Conference Program

Fracture Mechanics 2005

Symposium of

Multiscale Damage Related to Environment Assisted Cracking

November 2-5, 2005

Crowne Plaza Zhengzhou
Zhengzhou, Henan, China

Organizers

- Zhengzhou University, China
- East China University of Science and Technology, China
- National Technical Research Center on Safety Engineering of Pressure Vessels and Pipelines (NTRC-SEPVP), China
- Nanjing University of Technology, China
- Zhejiang University of Technology, China
- Zhejiang University, China

Sponsors

- Ministry of Science and Technology of China
- National Natural Science Foundation of China
- Chinese Mechanical Engineering Society
- Boiler and Pressure Vessel Safety Supervision Bureau, General Administration of Quality Supervision and Inspection and Quarantine of China
- Chinese Pressure Vessel Institution

FM 2005 General Program

Wednesday, November 2, 2005

12:00-19:00 Arrival and Registration at Crowne Plaza Zhengzhou, 115 Jinshui Road, Zhengzhou, Henan, China

18:00-20:00 Reception (Welcome)

Thursday, November 3, 2005

08:30 Opening Ceremony
Chairman: Qiwu Dong

08:30 **Welcome by President of Zhengzhou University**

08:40 **Address by Chairman of International Advisory Committee**
George C. Sih (Lehigh University, USA)

08:50 **Opening by Symposium Series Chairman**
Shan-Tung Tu (East China Univ. of Sci. & Tech. / Nanjing Univ. of Tech, China)

FM 2005 Technical Program

Morning Lectures, Thursday, November 3, 2005

Keynote Lecture
Chairman: Shan-Tung Tu

09:00 **Multiscale cracking aggravated by environment: effects of electron behavior on local chemistry** (p.1)
George C. Sih (ECUST, China/Lehigh University, USA)

09:40 **Scaling of thermal damage of cementitious materials** (p.13)
A. Menou (LCSR/CNRS/IUT, France)

10:20 Coffee break

10:40 **Fatigue life prediction of U-rib to crossbeam joints using strain energy density factor approach** (p.21)
Dong-Ho Choi (Hanyang University, Korea)

11:20 **Research on corrosion fatigue of tube-to-tubesheet weld foint** (p.29)
Qiwu Dong (Zhengzhou University, China)

12:00 Lunch

Afternoon Sessions, Thursday, November 3, 2005

Session 1A: Environment Assisted Cracking
Chairman: Jianming Gong

14:00 **Estimation of threshold value for stress corrosion cracking of typical steel for pressure vessel under wet H_2S environment** (p.37)
Xuedong Chen, Jialing Jiang, Tiecheng Yang, Jiushao Hu, Zhibin Ai

14:20 **J-integral method of FEM in calculation of SCC** (p.67)
Minshan Liu, Qiwu Dong, Jing Li

14:40 **Stress corrosion cracking tests of 20g steels in typical sulphur removing system** (p.123)
Zhiming Lu, Zengliang Gao, Deming Fang

Session 1B: Fracture & Damage Mechanics
Chairman: Jae-Kyoo Lim

14:00 **Combine emission of edge and screw dislocations from microcrack caused by residual stresses in and out-of the plane** (p.51)
Xuesong Tang, G.C. Sih

14:20 **Maximum energy difference theory for crack propagation** (p.91)
Songhua Tang, Yingshe Luo, Zhubao Zhou, Zhichao Wang

14:40 **Effect of micro-scale residual anti-plane stress on crack behavior in viscoelastic medium** (p.59)
Jianjun Chen, Shan-Tung Tu, Fu-Zhen Xuan, Zhengdong Wang

15:00 **Comparison of fatigue crack growth rates of 17-4PH, 1Cr13 and 2Cr13 in chloride environment** (p.113)
J. W. Hao, S. H. Tang, H. L. Pan

15:20 **Environment-corrosion failure of the stainless-steel corrugated pipe** (p.193)
Baiyang Lou, Renguo Song, Bin Xu

15:00 **Investigation on aging effect of plain woven glass fiber reinforced epoxy laminate in acidic conditions** (p.131)
Hu Ruihua, Do-Won Seo, Renliang Wang, Sang-Yong Lee, Jae-Kyoo Lim

