Data Communications Company

Communications Hubs & Networks Consultation on Changes to the Intimate Communications Hub Interface Specification (ICHIS)

A consultation on proposed changes to the Intimate Communications Hub Interface Specification (ICHIS) to support the introduction of new 4G Communications Hubs.

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1. Introduction and context

1. The Data Communications Company (DCC) is Britain's digital energy spine, supporting the transformation of the energy system. DCC is licensed by the Government and regulated by the energy regulator Ofgem to connect smart meters in homes and small businesses across Great Britain to a single secure, digital network. DCC supports the roll-out of second-generation (SMETS2) smart meters, as well as the migration of existing first-generation (SMETS1) meters onto its network.

2. The Communications Hubs and Networks Programme (CH&N) is a DCC initiative geared towards defining and delivering future-proof Communications Hubs & Networks in the Central and South regions with an efficient supply chain and a targeted longevity of at least 15 years. To ensure this longevity of smart functionality DCC is developing a solution to allow for the introduction of new Communications Hubs (CHs) which use the 4G network. To achieve this, DCC established the CH&N Programme to assess development and implementation options for a 4G solution.

1.1. Background

3. The delivery plan for the CH&N Programme[1] includes several DCC Licence Condition 13B milestones, one of which is 'RF Noise Limits confirmed' with a milestone date of 10 January 2024. This milestone marks the point at which DCC will have published the updated Intimate Communications Hub Interface Specification (ICHIS) with Radio Frequency (RF) noise limits for 4G CHs with requisite testing environments and equipment made available.

4. ICHIS defines the mandatory features required to ensure that an Intimate Communications Hub can be used with any ICHIS compliant Host (the side of an ICHIS interface which provides power and physical mount for a device). It defines a common interface between the Communications Hub and Electricity Smart Metering Equipment (ESME).

5. The Smart Energy Code (SEC) Section H12.5 requires the DCC to keep the ICHIS under review to ascertain whether the specification remains fit for purpose as envisaged by the SEC. As set out in the CH&N delivery plan, DCC committed to consulting with stakeholders as to whether they consider the updated specification to be fit for purpose for the introduction of 4G CHs.

1.2. Purpose of the consultation

6. The purpose of this consultation is to obtain views on proposed changes to the ICHIS to support the introduction of 4G CHs, including setting a new RF noise limit for new installations in the Vodafone 4G frequency band, and seek stakeholders' views prior to amending an updated version of the document.

7. This consultation is expected to impact Large and Small Suppliers and Other SEC Parties including Device Manufacturers and Meter Asset Providers (MAPs).

8. This consultation will close on Thursday 4 January 2024 at 12:00.

[1] Conclusions on the revised delivery plan for the CH&N Programme | Smart DCC

2. Proposed changes to ICHIS

2.1. Introduction of new frequency bands and CHAS

9. CH&N will introduce a new CH Variant which will operate in the Vodafone allocation of the Long Term Evolution (LTE) Category 1 frequency band (801-811MHz)[2], which is not currently included in the ICHIS.

10. As set out in Part F1.1 of the ICHIS, "it is necessary to consider the influence of the Host and Device on one another". This is achieved by the specification of noise limits applicable to the Host within the ICHIS. Host devices which emit noise greater than specified limits may impact the receiver sensitivity of the CH of interest and in turn this may potentially impact Wide Area Network (WAN) coverage.

11. ICHIS Part F2.0 sets out the testing methodology for radiated (wireless) RF interference with Host devices. DCC propose that this section is updated to include the Vodafone allocation for LTE Category 1 frequency band (801-811MHz).

12. ICHIS Part F4.5 sets the pass criteria for Hosts testing against each frequency band. DCC propose that the pass criteria for the new frequency band is consistent with the existing frequency bands as set out in the ICHIS (except for the Fylingdales which currently requires additional testing criteria). DCC is accordingly proposing to update this section to include the Vodafone allocation of the 800MHz LTE Category 1 frequency band and provide definitions of 2SD and 3SD values used in the pass criteria.

