

VOLUME II

TABLE OF CONTENTS

	<u>Page</u>
LIST OF SYMBOLS SECTION 3	xi
XXI. INTRODUCTION	149
XXII. SUMMARY OF VOLUME II	151
SECTION 3	
ANALYSIS OF SEVERAL HIGH-PRESSURE CONTAINER DESIGN CONCEPTS	
XXIII. SUMMARY FOR SECTION 3	153
XXIV. SCOPE OF ANALYSIS	156
XXV. BASIS AND METHOD OF ANALYSIS	161
XXVI. METHOD OF PARAMETER NOTATION	162
XXVII. FATIGUE CRITERIA	163
Fatigue Criterion for Ductile Outer Cylinders	163
Fatigue Criterion for High-Strength Liner	164
XXVIII. ELASTICITY SOLUTIONS	169
Elasticity Solutions for a Cylinder	169
Elasticity Solutions for Segmented Components	169
Ring Segment	170
Pin Segment	171
XXIX. NONDIMENSIONAL PARAMETER ANALYSIS	173
Multiring Container	173
Static Shear Strength Analysis	173
Fatigue Shear Strength Analysis	175
High-Strength Liner Analysis	176
Ring-Segment Container	182
Ring-Fluid-Segment Container	184
Pin-Segment Container	189
Strip-Wound Container	194
Controlled Fluid-Fill, Multiring Container	194
XXX. ANALYSIS OF RING FLUID RING CONTAINERS FOR HIGH PRESSURE	197
Generalized Fatigue Criteria	197

TABLE OF CONTENTS
(Continued)

	<u>Page</u>
General Analysis of Multiring Containers	200
Shear-Strength Analysis of a Multiring Container	201
Comparison of the Shear and Tensile-Fatigue Criteria	202
Example Designs of Containers	204
Example Design 1	204
Example Design 2	206
Conclusions and Recommendations	207
 XXXI. DESIGN REQUIREMENTS AND LIMITATIONS FOR HIGH-PRESSURE CONTAINERS	 208
Possible Manufacturing and Assembling Limitations	208
Residual Stress Limitations	211
Other Possible Material Limitations	215
SECTION 4	
HYDROSTATIC EXTRUSION CONTAINERS DESIGNED AND CONSTRUCTED IN THE PROGRAM	
 XXXII. SUMMARY OF SECTION 4	 217
 XXXIII. ANALYSIS OF THREE CONTAINERS DESIGN	 218
Container I	218
Selection of Failure Criterion	218
Stress Analysis of Container Assembly	221
Operational Capabilities Predicted by Theory	225
Container II	229
Revised Container-Assembly Design	229
Stress Analysis	231
Component Ring Materials	235
Operational Capabilities	235
Container III	236
The Design of Container III	236
Container Assembly	238
 APPENDIX I. ELASTICITY SOLUTION FOR A RING SEGMENT	 240
ELASTICITY SOLUTION FOR A PIN SEGMENT	242
SOLUTION FOR SHEAR STRESSES IN PINS	248
 APPENDIX II. DERIVATIONS OF FORMULAS FOR ASSEMBLY INTERFERENCES	 253
 APPENDIX III. COMPUTER PROGRAMS	 255
 REFERENCES FOR VOLUME II	 256