Heat Network Technical Assurance Scheme

Existing Heat Networks

Technical Specification

Performance Improvement Plan

Milestone 3A

HNTAS-EX-TS-XX-M3A

Version History

Revision	Notes	Date
V0.1	Draft issue	17/12/25

Disclaimer

The following HNTAS Code document is published in draft format. This document is intended to give the sector early sight of HNTAS requirements in their current stage of development for the purpose of facilitating sector understanding of the scheme.

Draft Code documents, including Technical Specifications and Assessment Procedures, have been reviewed and consulted on through a series of technical workshops with participation from a range of experts from across the heat network industry. The content of this document is still in development and subject to change. Requirements should not be considered as fixed at this stage.

Changes which may be made to this document in future include those to:

- reflect learnings from the New Build and Existing network pilot programmes;
- align with aspects of HNTAS which are subject to public policy consultation;
- align with new requirements in TS1 and MMS;
- align the terminology of this document with that used in other HNTAS documentation;
- rectify errors in this draft version; and
- improve clarity of contents.

The Key Failures set out in the draft Code documents have been identified as a specific area for review, to ensure that:

- all Key Failures enable a binary assessment;
- Key Failures are only included for genuine issues presenting major risks to KPIs, and that moderate or lower risks are considered via non-conformity processes; and
- Key Failures do not duplicate Technical Requirements unless there is a clear justification to do so.

DESNZ will be welcoming feedback on the information in this document via a change management process. This process will run in parallel to the HNTAS policy consultation and DESNZ invites stakeholders to engage with both, once they are open. You can sign up to receive updates on future detailed draft technical documents as they are published by contacting: heatnetworks@energysecurity.gov.uk.

Please be advised that this document references other HNTAS draft Code documents which have not yet been published. References to other documents will also be subject to change following the publication of updated standards. The final version of this document will be released before the launch of HNTAS.

Contents

Foreword

This Technical Specification forms part of the UK Government's Heat Network Technical Assurance Scheme (HNTAS, The Scheme) delivered by the Department for Energy Security and Net Zero, in partnership with the Scottish Government and Ofgem. The Department for Energy Security and Net Zero appointed FairHeat as technical author for this document.

The Scheme has been designed and developed in consultation with a range of experts across the heat network industry in the form of Technical Sub-Working Groups, culminating in a series of Technical Specifications and Assessment Procedures to facilitate the validation and verification of performance outcomes of Elements within a Heat Network.

This document specifies HNTAS Requirements for all Elements within an Existing Heat Network required at Milestone 3A.

This document sits within a series of Technical Specifications for an Existing Heat Network as outlined in Table 1.

This Technical Specification has been issued in draft format and will be updated prior to scheme launch.

For further information on the use of this document within the Heat Network Technical Assurance Scheme, please refer to the Heat Network Technical Assurance Scheme – Existing Heat Networks – Scheme Rules – Assessment Regime (HNTAS-EX-SR-XX-AS) document.

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Shadow Code Management Committee

During the development of HNTAS, a Shadow Code Management Committee has been established, with representation from the Department for Energy Security & Net Zero (DESNZ), the Scottish Government, Ofgem and Heat Trust. The following items have been presented to, and approved by, this committee:

- Structure of Code documents for Existing Heat Networks
- Approach to Technical, Performance Monitoring and Data Protection and Smart Metering Requirements at each Milestone
- KPIs and thresholds at each Milestone

Code Document Structure

Technical Specifications

Document Type	Element		Milestone					
			Overview	Milestone 2	Milestone 3A	Milestone 3B	Milestone 4	Milestone 5
			M0	M2	M3A	M3B	M4	
Technical Specification	Energy Centre	EC	HNTAS-EX-TS-XX-M0	HNTAS-EX-TS-EC-M2	HNTAS-EX-TS-XX-M3A	N/A	HNTAS-EX-TS-EC-M4	HNTAS-NB-TS-EC-P4
	District Distribution Network	DD		HNTAS-EX-TS-DD-M2		N/A	HNTAS-EX-TS-DD-M4	HNTAS-NB-TS-DD-P4
	Substation	SS		HNTAS-EX-TS-SS-M2		N/A	HNTAS-EX-TS-SS-M4	HNTAS-NB-TS-SS-P4
	Communal Distribution Network	CD		HNTAS-EX-TS-CD-M2		N/A	HNTAS-EX-TS-CD-M4	HNTAS-NB-TS-CD-P4
	Consumer Connection	CC		HNTAS-EX-TS-CC-M2		HNTAS-EX-TS-CC-M3B	HNTAS-EX-TS-CC-M4	HNTAS-NB-TS-CC-P4

