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PRESSURE INDUCED FATIGUE

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FOREWORD

This document was developed under a research and development project which resulted from ASME Pressure Technology Codes & Standards (PTCS) committee requests to identify, prioritize and address technology gaps in current or new PTCS Codes, Standards and Guidelines. This project is one of several intended to establish and maintain the technical relevance of ASME codes & standards products. The specific project related to this document is project 07-06 (B31#3), entitled "Pressure Induced Fatigue."

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ABSTRACT

The purpose of this study is to begin the process of developing an appropriate and accurate method of predicting fatigue failure due to internal pressure loading in piping components. Historically, piping component fatigue has been analyzed using the approach of Markl [1]. The results from the cyclic pressure testing of 41 piping intersections have been evaluated. The fatigue results were found to follow the Markl type power law relationship with some considerable scatter. The scatter observed in the data is attributed to variation due to the nature of fatigue failure in large welded structures. It is further concluded that several design curves are appropriate for use as a design rule for pressure induced fatigue.