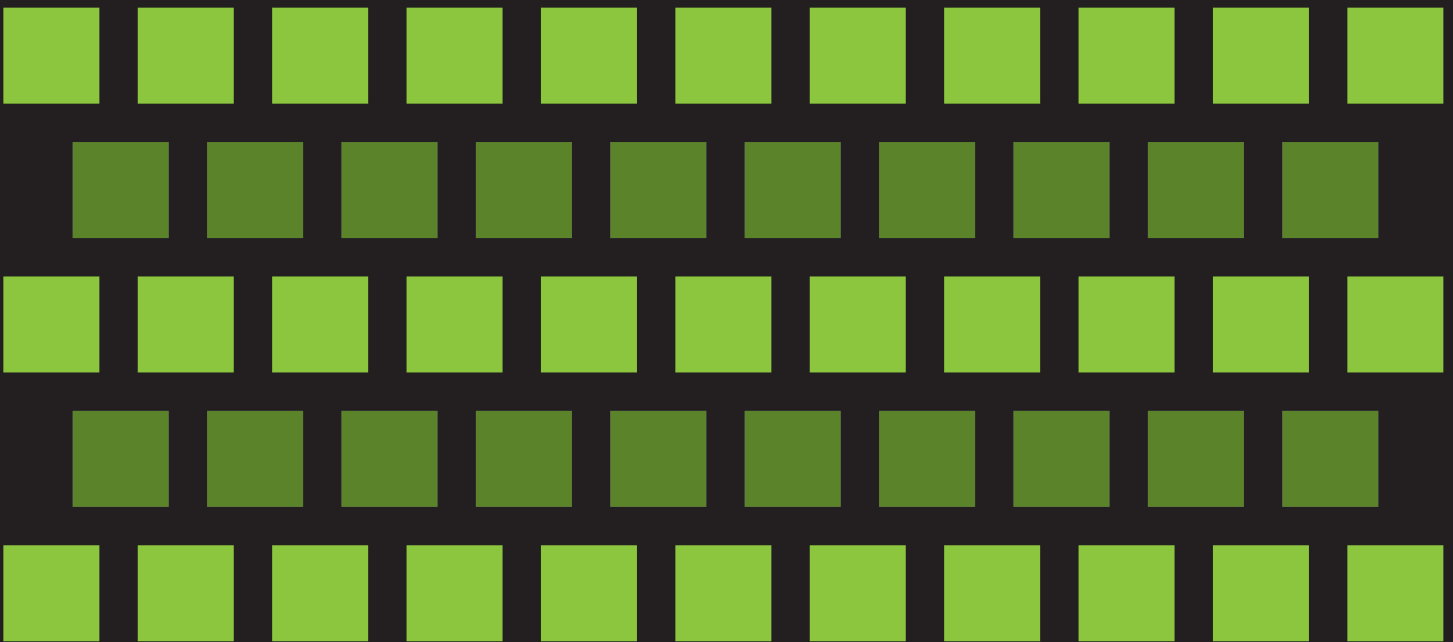


STP-PT-027

# EXTENDED LOW CHROME STEEL FATIGUE RULES



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## TABLE OF CONTENTS

Foreword .....	v
Abstract .....	vi
1 INTRODUCTION .....	1
2 MATERIALS.....	2
3 CREEP-FATIGUE DATA.....	4
4 CREEP-FATIGUE INTERACTION.....	5
5 A MODEL FOR CREEP-FATIGUE IN PRESSURE VESSEL APPLICATIONS.....	6
6 CREEP-FATIGUE DAMAGE AND EVALUATING $\beta$ .....	9
7 THE DESIGN CURVE.....	12
8 COMMENT ON MARGINS.....	14
9 PROPOSAL FOR TEST PROGRAM.....	16
References .....	21
Acknowledgments.....	22
Abbreviations and Acronyms.....	23

