

## I. IDENTIFICATION DATA

<b>Title:</b>	<b>Decentralised hydrogen production technology</b>
<b>Author:</b>	<b>Venkat Subramani Subbiah</b>
<b>Type of thesis:</b>	Master
<b>Faculty/department:</b>	Faculty of Mechanical Engineering
<b>Department:</b>	Department of Process Engineering
<b>Supervisor:</b>	Assoc. prof. Ing. Lukáš Krátký, Ph.D.
<b>Supervisor's place of employment:</b>	FME CTU in Prague, Department of Process Engineering

## II. EVALUATION CRITERIONS

<b>Diploma thesis assignment</b>	<b>Average</b>
<i>Difficulty evaluation of the diploma thesis assignment.</i>	
The main aim of the thesis was to prepare a rough techno-economic study of decentralised hydrogen production technologies, i.e. to design PFD chart, to perform an economic study of investment and productions costs, and payback. This topic was, therefore, a typical job for mechanical engineering, so its difficulty was average.	

<b>Fulfilment of the thesis's assignment</b>	<b>Fulfilled with great reservations</b>
<i>Evaluate whether the proposed final work fulfils the assignment. Comment where appropriate, points of reference that were not fully met, or if the work is extended compared to the assignment. If the assignment is also not wholly fulfilled, try to assess the importance, impact and possibly cause various deficiencies.</i>	
The main tasks of this thesis were (i) to prepare an overview of hydrogen production technologies (methods of H2 production, process set up, technical maturity), (ii) to perform a rough techno-economic study, i.e. design PFD scheme, do mass and energy balances and prepare an economic analysis of the technology, and (iii) to discuss their potential using sensitivity analysis. The review is very poor and much more detailed explanation of process set-up in the practical part is missing. The tasks of the thesis were fulfilled with significant reservations.	

<b>Activity and independence during the thesis's processing</b>	<b>E – sufficient</b>
<i>Evaluate whether the student was active during thesis's processing, whether he respected specific deadlines, if his solution was continuously consulted and whether he was sufficiently prepared for consultations. Consider the student's ability to work independently and creatively.</i>	
The author's approach was not so active. As the consultancy was managed, he very often did not come, or he went with no progress in the work. Demanded work was very often not ready for consultancy. Results were shown without any technical background both in a professional set-up and in-process parameters. There was plenty of demand given by the supervisor to clarify PFDs, process parameters, economics, etc.	

<b>Professional level</b>	<b>D – satisfactory</b>
<i>Assess the expertise level of the thesis, using the knowledge gained from the study of scientific literature, documentation and utilisation of data obtained from the practice.</i>	
The professional level fully reflects his activity during the thesis's processing. Plenty of formulations are not clear, not explained. The review is very poor, and no final statements and knowledge gaps are missing as demanded by the supervisor. As for the practical part, PFD design does not correspond with industrial standards, in-depth information and references about process set-up are missing, CAPEX evaluation is unclear.	

<b>Formal and language level</b>	<b>C – good</b>
<i>Assess formal correctness in the bibliography, the typographical and linguistic aspects of the thesis.</i>	
The thesis contains all the necessary formal requirements. Nevertheless, grammar correction is needed, format style must be checked, the numbering of the equation is missing, etc.	

**Bibliography****D – satisfactory**

*Comment the student's activity during the acquisition and use of learning materials to solve the thesis. Characterise the selection of sources. Assess whether the student made use of all relevant sources. Verify that adopted information is correctly distinguished from student's results and considerations, whether citation forms correspond with ethics, whether bibliographic citations are complete and finally whether all quote is following the practices and standards.*

The author used 33 references in the text. Citations in the manuscript and their format listed in the bibliography are following the European Copyright Act No. 121/2000 and even with all the citation practices. Nevertheless, the majority of references are just popular ones. Literature with a deeper description of the solved problematics was not used. Sometimes it is not clear if the text is a paraphrase or direct extract from the literature source.

**Other comments**

*Comment the level achieved significant results of the final work, e.g. the level of theoretical results, or the functional level of technical solutions, publication outlets, experimental skills, etc.*

No comments

**III. FINAL EVALUATION AND PROPOSAL OF CLASSIFICATION**

*Summarise aspects of the thesis that most influenced your final evaluation.*

Mr Subbiah submitted the thesis concentrating on the problematic of decentralised hydrogen production technologies as an operating set for CCU technology. The topic itself needed multidiscipline knowledge of process engineering skills, and therefore, it could be harder to elaborate it for him. The author's approach was not so active. Demanded work was very often not ready for consultancy. Results were shown without any technical background both in technical set-up and in process parameters. There was plenty of demand given by the supervisor to clarify PFDs, process parameters, economics, etc. So the practical part was prepared without deep characteristics and data from review. Plenty of formulations are not clear, not explained. As for the practical part, PFD design does not correspond with industrial standards, in-depth information and references about process set-up are missing, CAPEX evaluation is unclear. The majority of the references are just popular ones. Literature with a deeper description of the solved problematics was not used; the majority of references are just popular ones.

Based on its quality and student's level during the preparation of the thesis, I undersigned Lukas Kratky, I evaluate it as the supervisor by the grade

**D – satisfactory.**

Date: 13.8.2019

Signature: assoc. prof. Ing. Lukáš Krátký, Ph.D.