13. Testing of the Host against each frequency band is conducted by using test equipment known as a Communications Hub Antenna Structure (CHAS) unit and these are detailed in Appendix A of the ICHIS. The introduction of a new 4G CH and frequency band will require a new CHAS unit and therefore, DCC propose adding requirements to Appendix A for the new Toshiba 4G Cellular Dual Band CH. This includes the rationale for selection and CHAS antenna placement.

Q1	Do you agree with DCC's proposal to amend the ICHIS Part F2.0, Part F4 and Appendix A to include the new frequency band (801-811 MHz) and new CHAS unit? Please provide your rationale.

2.2. Radio Frequency noise limits for new frequency bands

14. As part of work undertaken with Vodafone to understand the technical requirements underpinning WAN Coverage, DCC worked with Vodafone to establish the permitted amount of composite noise that could be tolerated to achieve a functioning WAN at the contracted volume of installation premises. Composite noise is the cumulative of the CH's modem noise and meter noise.

15. As the levels of meter noise in the Vodafone LTE frequency band was unknown for Host devices (Electricity Smart Metering Equipment (ESME)) currently being deployed, DCC undertook noise measurements for all 7 currently active ESME Device Manufacturers in the LTE Category 1 bands to analyse potential impacts on the 4G WAN and to assist in determining an appropriate meter noise limit for the new frequency band.

[2] Host device noise limits in the 4G LTE Category 1 frequency bands are required to ensure contracted Wide Area Network (WAN) coverage requirements are met. The 4G CH uses the Frequency Division Duplex (FDD) spectrum Band 20 which provides a pair of bands one for receive and one other for transmit. Host device noise impacts the receive bands and therefore the RF noise limit is set for these bands.

16. The DCC's testing approach included the qualification of the 4G CHAS for use in noise testing by using a single ESME sample from each of the 7 Device Manufacturers. This testing qualified the 4G CHAS for use in noise testing as described in the ICHIS.

17. Testing was then conducted at Plextek[3] with qualified 4G CHAS devices against the latest version of ESME for these 7 Device Manufacturers using the eight-meter test, as described in the ICHIS. These Devices were confirmed bilaterally to be the Devices currently being deployed by Suppliers. Testing was conducted across LTE Cat 1 frequency bands to establish the permissible ESME noise level with the aim to determine a proposed noise limit for inclusion in the ICHIS.

18. Following these tests, DCC held bi-lateral discussions with Device Manufacturers to establish whether the samples tested at Plextek were representative of all Device Models currently offered by each Device Manufacturer. This was achieved through leveraging the Device Manufacturers' understanding of the noise impacting changes made between different hardware and firmware versions. Manufacturers provided evidence from previous noise testing to confirm that noise profiles were comparable to those seen in the eight-meter test undertaken at Plextek. The outcome of this assurance is that DCC consider the testing and design assurance undertaken to be indicative that the Devices tested are representative of a significant portion of the estate.

19. To support any further testing, CHAS Devices have been made available for use by Device Manufacturers in their own testing, through request to the DCC[4], and noise testing services may be accessed through Plextek from Thursday 7 December 2023. DCC would encourage Device Manufacturers to update the SECAS maintained ICHIS Noise Results spreadsheet[5] as appropriate. DCC can provide results and statements of conformity from the testing undertaken at Plextek, should a Device Manufacturer wish to utilise this.

20. Initially in the CH&N delivery plan, DCC stated that stakeholders will have the opportunity to test against indicative noise limits at DCC Test Labs[6] from Q3 2023. Due to delays to implementing noise testing capability in the DCC Test Labs, the DCC Test Labs are expected to be available from January 2024.

21. Whilst DCC is confident that the testing and bilateral reviews of Host devices is sufficient to propose a noise limit for new installations in the Vodafone allocation of the LTE Category 1 800MHz frequency band, this consultation seeks stakeholder's views on whether industry agrees that the testing approach is sufficient and ESME will meet the new proposed noise limit for the Vodafone allocation.

22. DCC therefore propose that the noise limit is set within Appendix B of the ICHIS at **≤3 dB** for the 801–811MHz frequency band. This is the same limit level as is currently set for 3G. The actual noise measurement across all devices tested was well below 3dB. The limit was set at the maximum permissible noise from the ESME.

