

BEAMA Submission to SG1 regarding Functional Requirements
21 September 2010

ID	Requirement	Change category	Suggested change wording	Justification (short description)
IM.1	The smart metering system components shall be installable in current existing meter locations in consumer premises.	substantive	Refer to SG3	There are possible issues regarding small Ferraris and electronic single phase meters and crowded meter boards but these issues must be met by existing meter exchange programmes. The footprint of a smart meter is considerably larger than these meters.
IM.2	The smart metering system shall enable remote firmware upgrades.	non-substantive	This must exclude legal metrology firmware.	
IM.3	The smart metering system shall support in situ exchange of WAN communication technology (without removal of meter).	substantive	The smart metering system shall support in situ exchange of WAN communication technology	It may be more economic to include the WAN module in the electricity meter and exchange the meter on-site and the WAN module off site
IM.4	The smart metering system shall resume normal operation without technician intervention after a failure in the metering system power supply.			
IM.5	The smart metering system components shall be uniquely identifiable electronically where applicable.			
IM.6	The smart metering system components shall be uniquely identifiable mechanically where applicable.			

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IM.7	The smart metering system components" batteries shall only be exchangeable by authorised personnel.	non-substantive	The smart metering system components" batteries shall only be exchangeable by authorised personnel, with the exception of the IHD.	Replacement of IHD batteries should not require a site visit
IM.8	The smart metering system components shall support local access and configurability by authorised personnel.			
IM.9	The smart metering system shall allow in situ maintenance for non safety critical maintenance.			
IM.10	The smart metering system shall support remote identification (by authorised parties) of devices attached to the HAN.			
IM.11	The smart metering system shall self configure on installation without the need for manual data entry to the system components.	substantive	This requirement depends on the quality of the customer data base. Can all manual data entry be avoided? There are problems with pre-programming meters prior to installation. Can meters be programed on site using automated tools? Refer to SG3?	
IM.12	The smart metering system shall be installed and maintained in a manner that protects public safety.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
OP.1	The smart metering system components necessary for remote reading in the consumer premise shall operate independently (normal operating conditions) of any consumer interaction (including provision of energy supply and communications).			
OP.2	The smart metering system shall use UTC for all timing functions/date & timestamps.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
OP.3	The smart meter shall support “last gasp” communications to notify loss of energy supply.	substantive	BEAMA is surprised that this requirement is included as a meter requirement. We would refer you to the work carried out by ENA with the assistance of Engage Consulting and ourselves (ENA High Level Smart Metering Cost Benefit Analysis Ref: ENA-CR009-004 - 1.1 July 2010) which indicates that this functionality is not justified on a cost benefit basis. BEAMA understands the concern relating to the provision and operation of “last gasp” communications on loss of supply. Care needs to be taken in providing such information to ensure it is “good” and reasonable in cost. BEAMA would welcome the opportunity to discuss the points further within the SMDG. It should be noted that this requirement has different implications for different technologies.	

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OP.4	The smart metering system components in the consumer premises shall consume less than 2.6W average combined.	substantive	May be difficult and may depend on the functionality offered in the IHD and the HAN communications technology.	<p>BEAMA understands the need to ensure that the burden on the network due to smart metering is kept to the minimum to ensure that it provision does not increase unduly, the carbon emissions from the metering equipment. The maximum burden for all components (meter, comms hub & IHD) is far lower than the requirements given in EN 50470-3:2006 for complex meters, which smart meters most definitely are.</p> <p>With a standard (low function display) and GPRS hub we are about 2.9W for gateway, IHD and Electricity meters. With a high end display (colour and touch screen, central heating controller etc, etc...) plus a meter (Australian, Smart type) the figure is close to 3.6W.</p>

