Hydrogen Skills and Standards for Heat Programme

Milestone Verification and Approval – Guidance for Contractors

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# 1 Introduction

This guidance document sets out the process and assessment criteria for verifying that the milestones submitted under evidence gathering contracts of the Hydrogen Skills and Standards for Heat programme have been completed to the satisfaction of DESNZ prior to payment of the related invoices. This document should be read in conjunction with the Invitation to Tender (ITT).

Due to the nature of the work within the programme, this milestone verification process will be critical to ensure high quality outputs are delivered and incorporated into the standards being developed under the programme.

# 2 Milestone Verification

## 2.1 Verification and Review Process

Throughout delivery of the project, DESNZ will expect to review milestones and provide feedback comments. Feedback on milestones will be gathered across the programme team, DESNZ technical specialists, DESNZ policy advisors, and through external technical support.

Dependent on the milestone and evidence being submitted, DESNZ may seek views from HSE to endorse work, alongside comment from the standards bodies (BSI, IGEM and EUS) to ensure outputs will provide the required evidence for incorporation into standards. It is expected that feedback will be issued to contractors two to three weeks following submission.

### Draft report

For the draft report, an extended review process will be implemented. This is to manage reviewer resources appropriately throughout the review process as the draft report is intended to be a comprehensive report, which will be substantially complete in content and should only require minor amendments to produce the final report. More in-depth review at draft report stage is expected to lessen the review time in subsequent milestone reviews for submission of the Final Report and DESNZ SRO sign off.

Part 1

Once the draft report is received, it will undergo an initial quality assurance check from the DESNZ programme team and technical advisor. This is editorial in nature to check for basic or critical omissions. The total review period will be one week. The report will then be returned to contractors to correct any errors. One week is allowed for these amendments.

Part 2

Following the return of the updated report, it will be sent for a technical review to the DESNZ technical reviewer, DESNZ technical support, HSE and standards bodies. The total review period is three weeks.

Feedback comments will be collated and moderated before being returned to contractors through a Review Comments Log, issued alongside a Milestone Verification and Approval Form indicating milestone status:

* Green: Evidence has been sufficiently provided in milestone submission with no amendments required. Milestone approved for payment.
* Amber: Some evidence or detail is missing but this is not considered critical. All feedback comments need to be addressed through an updated milestone submitted at the within the timeframe stipulated by DESNZ. Milestone approved for payment, but updates required.
* Red: Significant evidence and detail is missing. Contractor required to address gaps, update milestone and re-submit. Re-submission date will be agreed between both parties. Milestone rejected for payment.

Any updates to milestones or re-submissions should make clear where information has been amended, removed or new detail added. For example, through ‘Track Changes’ function or by highlighting the updated text by suitable means.

It is expected that milestones will be submitted in accordance with the contractor’s approach to Quality Assurance and sign-off has been undertaken by someone of sufficient seniority within the organisation to take responsibility for the work done. Work delivered must comply with the DESNZ Code of Practice for Research. Further details on Quality Assurance and the Code of Practice can be found in the ITT under Section 4 and Annex B, respectively.

## 2.2 Project Milestones

Descriptions of each milestone and the evidence required for a contractor to demonstrate they have met requirements are provided in Table 1. Further details of the individual outputs required under are outlined within Section 3 of the ITT.

Table 1: Project milestones and verification evidence required for acceptance.

|  |  |  |
| --- | --- | --- |
| No. | Milestone | Verification Evidence Required |
| 1 | DESNZ acceptance of test plan | Production of a complete detailed test plan to include:* Detailed methodology to be used to conduct the experimental phase of work.
* Clear plan of the number of tests, specimens and materials.
* Details of specimen preparations including procedures for producing repeatable samples.
* Details of specialists involved and any external work to be undertaken.
* A detailed project plan clearly showing the critical path to the conclusion of the experimental work.
* Details of equipment to be used in experimental work.
* Quality assurance processes that will be followed, to include calibration and internal review processes.
* References to pertinent literature to support the test methodology selected and discussion of its suitability for demonstrating the performance of the joints to be tested.
* Clear discussion of any limitations of the proposed methodology.
* Confirmation of environmental conditions throughout testing.
* Details of health and safety measures to be followed.

Consideration should be given to the structure of the document such that a version of the document with the technical justification for the approach could be shared with standards bodies and the HSE, it is intended for this to be published as an annex to the final report. It is suggested a version with commercially sensitive information removed be produced for those purposes. |
| 2 | Interim Presentation and Report | Delivery of an Interim Presentation detailing:* Project progress.
* Experimental findings at interim stage (expected to cover at least 50% of the experimental work, to be agreed at the stage gate meeting).
* Schedule to complete work.

