Heat Network Technical Assurance Scheme

New Build Heat Networks

Assessment Procedures

Substation

Phase 2: Design

HNTAS-NB-AP-SS-P2

Version History

Revision	Notes	Date
V0.4	Draft issue	05/12/25

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.

Note on Phase 4: Operation (initial) and Phase 5: Operation (ongoing)

The New Build Technical Specification and Assessment Procedures Overview (Phase 0) documents indicate that there are separate New Build Code Documents for Phase 4: Operation (initial) and Phase 5: Operation (ongoing).

These documents have since been consolidated to reduce the number of Code Documents, so the Phase 4: Operation documents cover requirements for New Build networks during both initial and ongoing operation.

This change does not impact the assessment of New Build networks in operation, which still occurs:

- after 1 year of operation; and
- after 2 years of operation.

Contents

Foreword

These Assessment Procedures form 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 contains the Assessment Procedures for a Substation Element within a New Build Heat Network in Phase 2: Design.

This document sits within a series of Assessment Procedures for a Substation, which features within a wider Code documentation structure, as outlined in Table 1.

These Assessment Procedures have 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 – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS) document.

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Code Document Structure

Assessment Procedures

Document Type	Element		Part/Phase				
			Overview	Phase 1: Feasibility	Phase 2: Design	Phase 3: Construction	Phase 4: Operation
			P0	P1	P2	P3	P4
Assessment Procedures	Energy Centre	EC	HNTAS-NB-AP-EC-P0	HNTAS-NB-AP-EC-P1	HNTAS-NB-AP-EC-P2	HNTAS-NB-AP-EC-P3	HNTAS-NB-AP-EC-P4
	District Distribution Network	DD	HNTAS-NB-AP-DD-P0	HNTAS-NB-AP-DD-P1	HNTAS-NB-AP-DD-P2	HNTAS-NB-AP-DD-P3	HNTAS-NB-AP-DD-P4
	Substation	SS	HNTAS-NB-AP-SS-P0	HNTAS-NB-AP-SS-P1	HNTAS-NB-AP-SS-P2	HNTAS-NB-AP-SS-P3	HNTAS-NB-AP-SS-P4
	Communal Distribution Network	CD	HNTAS-NB-AP-CD-P0	HNTAS-NB-AP-CD-P1	HNTAS-NB-AP-CD-P2	HNTAS-NB-AP-CD-P3	HNTAS-NB-AP-CD-P4
	Consumer Connection	CC	HNTAS-NB-AP-CC-P0	HNTAS-NB-AP-CC-P1	HNTAS-NB-AP-CC-P2	HNTAS-NB-AP-CC-P3	HNTAS-NB-AP-CC-P4
	Consumer Heat System	CH	HNTAS-NB-AP-CH-P0	HNTAS-NB-AP-CH-P1	HNTAS-NB-AP-CH-P2	HNTAS-NB-AP-CH-P3	N/A

Table 1: New Build Network Assessment Procedures structure

Scope

This document specifies the Assessment Procedures applicable for a Substation within a New Build Heat Network in Phase 2: Design.

A Substation is defined as a connection between Distribution Networks, which contains an exchange of thermal energy (e.g. via plate heat exchangers), together with requisite ancillary equipment, or a connection between a Distribution Network and a single Consumer Heat System, where the instantaneous hot water system is greater than 70 kW and/or space heating system is larger than 20 kW.

A detailed definition of the Substation is contained within the Heat Network Technical Assurance Scheme – New Build Heat Networks – Technical Specification – Substation – Overview (HNTAS-NB-TS-SS-P0) document.

Detailed definitions of the Levels of Assessment specified in this document are provided in Heat Network Technical Assurance Scheme – New Build Heat Networks – Assessment Procedures – Substation – Overview (HNTAS-NB-AP-SS-P0).

New Build Heat Networks

There are two stages within Phase 2: Design, which are Stage 2: Developed Design and Stage 3: Technical Design. This is outlined in Figure 1.

