## **Preface**

The thought of writing this book came into our minds after discovering there are little resources that put together comprehensive and step-by-step procedures and techniques that are applied in the economic analysis of upstream oil/gas engineering projects. The subject addressed in this book is an important and indispensable topic in petroleum engineering, especially in the upstream sector which involves oilfield development and production planning. The core concept of this piece is not only meant for the petroleum sector but can also be extended to other sectors where a thorough economic evaluation is required to be carried out before any investment decision on a potential project commitment.

Engineering Economy in Upstream Oil/Gas Field Development is a book that is selectively designed to serve the purpose of a teaching and learning material for courses in petroleum economics, energy finance, economic analysis, and little insight into project management. The book gives an account of all the scenarios and activities surrounding the business of oil and gas exploration and production in a given oil producing market. The chapters are presented in a sequential order that dictates the chronological stages involved between the national oil companies (NOCs) *i.e.* the host governments and the international oil companies (IOCs) during the process of license acquisition, exploration, and development of a leased oil block, in addition to project management and risk analysis. The synopsis of the methods, techniques, and theories covered in each of the chapters will also be discussed.

Chapter 1 explains the legal proceedings followed by operators (*i.e.* IOCs) in oil-producing countries (*i.e.* Host governments) for the purpose of being awarded the exploration license of several acreage of oil blocks. This acquisition of rights comes in different terms depending upon the fiscal regime of the host government. Procedures to be followed in the event of oil discovery are also discussed in this chapter.

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Chapter 2 discusses the techniques and methods employed by exploration companies when searching for the black gold and the volumetric estimation of the recoverable quantities of oil (Reserves) in the event of a potential discovery of hydrocarbon deposits.

Chapter 3 focuses on the positive outcome of oil exploration by providing technical details and other considerations put forward by prospective investors (Operating companies or IOCs) during planning and development phases of the discovered field, as the aim of the authors is to draw attention of readers to the stage by stage processes involved in the exploration and exploitation of petroleum resources by IOCs.

Chapter 4 details the application of economic tools in evaluating the profitability and feasibility of a proposed project with a contextual analysis of an upstream field development case study.

Chapter 5 dwells on whether there is any satisfactory outcome of the economic analysis performed on the proposed project which serves as an important input and valuable data that guide decision-makers in approving or disapproving the execution of the intended project for or against the interest of the company and its shareholders. It further discusses the concept of project ranking when comparing alternative investments that are independent, which helps investors to make a decisive choice in their project selection.

Chapter 6 introduces slightly, the elements of project management as it relates to upstream field development projects with the view to enlighten the students on the multidimensional course of project management.

Our objectives in producing this piece are to inculcate in the minds of our readers the ability and skills they would need in order to effectively conduct economic analysis and interpretation of results for their upstream and other related oil/gas engineering projects. The successful application of the knowledge gained in this book will require a strong background of the computational environment such as Excel, Matlab, Mathcad software and other well-structured programming languages in the likes of Visual Basics, Fortran 90, and C/C++. We have endeavoured to provide sufficient theories, methods, and techniques to help both the instructors and students in advancing the teachings and learning of this subject, and we do hope that this book will achieve the purpose and intentions of its authorship.

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