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New International Standards for Offshore Pipelines

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ABSTRACT

The paper addresses the ISO/DIS 13623 pipeline standard for the petroleum and natural gas industries presently circulating as a Draft International Standard (DIS) for voting. An important step is taken by the international pipeline community through this initiative to establish a truly international pipeline standard. A historical outlook is given as an introduction to the subject emphasizing the important role played to date by the ANSI/ASME B 31.4 and B 31.8 codes. The scope as well as the safety philosophy, the applied design format and the level of detail of the draft ISO standard is addressed. The important design requirement for pressure containment and the related requirement for pressure testing of offshore pipelines are discussed in some detail and some comments are given. The further strength and stability requirements of the ISO/DIS standard are considered briefly.

This recently issued NORSOK/DNV 1996 Pipeline Rules for submarine pipelines is reviewed, emphasizing its relation to the ISO/DIS pipeline standard. Basic features such as its scope, the underlying safety philosophy, the derived design factors and the applied LRFD design format are pointed out. The associated DNV Design Guidelines or Recommended Practices on essential offshore pipeline design issues are also highlighted.

The paper concludes by expressing the view that the ISO pipeline standard, once finalised and implemented and practiced as stated in the DNV96 Rules, opens for a considerable progress for the entire offshore pipeline industry.

KEY WORDS: Pipeline standard, pipeline rules, pipeline codes, ISO/DIS 13623, DNV 1996, safety philosophy, design format.

INTRODUCTION

The development of pipeline standards started in the US in the 1930's with the issue of the first B 31 code. Pipelines at that time were exclusively onshore pipelines. Later updating has resulted in a separation into a number of codes, in particular B31.4 for transportation of hydrocarbon liquids and B31.8 for transportation of natural gas. Amendments to cover offshore pipelines have been developed and issued. The ASME B31.4 and B31.8 codes, together with the API 5L and the API 1104 specifications for line pipe and pipeline welding, respectively, have been used and referenced by the petroleum and natural gas industries world wide.

However, the development of significant hydrocarbon reserves in Europe and other parts of the world since the sixties lead to a diversity of pipeline standards and specifications on a national or company level. Many industrialised countries developed their own pipeline standards including the prevailing requirements of their experts and approving authorities, ref. 5. Thus significant differences in safety and technical requirements for pipelines developed between the various national codes. On company level a similar process took place. This resulted in an increasing volume of standards and specifications with differences in their requirements not always relevant for the final product.

In recognition of this situation, which existeded more or less throughout the whole offshore oil and gas industry, the Technical Committee 67 of ISO (ISO/TC 67) was reactivated with the objective to develop truly international standards for the petroleum and natural gas industries. A need also existed to establish industry standards for Europe as a follow-up of the Directives of the European Commission.

With the decrease in oil price in the mid eighties a growing awareness developed that the costs and lead times for developing new prospects had to be reduced. The specification practices in the industry at that time were indicated as one of the main driving factors for the cost increase. In parallel to the ISO work Norway decided to establish the NORSOK organisation with the objective to establish common offshore industry standards applicable. Similar initiatives were seen in other countries.

Statoil is strongly supporting the international standardisation work, basically because of the company's position as operator of the largest offshore gas transmission system in the world. Secondly, Statoil has clearly seen the consequences of differring pipeline