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Abstract

Stress analysis is a prerequisite of Engineering Critical Analysis (ECA) of pipeline girth welds in new constructions. Such analysis is required in pipe construction standards, such as API Standard 1104 Appendix A. However no specific procedures of stress analysis are usually prescribed in pipeline construction standards. Although the input stress for ECA is supposedly to include all stresses during the life time of the pipelines, the most significant stress is usually the stress imposed on the pipelines in the lowering-in process during construction. Various factors affecting the lowering-in stress were examined in this paper. Some of the dominant factors are the relative lift height of the pipe, cover depth, and the number of lift points. The number of lift points is related to the number of sidebooms used in construction and is determined by the diameter and wall thickness of the pipe (or pipe unit weight). The longitudinal stress is strongly affected by the number of sidebooms and the relative spacing and load distribution of the sidebooms. Practical considerations are given to the load capacity of the sidebooms and lift height variation in a pipeline construction project.

Keywords

Pipeline construction, Girth weld, ECA, Stress analysis, Sideboom, Lift capacity