Table 1: Existing Network Technical Specification structure

Scope

This document specifies the HNTAS Requirements for all Elements within an Existing Heat Network at Milestone 3A.

Within the assurance pathway for Existing Networks, Milestone 3A involves the production and assessment of the Performance Improvement Plan (PIP). This plan details and evidences how a Responsible Party intends to improve network performance and reliability to the threshold required to achieve Certification.

To reduce complexity, the PIP is to be completed on a network-level, including detail on all applicable Elements, rather than on an individual Element-basis. One PIP can also be submitted for multiple networks in the case that these networks have the same Responsible Party and are connected (for example when a District Distribution Network is connected to multiple Communal Distribution Networks).

As such, the Responsible Party is expected to submit as few PIPs as possible for each network or set of networks they are responsible for (in most cases, one PIP will sufficiently capture all applicable network Elements).

Within the PIP, the individual Elements within each network shall be identified, to ensure consistency with the rest of the Scheme and assurance pathway for Existing Networks.

A PIP can also be submitted for an individual Element where appropriate.

References

Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- Heat Network Technical Assurance Scheme – Existing Heat Networks – Scheme Rules – Assessment Regime (HNTAS-EX-SR-XX-AS)

Informative references

The following informative references apply to this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- Heat Network Optimisation Guide (HNOG) (DESNZ, 2023)
- BS EN ISO 12241:2022 – Thermal insulation for building equipment and industrial installations – Calculation rules (ISO, 2022)
- BESA UK HIU Test Regime (BESA, 2023, or latest edition)

Terms and Definitions

For the purposes of this document, the terms and definitions given in the Heat Network Technical Assurance Scheme – Terms and Definitions (HNTAS-XX-TD) document apply.

M3A. Requirements for Milestone 3A

M3A.1. Technical Requirements

The applicable HNTAS Technical Requirements in Table 2 shall be fulfilled.

Technical Requirement		Evidence Requirement(s)
M3A.1.1.	All networks and Elements included in the PIP shall be clearly identified, with all dependencies between them detailed.	M3A-E01 M3A-E02 M3A-E03
M3A.1.2.	Where an upstream network/Element(s) supplies the network(s)/Elements covered by the PIP, any dependencies on that network/Element(s) shall be clearly identified.	M3A-E01 M3A-E02 M3A-E03
M3A.1.3.	Baseline KPI values shall be established, reflecting the performance of the network(s)/Element(s) at the time of PIP submission. KPI values shall be obtained via one of the following methods, in order of precedence: 1. Where values are available on the Digital Platform, the most recent applicable value shall be extracted and the timestamp shall be indicated. 2. Values shall be obtained using data collected from the Metering and Monitoring System and/or during a site audit. 3. Values shall be modelled using suitable calculation tools and assumptions. For values that cannot be determined via the methods above, these KPIs will be assumed to be non-compliant with Milestone 4 thresholds, unless sufficient evidence is provided to justify the exclusions. KPI values shall be determined up to a maximum of 3 months before PIP submission.	M3A-E04 M3A-E05 M3A-E06 M3A-E07 M3A-E08 M3A-E09 M3A-E10
M3A.1.4.	For each Element, the baseline KPI values, reflecting current performance, shall be reviewed against the Milestone 4 thresholds to identify which KPIs require improvement to achieve conformity with Milestone 4.	M3A-E04 M3A-E05

