

Memorandum of information

Name organization	TNO
Name tender	H2 supply system
Reference	2020 FPL/INK170
Tender address	https://www.tenderned.nl/tenderned-tap/aankondigingen/211057
Name contact person	Paul Springer
Date	30 november 2020

Question 1	
From our understanding you are looking at a containerized solution? Is this our correct understanding and would the approach look good?	
Answer 1	
The electrolysis system shall be containerized. It will be placed indoors. The storage part of the H ₂ supply system is open (skid vs container vs supported vessel). The best solution to be provided by the supplier. The H ₂ storage will be installed indoors or outdoors depending on the safety assessment performed during the project.	

Question 2	
Please indicate the available budget for the requested scope of the project.	
Answer 2	
Sufficient budget in line with the scope is available for the execution of the project but this amount will not be communicated in the tender process.	

Question 3	
Fig. 1 on page 29: What do the dotted lines mean for water conditioning and H ₂ conditioning?	
Answer 3	
There is no meaning to the dotted line comparing to the continuous lines in the Fig.1 (all the lines should have been continuous). The aim was to indicate the units which are foreseen to be part of the H ₂ supply system. The Fig. 1 is a very high level illustration. The chosen supplier is requested to prepare the process flow diagram as part of the project.	

Question 4	
Req. 8.11: Are there any requirements involving specific impurities in the H ₂ (e.g. dew point or O ₂ content), or can the 99,9% purity be considered in general?	
Answer 4	
99.9% H ₂ purity is considered to be sufficient. The dew point should remain below -20 °C.	

Question 5	
Req. 8.12: The delivery pressure should be 75 +/- 5 bar(a). On page 29 the specified delivery pressure is 70 bar(a). Please clarify.	
Answer 5	

The required delivery pressure is 75+/-5 bar(a) with the minimum delivery pressure being 70 bar(a).

Question 6	
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Req. 8.14: Where should the H ₂ flow measurement be positioned? i.e. after storage, before storage, at both outlets (from req. 8.15) or else?
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Answer 6	
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Part of the control system of the H ₂ supply system we expect a flow measurement to be positioned before the storage (to be determined during the design phase of the project). We agree with you that 8.14. is slightly confusing. The H ₂ supply system will be connected to a conversion unit. The conversion unit will control the flow of H ₂ towards the conversion unit. This means that a flow control is not required to be installed after the storage as part of this tender. A flow measurement can be installed temporarily for the FAT in order to validate the design.
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Regarding 8.15. the requirements refers to 2 H ₂ connections. This means that 2 pipes with a flange needs to be included (for example, if in the future, we would like to run 2 conversion units in parallel).

Question 7	
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Req. 8.16: The buffer should be sufficiently large such that 20 Nm ³ /h of H ₂ can be delivered at 70 bar(a) for 3 hours. This anticipates a higher compressor outlet pressure is required. Is our understanding correct?

Answer 7	
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The chosen supplier is requested to propose a solution as part of design. The chosen supplier can provide storage at higher pressure (compression before the storage) or can choose to store at lower pressure and install a compressor after the storage to match the required inlet H ₂ pressure for the conversion unit. The requirement is to provide H ₂ at 70 bar (a) for 3 hours at a 20 Nm ³ /h flow.
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Question 8	
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Req. 8.18: Will the H ₂ supply system be placed inside or outside? For which ambient temperature range should it be suitable?
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Answer 8	
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The electrolysis system will be placed indoors. The location can guarantee an ambient temperature above 5 °C. The storage as part of the H ₂ supply system will be placed indoors or outdoors, depending on the safety assessment.

Question 9	
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Req. 8.30: How many operational hours are expected per year?
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Answer 9	
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See requirement 8.30. H ₂ supply system SHALL be designed for a minimal mechanical lifetime of 10,000 operational hours.

The system shall be able to operate 4000 hours in a year.

What is the background of your question? We would like to understand what is your concern if there is any.
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Question 10	
Req. 8.56: A delivery period of max. 18 months is specified, but in section 1.3.1 a contract period of 2 years is mentioned. Please clarify.	
Answer 10	
The delivery time of the system is correct as specified in requirement 8.56. "The Contract is entered into for a period of 2 year(s). The proposed date of commencement is Q1 of 2021. The Contract will therefore expire on Q1 2023. Before this time the project has to be finished. No period of notice is required on either side. Options TNO is entitled – but not obliged – to extend the duration of the Contract under the same terms and conditions by 2 periods of each one years, commencing Q1 2023 and thereafter Q1 2024. TNO is to give notice of its intention to exercise this option no later than three months prior to the due expiry date of the Contract (including any prior extensions)." We believe the information is not contradictory. In the last months we may need to settle on the documentation, reports, invoices and so forth.	

