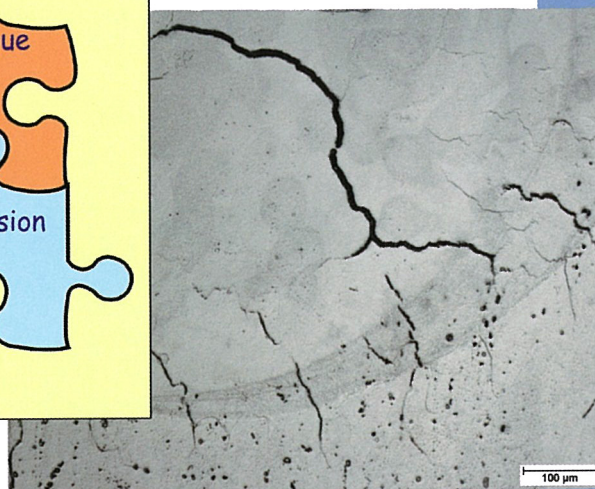
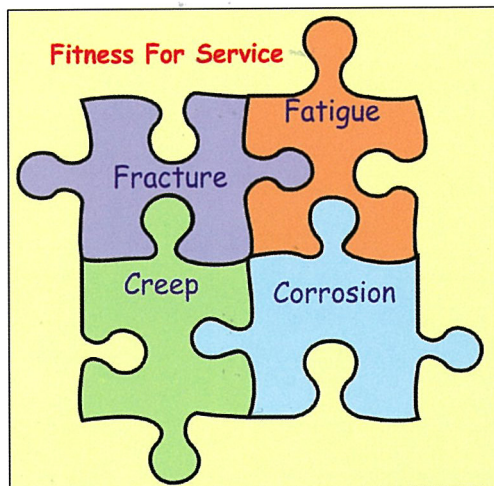




International Conference on Fitness-for-Service

FITNET 2006

FRACTURE – FATIGUE – CREEP – CORROSION

17 - 19 May 2006

SHELL Global Solutions

Amsterdam, The Netherlands

Editor:
M. Koçak

PROCEEDINGS
CONFERENCE

CONTENTS

Preface

Chapter I	FITNET Overviews	1
------------------	-------------------------	----------

FITNET 06-04		
FITNET Fitness for Service Procedure: An Overview		3
<i>M Koçak, GKSS Research Centre, Germany</i>		

FITNET 06-05		
The Fracture Module of the FITNET FFS Procedure		15
<i>S Webster, Y. Tkach, CORUS RD&T, UK</i>		

FITNET 06-06		
The Fatigue Module of the FITNET FFS Procedure		23
<i>JJ Janosch, Caterpillar, France, N Taylor, Joint Research Centre, The Netherlands, M Huther, Bureau Veritas, France, S Maddox, TWI, UK, M Koçak, GKSS Research Centre, Germany, HP Lieurade, CETIM, France.</i>		

FITNET 06-07		
An Overview of the Creep Module of the FITNET FFS Procedure		31
<i>RA Ainsworth, British Energy Generation Ltd, UK, G-L Cosso, IIS, ITALY, B Dogan, GKSS Research Center, Germany, S Holdsworth, EMPA, Switzerland, J Korous, BISAFE, Czech Republic, I Marcelles, Tecnatom, Spain, F Mueller, TU Darmstadt, Germany.</i>		

Chapter II	Features of the International FFS Procedures	41
-------------------	---	-----------

FITNET 06-01		
Recent Developments and Improvements in API 579		43
<i>D Osage, Equity Engineering Group, M. Prager, MPC and PVRC, USA</i>		

FITNET 06-02		
Current Status of Fitness-for-Service Rules in Japan		55
<i>K Hasegawa, HITACHI Ltd., H. Kobayashi, Yokohama National University, Japan</i>		

FITNET 06-03		
Recent Works on Developing Structural Acceptance Criteria for Local Wall Thinning of Nuclear Pipings within Korea and Japan		65
<i>Y-J Kim, Korea University, Korea, Ch-Y Park, S-H Lee KEPRI, Korea, J-H Park Chunbuk National University, Korea, J-W. Kim, Chosun University, Korea, K Hasegawa, HITACHI Ltd., Japan</i>		