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OP.5	The smart metering system time shall be accurate to within 20 seconds of UTC.	non-substantive	With no correction, the smart metering system time shall be accurate over a 20 day period to within 20 seconds of UTC. The time should be corrected so that it does not differ by more than +/- 20s of UTC	This needs to state the period for +/- 20s, which is 20 days from CoP10 There are two issues - the intrinsic accuracy of the time in the meter and the process around correcting the time.
OP.6	The smart metering system shall support a default mode of operation (reset to minimum functionality).			
OP.7	The smart metering system shall support firmware upgrades while maintaining normal metrology functionality.	substantive	There are major potential risks around this process, should we refer this to SG3 for investigation?	
OP.8	The smart metering system shall enable robust and reliable local (in consumer premise) user interaction to re-enable energy supply in the event of activation of the enablement mechanism.			
DS.1	The smart metering system shall display any billing information using £ and pence (but be Euro compatible).			
DS.2	The smart metering system shall be capable of storing 12 months of half hourly consumption data.	substantive	The implications of this are unclear without a clear definition of the data that is to be stored	
DS.3	The smart metering system shall support display of mode of operation (credit or Prepayment).			
DS.4	The smart metering system shall display energy supply status (enabled or disabled).			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
DS.5	The smart metering system shall display local time unambiguously (where it is displayed).			
DS.6	The smart metering system shall support erasure of any consumption data stored locally.			
DS.7	The smart metering system shall support the provision of information in a manner that takes account of the requirements of persons with disabilities.	non-substantive	We assume that a reference to 'system' implies the possibility of using the IHD.	
DS.8	The smart metering system shall support English and Welsh language for any human communication.			
DS.9	The smart metering system shall unambiguously identify all of its registers.			
IN.1	The smart metering system shall be capable of supporting two different suppliers (i.e. for gas and electricity) in the same premise as well as switching between any licensed suppliers.			
IN.2	The smart metering system shall allow for change of supplier remotely without premise visit.			
IN.3	The smart metering system shall support non proprietary data formats for information exchange with consumers	non-substantive	The metering system shall support standard data formats...	Double negatives confusing
PC.1	The smart metering system shall be remotely switchable between prepayment and credit mode of operation.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
PC.2	The smart metering system shall support "tokenless" prepayment mode of operation via remote top ups.			
PC.3	The smart metering system operating in prepayment mode shall support remote configuration of emergency/friendly credit.			
PC.4	The smart metering system operating in prepayment mode shall support remote configuration of debt recovery.			
PC.5	The smart metering system operating in prepayment mode shall be capable of maintaining supply to premise independent of WAN communications.			
PC.6	The smart meter operating in prepayment mode shall store top up, debt recovery, and emergency credit history for the last 3 months.	non-substantive	The smart meter operating in prepayment mode shall store top up, debt recovery, and emergency credit history for the last 5 payment transactions and 10 debts (for example) .	memory requirement is based on number of transactions, not the period. Need non-ambiguous requirement.
PC.7	The smart metering system shall store data used for billing and settlement purposes for at least 3 months in non volatile memory.	non-substantive		Suppliers may offer different contracts - how does the manufacturer know this in advance. Should there be a more specific requirement for how many data items should be stored?
PC.8	The smart metering system shall support real time remotely configurable tariff structures.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
PC.9	The electricity smart meter shall support at least 48 configurable time of use periods for its consumption registers.	non-substantive		Need for more specific requirement
PC.10	The smart metering system operating in prepayment mode shall support local credit top up.			
PC.11	The smart meter system shall support prompt and timely register of remote top ups.			
ES.1	The smart metering system shall support remote connect and disconnect of supply into the consumer premise.			
ES.2	The smart metering system shall support at least one total register for import kWh.			
ES.3	The smart metering system shall support at least one total register for export kWh.			
ES.4	The smart metering system shall support import kVarh measurement			
ES.5	The smart metering system shall support export kVarh measurement.			
ES.6	The smart metering system shall support import kW measurement.			
ES.7	The smart metering system shall support export kW measurement.			
ES.8	The smart metering system shall support import kVAr measurement.			
ES.9	The smart metering system shall support export kVAr measurement.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
ES.10	The smart metering system shall support measurement of other power quality data including: voltage, frequency and sag and swell information, harmonic distortion.	substantive	These requirements require more definition for their cost implications to be properly understood	As with OP.3 BEAMA is surprised that this requirement is included as a meter requirement. We would refer you to the work carried out by ENA with the assistance of Engage Consulting and ourselves (ENA High Level Smart Metering Cost Benefit Analysis Ref: ENA-CR009-004 -1.1 July 2010) which indicates that this functionality is not justified on a cost benefit basis. BEAMA understands the concern relating to the provision and operation of “last gasp” communications on loss of supply and the measuring and monitoring of “sags and swells”. Care needs to be taken in providing such information to ensure it is “good” and reasonable in cost. BEAMA would welcome the opportunity to discuss the points further within the SMDG.