Question 11	
Req. 8.62: Please clarify the requested scope for civil design	
Answer 11	
The civil design refers to skid frame design or any possible supports for H₂ storage. It includes data on stress and load calculations for the frame and equipment. Calculations on the weight to check if the floor can support. In addition we will use cranes and transport by trucks and we need to know the civil and load data.	

Question 12	
Pref. 8.6.1: Are these the only technical preferences applicable? I.e. is the contractor free to select components makes and brands, materials and equipment types based on their experience?	
Answer 12	
The selection of the aforementioned points is up to the contractor based on their experience and judgement.	

Question 13	
Appendix A04: Optional price is requested for Electrolyser system including BoP. Please clarify how this shall be interpreted.	
Answer 13	
The request for the optional price was to provide the estimate for the electrolysis system without including the storage. In this scenario the H₂ purity is still 99.9% and the volumetric flow 20 Nm³/h. This is for TNO to understand the main cost factors and to differentiate between the H₂ production system and the H₂ storage system.	

Question 14	
Reference is made to Appendix C03 - Article 11.1 and 11.2. Is the requested project scope regarded as a 'Performance' or as a 'Work'?	
Answer 14	
As a performance, this is mainly related to (technical) parts of the unit.	

Question 15	
Reference is made to Appendix C03 - Article 11 (Guarantee). Defects due to improper use, accidents not attributable to shortcomings of Supplier/Contractor, lack of proper maintenance or fitting, assembly, alterations or repairs by TNO or by third parties are not covered under warranty. The TNO conditions do not mention this. Are we allowed to add this condition?	
Answer 15	
The supplier must deliver a unit which works well. The components should perform as specified. This excludes situations where TNO is the cause of damage and/ or defects.	

Question 16	
Reference is made to Appendix C03 - Article 11 (Guarantee). This is an experimental process installation. Therefore guarantee is limited to technical guarantee. Please confirm acceptance.	
Answer 16	
This is not an experimental process. Guarantee needs to be provided for the complete system as build based on the requirements. This excludes situations where TNO is the cause of damage and/ or defects.	

Question 17	
Reference is made to Appendix C03 - Article 11.5. This article states 'In case of repaired or replacement performances, a guarantee period of twenty-four months again starts from the Delivery or the commissioning of the replacement or repaired Performance'. Please confirm that this will only refer to the replaced or repaired parts and not to the entire system.	
Answer 17	
This will refer to the replaced/repaired parts. The unit should work as agreed after installation of replacements/ repaired parts It included all connections.	

Question 18	
Reference is made to Appendix C03 - Article 11.5. This article states 'TNO is entitled to have the necessary measures carried out at your expense'. The wording 'at your expense' should be deleted. Please confirm your acceptance.	
Answer 18	
The contractor has to solve the problem. If contractor does not solve the problem then TNO will find other ways to solve the problem at the expense of the contractor.	

Question 19	
Reference is made to Appendix C03 - Article 15.6. This article includes consequential damage. We can not and will not accept being liable for consequential damage. We suggest deleting this article. Please confirm your acceptance.	
Answer 19	
Contractor is liable to restricted and limited consequential damage.	

Question 20	
Reference is made to Appendix C03 - Article 18.2. Every invoice should be paid in full. Invoices can't be settled against one other. Please confirm acceptance.	
Answer 20	
The sentence: "TNO is it all times entitled to reduce or set off its payment obligation to you against TNO's claims on you.", will be deleted. We will separate both obligations and claims in separate cases and will not settle them against each other.	

Question 21	
Reference is made to Appendix C03 - Article 19. This article includes consequential damage. We can not and will not accept being liable for consequential damage. Please confirm we may add a sub article stating that we will not be liable for consequential damage.	
Answer 21	
Could you specify which section you are referring to?	

Question 22	
Reference is made to Appendix C03 - Article 24.5. Please confirm that this article, like article 24.4, only refers to cases mentioned in article 24.1 a - e. Please confirm that in all other cases of partial termination the same applies as in article 24.3.	
Answer 22	
Partial termination can also happen when the contractor is not delivering the 'agreed results' according to the signed contract.	

Question 23	
Reference is made to Appendix C03 - Article 37. Please confirm that making copies of 'standard' software is only allowed in case this is allowed by the software supplier. Please note and accept that in many cases the number of copies/licenses is restricted and cannot be influenced by Tenderer. The application software can be copied.	
Answer 23	
Contractor should deliver a fixed and restricted amount of licenses available. Making copies of software should be allowed in case this is allowed by the software supplier.	

Question 24	
Reference is made to Appendix C03 - Article 39.3. Tenderer is entitled charging reasonable cost for making available replacement software copies. Please confirm acceptance.	
Answer 24	
Contractor can make reasonable cost for making available replacement software copies.	

Question 25	
Appendix C04 is missing on Tendered. Please provide.	
Answer 25	
Will be uploaded.	