Production of an Interim Report detailing:* Executive summary and introduction to project.
* Summary level details of Technical approach, test methods, experimental set-up.
* Analysis of results and outline of considerations for incorporation of evidence into standards.
* Conclusions and any recommendations.
* Technical appendices including supporting analysis and data, as appropriate.

An expected report structure to follow for the report is outlined in Annex A. Contractors are requested to follow the same structure for Interim, Draft and Final reports.It is acknowledged that at the interim stage information may not be fully known and this report will include omissions. |
| 3 | Draft Report | Production of a Draft Report updated from the Interim Report and following completion of all experimental work. It is expected that at draft report stage all sections outlined in the expected report structure will be content complete. |
| 4 | Final Report | Production of a Final Report updated to incorporate feedback provided by DESNZ following submission of Milestone 3.  |
| 5 | DESNZ Sign Off | DESNZ SRO acceptance of the Final Report to be published through agreed dissemination routes. |

# Annex A – Expected Report Structure

Cover sheet

* DESNZ will provide a covering statement explaining the overarching programme of work for the project and how this project sits within it.

Executive Summary

* One page summary of the key aspects of the report stating its purpose, key results supported by values where appropriate, details of standards the evidential work has been incorporated into, and any recommendations for further work or implications for a transition to 100% hydrogen.

1. Introduction

* Description of the requirements for undertaking the project, the scope of work, and the research area it has looked to address.
* Outline of project aims and objectives.

2. Technical Approach

* Provide sufficient details of the technical approach such that the study could be repeated by a suitably qualified organisation.
* Inclusion of test set-ups, experimental procedures (including photos and videos as appropriate), calculations, statistical methods used, software/models employed, description of measurement devices / instruments (including accuracy, precision, standard uncertainty) alongside details of the approach to measurement uncertainty.
* Note any limitations in the technical approach used and any assumptions.

3. Results

* Provide full details of all results required to answer objectives and achieve the requirements of the project.
* Inclusion of suitable visualisations (Tables, Graphs, Figures) to convey results including error bars where appropriate.
* Provide a reflection on the repeatability and reproducibility of the experimental results having implemented and followed the procedure.

4. Incorporation of Research and Evidence into Standards

* Provide details of how the research and evidence developed in the project has or will be incorporated into the standards being developed under the programme (e.g. BSI PAS standards, and/or IGEM enabling standards).
* Provide analysis of the results and the implications for standards.

5. Influence on Potential Transition to 100% Hydrogen

* Provide a summary on the potential influence and impacts the work could have on a transition to 100% hydrogen.

6. Conclusions

* Summary outlining the conclusions of the work, any recommendations and/or further work that needs to be undertaken.
* For each material tested a clear result must be presented, a matrix may be an appropriate way to present this information.

References / Bibliography

* Provide list of all references used in a consistent format / style throughout the report

Annexes

* Test plan
* Other supporting analysis and documents as appropriate

# Annex B – General Guidance on Report Writing and Submission of Data

All outputs and reports shall be submitted to sufficient quality with respect to the following criteria.

General:

* They answer the research questions clearly, in plain English
* They are clearly structured so that information presented in each section of each report is clear
* Connections between sections are clear
* Executive summaries are no more than one page and set out the findings clearly and their relevance to DESNZ policies
* All sections have clear introductions and conclusions (including findings being written concisely upfront)

Use of good quality English:

* They are thoroughly peer reviewed for writing quality
* No jargon is used and all terms are defined and referenced clearly
* All acronyms are written out in full the first time that they are mentioned in each section of each report
* No grammar and phrasing errors are present
* No typos / typographical errors are present
* They contain concise and non-wordy sentences and paragraphs
* They are concise reports that are not too long and do not have vast annexes

Visualisations:

* All visualisations are labelled
* All axes are labelled, including with appropriate metric units
* Clear and appropriate use of visualisations (large enough size, data can be read clearly without reference to the raw data, and there are not too many visualisations presented at once)
* All visualisations are clearly explained and discussed prior to their placement in the report
* A range of different types of visualisations are used to provide more interesting and innovative ways of presenting the results

Data quality:

* Any limitations in the research approach need to be clearly stated and justified
* Further research should be stated to build upon the limitations that cannot be addressed in the research
* Where the findings are stronger and more robust and where they are not needs to be stated clearly
* They must use appropriate and consistent metric units

All numerical units should include an analysis of uncertainty / error margin and a statement on the method used to conduct the uncertainty analysis