

Comments on Special Issue

The current activities in the offshore deep-water development are growing all over the world at an accelerated pace. The definition of deep water is advancing rapidly as these developments are moving into deeper waters. Structures, e.g., FPSOs, SPARs, TLPs, and advanced semisubmersible designs, are of special interest in these developments. These structures are placed in deeper waters than originally envisioned. This advancement of deep-water structures is creating a challenge to the designers and developers of these structures in developing design tools.

Selection of numerical and experimental tools for finding solutions to problems of interest to these deep-water offshore structures is a difficult task. It is important to determine how the combination of computational tools with experimental methods can play a role in design decisions. The application of CFD is an extensive and lengthy process. Model tests are expensive and simulation of experiments in facilities of limited depth offers a challenge to the experimenters. However, model testing often reveals physical phenomenon that helps the numerical tool development. Similarly, numerical results help experimental investigations in the sense that they help select experiments that are useful in the design process. Therefore, it is important that the experts from the two disciplines are brought together on discussions of advantages of the two methods and how one can compliment the other in a successful design of the deep-water offshore structures of today. Besides, many new concepts yet unproven in the field are still under development. The actual behavior of these structures in practice is unknown. Model testing, when adequately designed, may provide a means to anticipate and experience any unforeseen or overlooked behavior of these structures, which are unlike known systems.

During the OMAE 2001 Conference in Rio de Janeiro, a special session was held primarily made up of invitees on the above subject. The purpose of the session was to stimulate discussions on the present challenges in the hydrodynamic design of offshore structures. In particular, the state of the experimental versus numerical methods in deep-water offshore structure design was discussed. Six papers were presented at the session, three of which were numerical and one experimental method. Others included both numerical and experimental approaches. One paper provided the state of the art in the development of ship hydrodynamics.

Besides the presenters, several expert participants in the audience interactively offered discussions on the general subject of modeling. It was clearly identified that in today's deep-water structure development, the interaction of the theoreticians and experimenters is critically important for their success so that the development and operation of these structures are safe and affordable.

The papers were further reviewed for the journal and have gone through revisions based on the reviews. This special issue publishes these papers along with a few selected discussions based on the general subject on the theme of the special issue.

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