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
ES.11	The smart metering system shall support capture of consumption and demand data at 5 second intervals.	non-substantive	The smart metering system shall support capture of consumption and demand data at 5 second intervals or at 30 minute intervals if there has been no change in consumption.	Consumption data to be reported to the HAN with a maximum delay of 5 seconds. In the event that there is no consumption (and therefore no data to send) then data will be sent every 30 minutes.
ES.12	The smart metering system shall allow the supply switch to be configurable to be open or closed for a range of non safety critical events.			
ES.13	The smart metering system shall support auxiliary switching and load control commands from remote third parties.			
GS.1	The smart metering system shall support local storage of calibration data (calorific value, conversion factors, etc.).			
GS.2	The smart metering system shall support at least one total register for gas consumption.			
GS.3	The smart metering system shall support at least 48 wake up events per 24 hour period.			
GS.4	The smart metering system shall support capture of gas consumption data at 5 second intervals.	non-substantive	Consumption data to be reported to the HAN with a maximum delay of 5 seconds. In the event that there is no consumption (and therefore no data to send) then data will be sent every 30 minutes.	

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
GS.5	The smart metering system shall support a valve for enablement and disablement of gas supply.			
GS.6	The smart metering system shall continue normal operation in the event of a gas supply interruption.			
GS.7	The smart metering system valve shall be configurable to b			
GS.8	The smart metering system shall support 20 valve operations per year within the 15 year battery life requirement.	non-substantive	For reliability and operational reasons battery replacements will have to begin earlier than the design life.	
GS.9	The smart metering system shall support measurement of peak demand for gas supply.	non-substantive	Needs more definition to understand implication	
DI.1	The smart metering system shall support logging of the following diagnostic, fault and tamper information, including date stamping of the information: meter faults, supply faults, communications faults, cover removal, clock resets and faults, improper running of the registers, unauthorised logical access, energy flow exceeding agreed extreme levels, interruption to neutral supply of meter (electricity only), bridging of internal switches (electricity only), remote enablement, disablement events, etc.	substantive	Suggest a fault analysis is carried out in SG3 that would separate faults from tampers. There should be a similar tamper analysis.	

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
DI.2	The smart metering system shall support remote configuration of logs, alarms and thresholds.			
DI.3	The smart metering system shall support configuration of alarms associated with usage thresholds.			
DI.4	The smart metering system shall store its configuration data in non volatile memory.			
DI.5	The smart metering system components shall be identifiable within any diagnostic log information.			
DI.6	The smart meter system shall communicate battery status for metrology related functionality.			
SP.1	The smart metering system shall support strong mechanisms for authentication, authorisation and access control.	non-substantive	This cannot be delivered independently of the WAN infrastructure	
SP.2	The smart metering system shall support secure data communication to ensure the confidentiality, integrity and availability of the data and commands.	non-substantive	This cannot be delivered independently of the WAN infrastructure	
SP.3	The smart metering system shall be protected from physical tampering or interference, e.g. security seals, tamper switches, etc.			
SP.4	The smart metering system components shall be inaccessible to unauthorised parties.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
SP.5	The smart metering system shall ensure that keys and certificates used for access control and secure communications are securely stored.			
SP.6	The smart metering system encryption keys and certificates shall be remotely manageable in a secure manner.			
SP.7	The smart metering system shall be appropriately robust to prevent local or remote electronic attack or unauthorised use.			
SP.8	The smart metering system shall ensure that firmware upgrade is secure.			
SP.9	The communication interfaces of the smart meter shall be secure and robust.			
SP.10	The security smart metering system shall be demonstrated to be fit for purpose through rigorous independent testing.			
SP.11	The smart metering system functionality that can affect the supply of energy (e.g. remote disconnect or demand side management) shall be appropriately protected from unauthorised use by access control measures.	non-substantive	SMDG needs to define the extent of the 'ring-fenced' HAN/WAN vs. any 'open' consumer accessible local networking environment (consumer WLAN etc)	

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SP.12	The smart metering system shall ensure that only authorised devices may connect to the smart meter.	non-substantive	SMDG needs to define the extent of the 'ring-fenced' HAN/WAN vs. any 'open' consumer accessible local networking environment (consumer WLAN etc)	
SP.13	The smart metering system communications shall be designed and implemented to restrict the numbers of smart meters that are visible to each other to preven	non-substantive	OK at a HAN level, but may have DCC implications – DECC should examine any likely limitations caused by this requirement on the possible use of alternate WAN technologies	
SP.14	The smart metering system shall incorporate security logging for physical tampering and electronic security events.			
SP.15	The smart metering system shall follow the principle of least privilege.			
SP.16	The smart metering system shall follow a secure development lifecycle for software.			
HA.1	The HAN interface shall be based on open and non proprietary standards.			
HA.2	The HAN interface shall only support authorised devices (i.e. no unauthorised linking of devices).			
HA.3	The HAN interface shall support real-time two way communication from mains powered nodes (5s delay/update).			

