Pressure Vessel Design Manual

PRESSURE VESSEL DESIGN MANUAL

Fourth Edition

Dennis R. Moss

Michael Basic

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Preface to the 4th Edition

When I started the Pressure Vessel Design Manual 35 years ago, I had no idea where it would lead. The first edition alone took 10 years to publish. It began when I first started working for a small vessel shop in Los Angeles in 1972. I could not believe how little information was available to engineers and designers in our industry at that time. I began collecting and researching everything I could get my hands on. As I collected more and more, I began writing procedures around various topics. After a while I had a pretty substantial collection and someone suggested that it might make a good book. However I was constantly revising them and didn't think any of them were complete enough to publish. After a while I began trying to perfect them so that they could be published. This is the point at which the effort changed from a hobby to a vocation. My goal was to provide as complete a collection of equations, data and procedures for the design of pressure vessels that I could assemble. I never thought of myself as an author in this regard... but only the editor. I was not developing equations or methods, but only collecting and collating them. The presentation of the materials was then, and still is, the focus of my efforts. As stated all along "The author makes no claim to originality, other than that of format."

My target audience was always the person in the shop who was ultimately responsible for the designs they manufactured. I have seen all my goals for the PVDM exceeded in every way possible. Through my work with Fluor, I have had the opportunity to travel to 40 countries and have visited 60 vessel shops. In the past 10 years, I have not visited a shop that was not using the PVDM. This has been my reward. This book is now, and always has been, dedicated to the end user. Thank you.

The PVDM is a "designers" manual foremost, and not an engineering textbook. The procedures are streamlined to provide a weight, size or thickness. For the most part, wherever possible, it avoids the derivation of equations or the theoretical background. I have always sought out the simplest and most direct solutions.

Today, computers have changed the way we do our work. For the most part, designers and engineers rely on computers to perform their tasks. Computers are an integral part of the work process. I have been pleased that many of the procedures and techniques of the PVDM have been used by the software makers in the development of their software. So the question is raised...do we really need a book on how to perform manual calculations? After all, aren't computers capable of, and aren't they doing most of the work? I would offer the following points as a reply to this question;

1. As a method to develop an initial design.
2. As a basis for computer programs.
3. As a means to check and/or verify computer programs.
4. As a means to provide background and traceability.
5. As a historical basis. How was the equipment designed in the past?
6. For a comparison between designs.

This book does not always provide the most optimum solution. For more sophisticated and complex designs, the work process that has evolved in our company is to first develop a design and then hand it over to our FEA or stress specialists to evaluate and refine. Often, we have to be out for quote before a complete analysis can be done. This requires that we develop a design that will work, can be built, and do it quickly. However, it may not be the most economical design.

This edition is completely new in a number of ways. First, we have added a new chapter on design of high pressure vessels. Bits and pieces of this material have been scattered around for many years, but never comprehensively collected into a single source. I can state that this is the most complete collection of this material on this subject ever published.

Second, the sheer volume and scope of this edition makes this the most comprehensive manual on the design of pressure vessels ever published.

Third and most important, we have added a co-author to take over the PVDM. Please allow me to introduce Mr. Michael M. Basic. This is the most important addition to the PVDM. It is my sincere desire that this effort continue and my involvement is irrelevant to this goal. Therefore it is essential that the torch be passed to the next generation.

If I have an interest in seeing this book continuing, then it must be done under the direction of a new, younger and very talented person.

Finally, I would like to offer my warmest, heartfelt thanks to all of you that have made comments, contributions, sent me literature, or encouraged me over the past 35 years. It is immensely rewarding to have watched the book evolve over the years. This book would not have been possible without you!

Dennis R. Moss