CONTENTS

FITNET 06-020		
Limit Loads for Circumferential Cracked Pipe Bends under In-Plane Bending		
<i>Y-J Kim, C-S Oh, Y-I Kim, Korea University, Korea, C-Y Park, KEPRI, Korea</i>	75	
FITNET 06-033		
Method of Constraint Loss Correction of CTOD Fracture Toughness for Fracture Assessment of Steel Components		
<i>F Minami, M Ohata, Osaka University, Japan, H Shimanuki, Nippon Steel Corporation, Japan, T Handa, S Igi, M Kurihara, JFE Steel Corporation, Japan, T Kawabata, Sumitomo Metal Industries, Japan, Y Yamashita, Ishikawajima-Harima Heavy Industries, Japan, T Tagawa, Nagoya University, Japan, Y Hagihara, Sophia University, Japan</i>	85	
FITNET 06-035		
A Strain-Based Approach to Fracture Assessment of Pipelines	95	
<i>E Østby, SINTEF Materials and Chemistry, Norway, E Torselletti, Snamprogetti, Italy, E Levold, Statoil ASA, Norway</i>		
FITNET 06-036		
The Criticality of ECA on Girth Welds of Offshore Pipelines	105	
<i>R Bruschi, E Torselletti, F Marchesani, L Bartolini, L Vitali, Snamprogetti S.p.A., Italy</i>		
FITNET 06-029		
Fatigue and Reliability in Automotive Design	117	
<i>HP Lieurade, CETIM, France, JJ Thomas, PSA Peugeot-Citroen, France, A Bignonnet, ab consulting, France</i>		
Chapter III	Features of the FITNET FFS Procedure	125
FITNET 06-09		
The Treatment of Constraint in the FITNET FFS Procedure	127	
<i>S Cicero, University of Cantabria, Spain, RA Ainsworth, British Energy Generation Ltd., UK, Y Tkach, CORUS RD&T, UK</i>		
FITNET 06-011		
Best Practice Fracture Toughness Estimates Based on the Charpy-V Impact Test	135	
<i>K Wallin, P Nevasmaa, A Laukkanen, VTT Materials Performance, Finland</i>		

CONTENTS

FITNET 06-012		
Loading Rate Effects on the Fracture Toughness of Steels		
<i>E Lucon, SCK•CEN, Belgium, I Rokach, Kielce University, Poland</i>		143
FITNET 06-023		
Flaw Interaction Rules in FITNET FFS Procedure		149
<i>W De Waele, Ghent University, Belgium, K Hasegawa, HITACHI Ltd., Japan, R Denys, A Lefevre Ghent University, Belgium,</i>		
FITNET 06-013		
Treatments of Structural Welds Using FITNET Fitness For Service Assessment Procedure		155
<i>M Koçak, GKSS Research Centre, Germany, E Seib, Continental AG, Germany, A Motarjemi, TWI Ltd., UK</i>		
FITNET 06-034		
A FITNET Procedure for FFS-Based Fatigue Evaluation using the Master S-N Curve Approach		169
<i>P Dong, BATELLE, USA</i>		
FITNET 06-022		
Compilation of Stress Intensity Factor and Limit Load Solutions for the FITNET Procedure		179
<i>I Hadley, TWI Ltd., UK and S Szavai, Bay Zoltan Foundation, Hungary</i>		
FITNET 06-024		
The Education and Training Content of FITNET		187
<i>S Cicero, FG Solana, JA Alvarez University of Cantabria, Spain</i>		
Chapter IV	Case Studies and Validations	193
FITNET 06-031		
Compilation of Case Studies in FITNET FFS Procedure		195
<i>A Laukkanen, P Nevasmaa, K Wallin, VTT Materials Performance, Finland</i>		
FITNET 06-014		
Case Studies for Fatigue Module of FITNET FFS Procedure		203
<i>M Huther, Bureau Veritas, France, M Vormwald, TU Darmstadt, Germany</i>		

CONTENTS

FITNET 06-025	
Fatigue Strength Improvement Methods for Welded Details	211
<i>P Haagensen, Norwegian University of Science and Technology, Norway</i>	
FITNET 06-018	
Validation of Fracture Assessment Procedures Through Full-Scale Testing	221
<i>I Hadley and P Moore, TWI Ltd., UK</i>	
FITNET 06-019	
Fracture Analysis of Thin-Walled Laser Beam and Friction Stir Welded Al-alloys using FITNET FFS Procedure	229
<i>E Seib, Continental AG, Germany, M Koçak, V Uz, GKSS Research Centre, Germany</i>	
FITNET 06-032	
Validation of the FITNET Analysis Procedures for the Assessment of ARIANE 5 Thin-Walled Components	241
<i>I Varfolomeyev, L Hodulak, D Siegele, Fraunhofer IWM, Germany, M Windisch, MT Aerospace, Germany</i>	
FITNET 06-038	
Assessment of Tubes for Manufacturing of Hydraulic Cylinders Using FITNET FFS Procedure	249
<i>S Beretta, Politecnico di Milano, Italy, H Desimone, TENARIS Dalmine, Italy, H Ernst, TENARIS Siderca, Italy, M Cristea, Politecnico di Milano, Italy</i>	
FITNET 06-027	
Assessment of Creep-Fatigue Crack Growth	257
<i>SR Holdsworth, EMPA, Switzerland, RA Ainsworth, British Energy Generation Ltd., UK</i>	
FITNET 06-026	
Application of the FITNET FFS Procedure Creep Module for the Assessment of a Pressure Vessel	265
<i>G Canale, GL Cosso, Istituto Italiano della Saldatura, Italy</i>	
FITNET 06-010	271
Sources of Scatter in Creep/Fatigue Growth Testing and the Impact on Plant Assessments	
<i>B Dogan, U Ceyhan GKSS Research Centre, Germany, J Korous, BSAFE, Czech Republic, F Mueller, TU Darmstadt, Germany,</i>	

CONTENTS

RA Ainsworth, British Energy Generation Ltd, UK

FITNET 06-028

Assessment of Local Thinned Areas

281

D Ritchie R Koers, SHELL Global Solutions International B.V., The Netherlands.

FITNET 06-016

Application of FITNET Procedure for Failure Analysis of Medical Components

301

S Cicero, FG Solana, JA Alvarez, L Sanchez, University of Cantabria, Spain