### LIST OF TABLES

Table 1 - Creep-fatigue Test Matrix (hours) .....	16
Table 2 - Creep-fatigue Test Matrix (cycles) .....	16

### LIST OF FIGURES

Figure 1 - The Effect of Tensile Strength on the $10^5$ Hour Stress Rupture Strength at 850°F for 2 ¼ Cr-1Mo-V Alloy. [3] .....	2
Figure 2 - Cyclic Softening and Hardening Behavior are Illustrated. High Strength Cr-Mo-V Alloys of Interest Here Display the Softening Behavior in the Upper Plot.....	3
Figure 3 - Assembled Creep-fatigue Data for Strain Softening Alloys Showing Similarity of Behavior. ....	4
Figure 4 - Creep-fatigue Interaction Diagram of Type Used by International Codes for the Strain Softening Alloy 91. ....	5
Figure 5 - Cyclic Straining in a Creep-fatigue Test Will Accelerate the Creep Strain Rate and Thereby Shorten Creep Life. ....	7
Figure 6 - Interaction Diagram Indicates Strong Creep- Fatigue Interaction for Endo’s Data Shown in Figure 3. ....	9
Figure 7 - Krempl’s Study of the Effect of Hold Time on High and Low Ductility Materials. ....	10
Figure 8 - Predictions of Hold Time Effects on Cyclic Life for 3 Plastic Strain Amplitudes. ....	11
Figure 9 - Total Life Increases With Fewer Cycles, i.e., Longer Hold Time. ....	11

Figure 10 - Fatigue Cycles Dependent on Creep Life With Comparison to No Hold Time Fatigue Tests. ....	12
Figure 11 - Comparison of Design Line and Experiments. ....	13
Figure 12 - Hold Time Creep-fatigue Data as Compared to Design Lines Indexed to Stress Rupture Life Absent Fatigue. Only the Very High Strain Results on Brittle Material Approach the Design Curves. ....	14
Figure 13 - Reduction in Life Associated With Increase in Pseudoelastically Calculated Stress Amplitude. ....	14
Figure 14 - Comparison of Life With and Without Fatigue Cycling for Various Pseudoelastically Calculated Stresses.....	15
Figure 15 - Comparison of Test Results (top) With Model Prediction (bottom) of Tertiary Creep Strain Accumulation With and Without Strain Cycling. With Strain Cycling, Tertiary Creep Strain Rises Rapidly as Compared to Constant Stress.....	18
Figure 16 - Comparison of Test Results (top) with Model Prediction (bottom) of Creep Rate Acceleration With Tertiary Creep Strain Accumulation. Test Results With and Without Strain Cycling Disclose Cyclic Strain Softening (top). With Strain Cycling, Tertiary Creep Rate Rises Rapidly as Compared to Constant Stress as Predicted by Model (bottom). ....	19
Figure 17 - Comparison of Test Results (top) With Model Prediction (bottom) of Total Strain Accumulation With Strain Cycling Plus Steady Load Creep for Indicated Cycles. With Strain Cycling, Strain Rises Rapidly as Compared to Constant Load, see Figure 15.....	20

## 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 included for ASME fiscal year 2008 sponsorship which are intended to establish and maintain the technical relevance of ASME codes & standards products. The specific project related to this document is project 07-04 (BPVC#2), entitled, “Extend Low Chrome Steel Fatigue Rules.”

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**ABSTRACT**

In this report material models were examined for hardening/softening and creep behavior based on available material data sources. Creep and multi-axial effects will be considered. Analytical studies will be explored for typical components using these models. Based on the results, recommendations for an approach to develop fatigue design rules and suitable design factors will be made. Investigation should include consideration of 1-1/4, 2-1/4 and 9 to 12 Cr alloys.

A recommendation was made for developing a technical program for extending the current ASME Section VIII fatigue rules to higher temperatures to address fatigue design aspects for components operating at temperatures approaching the creep range. Vessels where this is commonplace occur in the refining industry; therefore, this development work is of high interest to the petrochemical industry.