23. Following the consultation and subject to responses, DCC will publish a new version of the ICHIS, at which point the noise limit will apply for future installations in the 801–811MHz frequency band.

Q2	Do you agree that the 801–811MHz noise limit should be set based on the approach taken by the DCC? Please provide your rationale.

[3] Plextek is an independent test service procured for RF noise testing
[4] A communication was sent by DCC directly to Device Manufacturers on 20th December with the availability of CHAS
[5] ICHIS Noise » (smartenergycodecompany.co.uk)
[6] RF Noise testing will be available in DCC's Brabazon House (Manchester) as part of CH&N testing activities and as an enduring Testing Service in accordance with SEC Section H

Q3	Do you agree with the proposed noise limit of 3dB for the 801–811MHz frequency band as set out in the draft ICHIS v3.0? Please provide your rationale.

3. Future flexibility

23. CH&N is a disaggregated solution that provides flexibility of switching component suppliers. The 4G CH is designed with this in mind, it is designed to operate in the 700MHz and 800MHz bands of LTE Category 1, this is to allow the flexibility to switch Mobile Network Operators (MNOs).

24. To support this future flexibility, the DCC intends to further work with industry to consider extending RF noise limits for new installations to the remainder of the 800MHz frequency band (791-821 – excluding 801-811) as well as the 700MHz frequency band (758-803) in a future version of the ICHIS.

25. It is DCC's view that declaring limits for the 700MHz band and the remainder of the 800MHz band ahead of their being required for new installations would give industry useful notice of the potential future use of these bands and the limits to be achieved. DCC also recognises that Device Manufacturers will require sufficient time to test ESME against the remainder of the 800MHz frequency band and 700MHz frequency band to assess the impacts of any future noise limits that may be proposed. DCC will also seek to work with Device Manufacturers to establish any timescales associated with assessing changes required to ESME to meet any proposed limits and potential implementation of these changes. This consultation therefore seeks any stakeholder views on this intent to engage and consult on extending RF noise limits for new installations in the future.

Q4	Do you agree with DCC's intent to include noise limits for LTE Bands other than Vodafone in a future version of the ICHIS? Do you have a view on an appropriate timeline for doing so taking account of testing and implementation? Please provide your rationale.

4. Next steps

26. During the consultation we will seek to engage all impacted stakeholder via SEC Sub-Committees, ICHIS WG and any other bespoke mechanisms as appropriate. This includes presenting at the ICHIS WG on 6 December 2023 and the SEC Communications Transition Group (CTG) on 11 December 2023.

27. Following the closure of this consultation, DCC will take into account respondents' views. Depending on stakeholder responses to this consultation DCC will amend the ICHIS as appropriate and publish an amended version on the DCC Website along with a DCC response document outlining the decision.

28. DCC will also provide in its conclusions document further information on its plan to engage with industry in relation to installed devices and future flexibility. This will include information on engagement plans with all impacted parties via dedicated workshops, ICHIS WG and future consultation publications.

5. How to respond

Please provide responses by 12:00 on Thursday 4 January 2024 to DCC at consultations@smartdcc.co.uk.

Consultation responses may be published on our website www.smartdcc.co.uk. Please state clearly in writing whether you want all or any part, of your consultation to be treated as confidential. It would be helpful if you could explain to us why you regard the information you have provided as confidential. Please note that responses in their entirety (including any text marked confidential) may be made available to the Department for Energy Security and Net Zero (The Department) and the Gas and Electricity Markets Authority (the Authority). Information provided to The Department or the Authority, including personal information, may be subject to publication or disclosure in accordance with the access to information legislation (primarily the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004). If The Department or the Authority receive a request for disclosure of the information, we/they will take full account of your explanation (to the extent provided to them), but we/they cannot give an assurance that confidentiality can be maintained in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded by us as a confidentiality request.

If you have any questions about the consultation documents, please contact DCC via consultations@smartdcc.co.uk.

6. Attachments

- Attachment 1: ICHIS Draft v3.0 – Tracked Changes
- Attachment 2: CHN Changes to the ICHIS Response Template