Technical Requirement		Evidence Requirement(s)
M3A.1.5.	A root cause analysis shall be conducted to determine the design, install, commissioning and/or operational issues contributing to the identified performance gap. Root cause analysis can be undertaken by: 1. Establishing the facts and information relevant to the issue, including a timeline from normal operation to the issue occurring. 2. Establishing likely causes based on the facts. 3. Undertaking tests and analysis to verify actual root cause(s) where applicable.	M3A-E03 M3A-E04
M3A.1.6.	A site audit shall be conducted in order to inform the root cause analysis, ensuring that minimum audit requirements are met in accordance with HNOG Section 4.5.	M3A-E05
M3A.1.7.	The interventions required to sufficiently address the root cause issues shall be identified. The chosen interventions shall improve performance to enable KPIs to comply with Milestone 4 thresholds. The technical rationale of how conformity with Milestone 4 will be achieved shall be justified for each KPI.	M3A-E03 M3A-E11 M3A-E12

M3A.1.8.	The expected KPI performance following implementation of all remedial and preventative interventions shall be justified as follows:
	• KPIs listed within the 'KPIs requiring calculation evidence' section of the PIP:
	  ○ Calculation evidence shall be provided detailing the methodology of obtaining the specified values. These modelled KPIs shall demonstrate conformity with the Milestone 4 thresholds.
	• KPIs listed within the 'KPIs requiring qualitative justification' section of the PIP:
	  ○ Justification of how conformity with Milestone 4 shall be provided qualitatively, with reference to linked interventions.
		M3A-E06
		M3A-E07
		M3A-E08
		M3A-E09
		M3A-E10
		M3A-E11

M3A.1.9.	A project programme shall be produced which indicates the timelines in which the proposed interventions are likely to be implemented. Any known dependencies between interventions shall be highlighted in the programme.	M3A-E12

Technical Requirement		Evidence Requirement(s)
M3A.1.10.	It shall be demonstrated that the Study Lead (and Study Engineer if applicable) who completed the PIP have the minimum knowledge and experience as set out in HNOG Section 2.3.	M3A-E13
M3A.1.11.	The PIP shall be completed in line with the template [HNTAS-PerformanceImprovementPlan-Template] and issued with all applicable supporting evidence to the Assessment Organisation.	M3A-E14

Table 2: Technical Requirements at Milestone 3A

M3A.2. Evidence Requirements

The applicable Evidence Items listed in Table 3 shall be provided to demonstrate fulfilment with the Technical Requirements, Performance Monitoring Requirements, and avoidance of Key Failures.

Evidence Item		Detailed description and requirements
M3A-E01	Site map	Sitewide layout drawings and schematics as required to evidence the overall layout of the network and allow simple identification of all Heat Network Elements within the PIP and any upstream Elements or networks. Where there are upstream networks, the Elements within these networks do not have to be identified.
M3A-E02	Consumer schedule	Schedule which provides a breakdown of all end consumers served by the Heat Network. For domestic connections, the number of Consumer Connection types and the number of dwellings within each type shall be outlined. Guidelines on how to distinguish the Consumer Connection types are provided within the Guidance sheet of the PIP template [HNTAS-PerformanceImprovementPlan-Template]. For non-domestic connections, or non-typical domestic connections, the heat capacity of each end consumer shall be detailed.
M3A-E03	Drawings	Drawings of: • the current network arrangement, before any intervention works; and • the proposed network arrangement, following all intervention works. The following drawings shall be provided and shall contain sufficient information to understand the scope of intervention works for all Elements covered within the PIP: • schematics; and • drawings (layout, plan, elevation).
M3A-E04	Root cause analysis report	Evidence shall provide an analysis of information from site audit records, data from the Metering and Monitoring System or other information. The root causes of performance and reliability issues on the Heat Network shall be identified, together with the corresponding KPIs affected. The report may be also used to inform baseline values for any KPIs obtained via data collection (i.e. not from the modelling calculations).
M3A-E05	Site audit records	Evidence shall detail findings from recent site audit(s).