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HA.4	The HAN interface shall support network coordinator functionality for smart meter system components.	substantive	Remove	This is not a HAN function per se – more a comms hub function. Important not to prescribe limiting demands on the HAN that are unnecessary
HA.5	The HAN interface shall be independently certified and tested for interoperability.			
HA.6	The HAN interface shall support operation over the radio frequency physical layer.			
HA.7	The HAN interface shall support appliance control events (minimum 100 events per 24 hour period, minimum response rate of 5s once signal sent from HAN interface).			
HA.8	The HAN interface shall support the use of repeaters, boosters, etc. to extend range.			
HA.9	The HAN interface shall support acknowledgement of signals.			
HA.10	The HAN interface shall support 30 minute update (wake up) frequency from battery powered nodes	non-substantive	The HAN interface shall support low power features for battery powered devices	We don't care how its done, a technology may exist that allows wake up more frequently than 30 min. The wording here is too specific
HA.11	The HAN interface shall be remotely upgradeable			

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HA.12	The HAN interface shall support gateway/bridging devices to access data made available on the HAN.	substantive	The HAN interface shall support gateway/bridging devices to access data made available on the HAN in a secure manner.	This requires further definition in line with the security specifications. Bridging devices gaining access to metering and other data could impact on security and privacy
HA.13	The HAN shall support a defined application profile for devices that connect to the HAN.	non-substantive	The HAN shall support standard protocols for devices that connect to it	Too technology specific as it stands
HA.14	The HAN shall support alphanumeric messaging.	non-substantive	The HAN shall support text messaging	
HA.15	The HAN shall support the security and privacy requirements.			
HA.16	The HAN shall be capable of supporting other utility meters where the data requirements do not exceed those of gas and electricity smart meters.			
HA.17	The HAN shall be capable of being physically switched on and off by authorised personnel.			
HA.18	The HAN shall support addition of new devices classes.			
HA.19	The HAN shall be backwards compatible.			
HA.20	The HAN shall be used by all smart metering system components in a consumer premise.	non-substantive	Upon initial installation, the HAN shall be used by all smart metering system components in a consumer premise.	Later upgrades may dictate other solutions.
HA.21	The HAN shall not interfere with existing accredited premise HANs.			

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ID	Requirement	Change category	Suggested change wording	Justification (short description)
WA.1	The WAN interface shall be based on open and non proprietary standards.			
WA.2	The WAN interface shall support real-time interrogation of WAN enabled devices with response rate of 1 minute or better.			
WA.3	The WAN interface shall support acknowledge signals.			
WA.4	The WAN interface shall be independently certified and tested for interoperability.			
WA.5	The WAN shall support the security and privacy requirements – set out in the earlier section of the Catalogue.			
WA.6	The WAN shall be capable of being physically switched on and off by authorised personnel.			
WA.7	The WAN shall support simultaneous communication with a large number of meters within a short timescale	non-substantive	This requirement needs better definition - how many meters, withing what timescale and for what purpose?	
IH.1	The IHD shall support mains power operation.			

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IH.2	<p>The IHD shall show the following information for gas and electricity:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Indicative real-time usage in kW; <input type="checkbox"/> Indicative real-time rate of consumption in pence per hour; <input type="checkbox"/> Accurate cumulative consumption in kWh and £ for current day/week/month/billing period; <input type="checkbox"/> A high-level requirement that historical data should be presented in a meaningful way so as to allow a consumer to compare current usage with past usage; <input type="checkbox"/> Accurate account balance information (amount in credit or debit) in real time for prepayment customers and on at least a monthly basis for credit customers; <input type="checkbox"/> Current tariff (i.e. cost per unit in pence per kWh); <input type="checkbox"/> Local time; <input type="checkbox"/> Status of communication link <p>All information will be displayed in digital numerical format as a minimum. In addition, information on real-time energy rate (kilowatt) and cost of current level of consumption (pence per hour) will, as a minimum, be displayed in a visual (non numerical) way which allows a consumer to easily distinguish between low and high current consumption.</p>			
IH.3	The average IHD power consumption shall be less than 0.6W.			