. This belief is based on the fact that the non-domestic consumers may opt for the DCC services, in which case the equipments shall be capable of supporting the DCC security schemes. Any other mechanism may potentially complicate DCC processes, increasing the cost to DCC for the case when these consumers opt for DCC services at a later date.

END