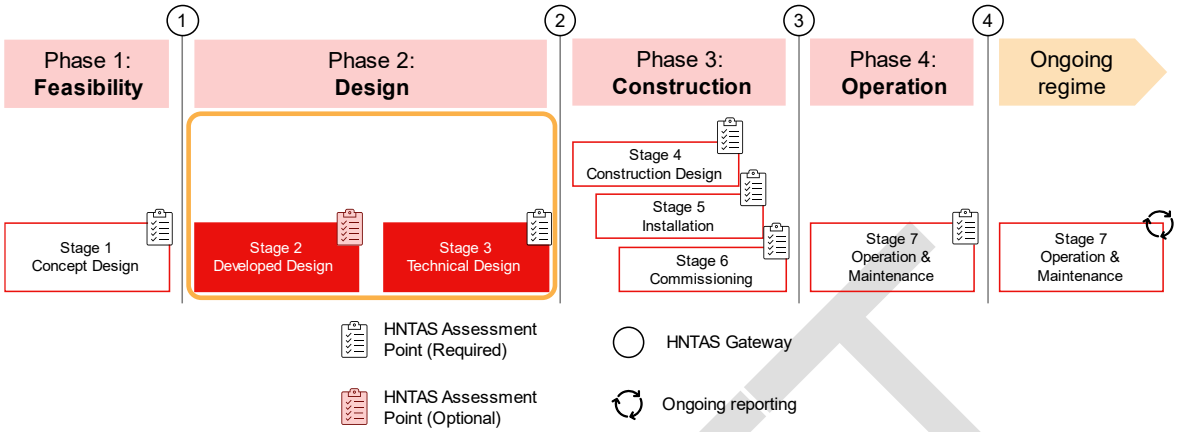

Figure 1: HNTAS New Build regime phases and stages

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 – New Build Heat Networks – Scheme Rules – Assessment Regime (HNTAS-NB-SR-XX-AS)
- Heat Network Technical Assurance Scheme – New Build Heat Networks – Assessment Procedures – Substation – Overview (HNTAS-NB-AP-SS-P0)

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.

- ISO 17029: Conformity Assessment – General principles and requirements for validation and verification (ISO, 2019)

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.

2. Assessment Procedures for Stage 2: Developed Design and Stage 3: Technical Design

2.1. Assessment of Technical Requirements

For each HNTAS Technical Requirement, the Assessor shall follow the Assessment Procedures and minimum Level of Assessment specified in Table 2.

Technical Requirement	Minimum Level of Assessment	Assessment Procedure
2.1.1.	3	Confirm that the assumptions made and methodology used to calculate peak heat demand and annual heat consumption are in accordance with the applicable technical standard(s).
2.1.2.	3	Review the direct and indirect connection assessment and confirm that the assumptions made and methodology used to undertake the assessment are in accordance with the applicable technical standard(s).
2.1.3.	5	Undertake an in-depth review to confirm that the domestic hot water systems have been specified and sized in accordance with the applicable technical standard(s). Undertake independent sizing calculations to confirm the accuracy of the outputs.
2.1.4.	3	Review the Substation operating temperature assessment to confirm that the assumptions made and methodology used to determine operating temperatures meet end user/network requirements, heat generation source requirements, and are in accordance with the applicable technical standard(s).
2.1.5.	5	Undertake an in-depth review of the working pressure assessment to confirm that the assumptions made, the methodology used to calculate working pressures, and the outputs of the assessment are reasonable given the design characteristics of the system and are in accordance with the applicable technical standard(s). Where required, undertake independent calculations to confirm the accuracy of the working pressure assessment. Confirm that the identification and assessment of risks from the working pressure assessment has been undertaken in accordance with the applicable technical standard(s) and that mitigation

Technical Requirement	Minimum Level of Assessment	Assessment Procedure
		measures have been considered and implemented where appropriate.
2.1.6.	3	Confirm that the assumptions made and methodology used to specify and size the pressure safety system are in accordance with the applicable technical standard(s).
2.1.7.	5	Undertake an in-depth review to confirm that the inputs, assumptions, and methodology used to size and select the network distribution pumps are in accordance with the applicable technical standard(s) and that the outputs meet the load requirements of the network. Undertake independent sizing calculations to confirm the accuracy of the sizing outputs.
2.1.8.	4	Confirm that the inputs, assumptions, and methodology used to size and select equipment are in accordance with the applicable technical standard(s). Undertake sample independent sizing calculations to confirm the accuracy of the sizing outputs for a sample of key equipment items.
2.1.9.	4	Confirm that the inputs, assumptions and methodology used to size pipework is in accordance with the Substation specific characteristics and the applicable technical standard(s). Undertake independent sample calculations to confirm the accuracy of the sizing outputs.
2.1.10.	3	Confirm that the hydraulic design, control philosophy and initial description of operation (DesOps) of the Substation is in accordance with the applicable technical standard(s).
2.1.11.	3	Confirm that the ancillary equipment requirements are in accordance with the applicable technical standard(s), and that they enable all capital equipment to be safely depressurised, drained, maintained, and that air can be removed from all system high points.
2.1.12.	5	Undertake an in-depth review to confirm that any bypasses present are justified, sized, selected, and located in accordance with the applicable technical standard(s). Review the inputs, assumptions, and methodology used and outputs of bypass sizing, and where

