FEASIBILITY STUDY OF ADOPTING AN AVAILABLE STANDARD AS A NATIONAL STANDARD FOR THE MANUFACTURE OF BOILERS IN SRI LANKA

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Thesis submitted in partial fulfillment of the requirements for the degree
Master of Engineering

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November 2018

DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or institute of higher learning to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

As a result of several boiler explosions took place in the recent past that have been broadly discussed in Chapter 1 of this thesis, a need of a standard for the manufacture of boilers in Sri Lanka was arisen. Even though such codes have already been formulated, those are not practicable. Mainly the materials proposed for the shell are very rarely found in the local market. Therefore, in this research project, minimum and essential requirements for the manufacture of boilers and applicability of both specified materials and alternatively proposed materials which affect the construction of boilers were analysed. The main objective of the project was to carry out a feasibility study for adopting an existing standard as national standard. Within the identified scope the objectives of the research were to:

identify material requirements for the shell;

identify material requirements for the tube plates; and

identify material requirements for the man hole and hand hole.

Data collection was through open discussion with the manufacturers and statistics of the Labour Department. As of the findings of Chapter **8**, for a given steam boiler, the material specified in the standard and the proposed equivalent martial A36 as well, can be used for the shell, tube plates and man/hand holes.In addition to that, to provide essential guidelines to boiler manufacturers as given in Boiler pressure part materials of Chapter **3** and Pressure vessel welding of Chapter**4** so that their manufacturing process is enhanced thereby, to streamline the boiler industry of the country with the national legislations thereby, to ensure a safer working environment for the operators thereby and to evaluate the standard requirements in comparison with the actual data of materials to be used for the above are the other objectives.

In furtherance to that, the adopted standard as such is going to be used as the base document of the law that will be enacted by the Department of Labour of Sri Lanka in order to regulate the boiler industry or manufacture of boilers in Sri Lanka. Since the standards are voluntary in nature, it is essential to make special provisions in order to get this enacted as a law which will be a part and parcel of the judicial system of the country while the same will enhance the boiler industry to be matured enough in order to be able to confront with the market challenges by avoiding technical barriers to trade (TBT). However, there are two main limitations in consideration of assistance to be derived from existing standards as, availability of specified materials in the Sri Lankan market and achieving the specified quality control and assurance of welding process. Keeping the above as constraints of this study and IBR as the standard identified, a material designated by ASTM as A 36 was identified for equivalence from the market. Studies can be extended up to manufacture of pressure vessels as future work.

Finally, this project will open another access for forward march of the country, to become a Newly Industrialized Country (NIC).

ACKNOWLEDGEMENT

Firstly, I would like to express my sincere gratitude to my advisors, Prof. K. K .C. K. Perera, Vice Chancellor, University of Moratuwa, Sri Lanka and Dr. Saliya Jayasekara, Senior Lecturer, Department of Mechanical Engineering, University of Moratuwa, Sri Lanka for the continuous support of my MEng research for their patience, motivation, and immense knowledge.

Besides my advisors, I would like to express my special gratitude to Dr. L N Senaweera, former Director General, Sri Lanka Standards Institution for facilitating me to do the M Eng. in energy sector. His insightful comments, encouragement and hard questions insisted me to widen my research from various perspectives.

My sincere thanks also goes to Eng. M A Justin, Managing Director, Professionalmet Consultancy (Pvt.) Ltd., Eng. Rohith Fernando, Commissioner of Labour (Industrial Safety). Labour Department of Sri Lanka and Eng. Madhawa Perera, consulting engineer who facilitated me in literature survey and data collection, for their support in those activities.

Without their precious support it would not be possible to conduct this research. Further, I would appreciate everybody, who helped me in numerous ways at different stages of the research which was of utmost importance in bringing out this effort a success.

Last but not the least, I take this opportunity to express my gratitude to my beloved wife and two children for bearing up enormous burden during the period of my post graduate studies.

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LIST OF ABBREVIATIONS

Abbreviation	Description
UTS	Ultimate Tensile Strength
AWS	American Welding Society
PWHT	Post Weld Heat Treatment
IACS	International Association of Classification Societies