Evidence Item		Detailed description and requirements
		This evidence shall be in the form of reports or clear photographic evidence. Site audit records may also be used to inform baseline values for any KPIs obtained via data collection (i.e. not from the modelling calculations).
M3A-E06	Heat loss model	Evidence shall contain the expected network heat loss KPI values, following implementation of the proposed interventions. This shall be conducted for all District and Communal Distribution Networks within the PIP. Calculations may also be used to evidence baseline KPI values, before the proposed improvement interventions. All inputs, methodology, assumptions and outputs shall be clearly outlined, as well as the performance boundaries of the District/Communal Distribution Networks considered for the heat loss calculation. The heat loss model shall be produced in accordance with BS EN ISO 12241. Section 5.3 of HNOG provides guidance of how heat losses can be calculated in sufficient detail.
M3A-E07	Heat fraction and generation efficiency calculations	Evidence shall contain calculations of the expected heat fraction and heat generation efficiency KPI values, following implementation of the proposed interventions. This shall be conducted for all Energy Centres within the PIP. Calculations may also be used to evidence baseline KPI values, before the proposed improvement interventions. All inputs, methodology, assumptions, and outputs shall be clearly outlined.
M3A-E08	Pump energy consumption calculations	Evidence shall contain calculations of the expected network pump energy consumption KPI values, following implementation of the proposed interventions. This shall be conducted for all Energy Centres and Substations within the PIP. Calculations may also be used to evidence baseline KPI values, before the proposed improvement interventions. All inputs, methodology, assumptions, and outputs shall be clearly outlined. Section 5.4 of HNOG provides guidance of how the pump energy consumption can be calculated in sufficient detail.

Evidence Item		Detailed description and requirements
M3A-E09	Network bypass flow rate calculations	Evidence shall contain calculations of the expected network bypass flow rate KPI values, following implementation of the proposed interventions. This shall be conducted for all District and Communal Distribution Networks within the PIP. Calculations may also be used to evidence baseline KPI values, before the proposed improvement interventions. All inputs, methodology, assumptions, and outputs shall be clearly outlined. Section 5.2.3 of HNOG provides guidance of how the network bypass flow rate can be calculated in sufficient detail. Alternatively, proposed network drawings demonstrating the absence of network bypasses may be provided instead of calculations.
M3A-E10	VWART and VWATD calculations	Evidence shall contain the expected VWART and VWATD KPI values, following implementation of the proposed interventions. This shall be conducted for all types of Consumer Connection within the PIP. Calculations may also be used to evidence baseline KPI values, before the proposed improvement interventions. Where current performance data cannot be used to estimate expected KPI values following all improvement works, temperatures should be analysed during standby/keep-warm, domestic hot water, and space heating operation. On the basis of these calculations, reasonable VWART and VWATD values should be proposed. All inputs, methodology, assumptions and outputs shall be clearly outlined. Section 5.2.2 of HNOG provides guidance of how volume weighted average temperatures can be calculated in sufficient detail. Appendix C of the BESA Technical Standard for UK HIU Test Regime provides guidance of how temperature analysis under different modes of HIU operation can be used to estimate VWART values.
M3A-E11	Scope of works	Breakdown of the proposed improvement interventions. Any selected measures shall be justified in the context of the KPIs influenced. This shall be in the form of an options appraisal, optimisation study, detailed scope of works or equivalent document. Where multiple options for proposed interventions are provided, it shall be clear which option has been chosen.

Evidence Item		Detailed description and requirements
M3A-E12	Project programme	Programme mapping out timescales for the project. Realistic start and end times for each of all proposed works shall be identified. Any known dependencies between interventions shall be highlighted in the programme. Sufficient contingency shall be included to ensure project completion and conformity by the Milestone 4 deadline. Project timelines shall be presented in a clear and easily interpretable form, such as in a Gantt chart.
M3A-E13	Previous experience and competence	All parties involved in the production of the PIP shall be identified, and their relevant skills, experience and competence shall be provided. A Study Lead (and Study Engineer if applicable) shall be identified and shall meet the minimum requirements specified in HNOG Section 2.3, including: • Knowledge and skills; • Qualifications; and • Previous experience.
M3A-E14	Completed PIP	A completed Performance Improvement Plan, with all required input fields and tabs correctly populated. Evidence shall match the form of the PIP template [HNTAS-PerformanceImprovementPlan-Template].

Table 3: Evidence Requirements at Milestone 3A