Technical Requirement	Minimum Level of Assessment	Assessment Procedure
		necessary, confirm the accuracy by undertaking an independent sizing assessment.
2.1.13.	3	Confirm that a Resilience Strategy has been developed and that the assumptions made and methodology used to determine the strategy are reasonable.
2.1.14.	3	Confirm that a repair and replacement strategy has been developed in accordance with the applicable technical standard(s).
2.1.15.	5	Undertake an in-depth review to confirm that the Water Quality Strategy is in accordance with the applicable technical standard(s) and is suitable given the system characteristics.
2.1.16.	4	Review the Water Quality Recording Programme to confirm that it has been developed in accordance with the applicable technical standard(s). Undertake a sample check of the water quality parameters and KPI thresholds to confirm they are acceptable. Undertake a sample check of the number of recording locations to confirm they are suitable given the system characteristics.
2.1.17.	3	Confirm that oxygen ingress has been minimised in accordance with the applicable technical standard(s).
2.1.18.	3	Confirm that the risk of areas of stagnation has been mitigated in accordance with the applicable technical standard(s).
2.1.19.	3	Confirm that water quality equipment has been specified in accordance with the applicable technical standard(s).
2.1.20.	3	Confirm that the methodology used to select the pipework insulation type and thickness is in accordance with the applicable technical standard(s).
2.1.21.	2	Confirm that the ventilation strategy has been produced. No review of the contents is required.
2.1.22.	4	Undertake an in-depth review to confirm that spatial requirements and layouts have been determined in accordance with the HNTAS requirement and applicable technical standard(s).

Technical Requirement	Minimum Level of Assessment	Assessment Procedure
		Undertake a sample in-depth review to confirm that the necessary maintenance clearances are present within the design for a sample number of key equipment items.
2.1.23.	3	Review the outline commissioning plan to confirm the inputs are correct, key items are present, the time order of activities appears reasonable and is in accordance with the applicable technical standard(s). This Assessment Procedure is only applicable at Stage 3.
2.1.24.	3	Review the Acceptance Testing methodology and criteria to confirm that the inputs and criteria are correct and key items required to demonstrate performance are present. This Assessment Procedure is only applicable at Stage 3.
2.1.25.	3	Review the list of specialist Heat Network design items to be completed at the Construction Design stage to confirm that the performance specification is present, specification requirements are appropriate for the item type and the applicable HNTAS standards are present. This Assessment Procedure is only applicable at Stage 3.
2.1.26.	3	Review the required drawings and schematics to confirm they are in accordance with the applicable technical standard(s).
2.1.27.	4	Confirm that the Technical Parameters Schedule has been completed (all parameters present, and references to correct documents present). Undertake a review of a sample of parameters to confirm the accuracy of sampled outputs.

Table 2: Assessment Procedures for Technical Requirements at Stage 2: Developed Design and Stage 3: Technical Design for the Substation

2.2. Assessment of Performance Monitoring Requirements

For each HNTAS Performance Monitoring Requirement, the Assessor shall follow the Assessment Procedures and minimum Level of Assessment specified in Table 3.

Performance Monitoring Requirement	Minimum Level of Assessment	Assessment Procedure
2.2.1.	5	Undertake an in-depth review to confirm that the Metering and Monitoring Strategy is reasonable in the context of wider system design and characteristics, and is in accordance with the applicable technical standard(s).
2.2.2.	4	Review the KPI Schedule and ensure that the applicable Substation KPIs are present, and the schedule contains the required content. Undertake a sample check of KPIs to confirm the suitability of KPI thresholds and the required measurement points for sampled KPIs.
2.2.3.	3	Review the Monitoring Points Schedule to confirm that the Monitoring Points required to measure KPIs (listed in KPI Schedule) are present in the Monitoring Points Schedule, and that the schedule contains the required content.
2.2.4.	5	Undertake an in-depth review of the Monitoring Points specification to confirm that it has been determined in accordance with the applicable technical standard(s). Undertake a sample check of the meter sizing methodology and outputs to confirm that the sizing is acceptable. This Assessment Procedure is only applicable at Stage 3.
2.2.5.	5	Undertake an in-depth review of the ARMS specification to confirm that it has been developed in accordance with the applicable technical standard(s). This Assessment Procedure is only applicable at Stage 3.
2.2.6.	4	Undertake a sample review of the data flow diagram(s) to confirm that the inputs are accurate and the diagrams are suitable for the sampled items. This Assessment Procedure is only applicable at Stage 3.
2.2.7.	4	Undertake a review of the schematics to ensure that a sample of necessary Monitoring Points are

Performance Monitoring Requirement	Minimum Level of Assessment	Assessment Procedure
		present and are labelled with the unique ID code correctly.

Table 3: Assessment Procedures for Performance Monitoring Requirements at Stage 2: Developed Design and Stage 3: Technical Design for the Substation