15:20 **Electrochemical test of 304 stainless steel and fractal characteristic of pits distribution** (p.109)
Wei Zhang, Chenghao Liang, Zengliang Gao

15:40 Coffee break

Session 2A: Engineering approach
Chairman: G.C. Sih

16:00 **The fracture Performance of steel fiber reinforced concrete with grade two aggregate** (p.127)
Juhong Han, Danying Gao, Guozhu Shi, Zhanqiao Wang

16:20 **Processing and mechanical properties of porous 316L stainless steel for artificial hip joints** (p.43)
M.M. Dewidar, K.A. Khalil, M.K. Hassan, G. Tag, D.W. Seo, J.K. Lim

16:40 **Processing of high porosity Ti-6Al-4V by powder sintering process for biomedical applications** (p.177)
M.M. Dewidar, D.W. Seo, J.K. Lim

17:00 **Study on the plastic limit load of elbows with local thinned area under combined internal pressure and in-plane closing bending moment** (p.197)
Zhixiang Duan, Shiming Shen

17:20 **Investigation of temperature distributions and deformations for coke drums** (p.215)
Sunyi Chen, Zhengdong Wang

17:40 **Stress analysis of ceramic-lined steel pipe fabricated by centrifugal thermite process** (p.221)
Zhuoqun Qian, Hualin Wang, Yuqin Chen, Hongliang Pan

Session 2B: Tesiting and Simulation
Chairman: Zengliang Gao

16:00 **Experimental study on the assembled support structure with GFRP disc and 0Cr18Ni9 pipe for cryogenic vessels** (p.185)
Rongshun Wang, Guangze Dai, Qingqing Ni

16:20 **Impact simulation of CFRP-steel shell** (p.103)
Lixin Dong, Guangze Dai, Liling Liu, Qingqing Ni

16:40 **Finite element prediction of residual stresses and thermal distortion in brazed plate-fin structure** (p.145)
Hu Chen, Jianming Gong, Luyang Geng, Shan-Tung Tu

17:00 **Experimental studies on fatigue strength underwater of dissimilar steel weld joint for runner blade** (p.119)
Tong Liu, Minshan Liu, Qiwu Dong, Shilian Chen

17:20 **Rapid sintering of Al_2O_3-8YSZ bioceramic composites by high frequency induction heating** (p.137)
K.A. Khalil, M.M. Dewidar, Jung In Kyoon, Sug Won Kim

18:00 Banquet

Morning Sessions, Friday, November 4, 2005

Session 3A: Fatigue and Creep Damage
Chairman: Dong-Ho Choi

09:00 **Constitutive relation and evolution equation of power hardening material fatigue damage** (p.71)
Daoxiang Zhou, Peng Xu

09:20 **Time-dependent deformation in cracked SUS304 steel at room temperature and its effects on fatigue crack growth** (p.77)
Tao Mo, Defu Nie, Jie Zhao

09:40 **Fatigue-creep interaction behavior of 1.25Cr0.5Mo steel and condition free from creep invalidation analysis** (p.171)
Zhichao Fan, Xuedong Chen, Ling Chen, Jialing Jiang

10:00 **Stress relaxation testing for analysis of SA335-P91 steel creep behavior** (p.161)
Weiming Sun, Xin Ren, Kangda Zhang

10:20 **Creep stress calculation model for ethylene cracking furnace tube under consideration of carburization** (p.165)
Changyu Zhou, Tao Zhao

Session 3B: Industry Applications
Chairman: A. Menou

09:00 **Discussion about several issues in the practice of risk-based inspection (RBI)** (p.203)
Xuedong Chen, Tiecheng Yang, Zhibin Ai, Bing Wang, Wangping Gu

09:20 **An investigation of the failure of low pressure steam turbine blades** (p.229)
Weize Wang, Fu-Zhen Xuan, Kuilong Zhu, Shan-Tung Tu

09:40 **A new ultrasonic method to evaluate dislocation changes under fatigue damage process** (p.83)
Shihua Tang, S. Wu, H. L. Pan

10:00 **Creep fracture toughness of welded joint for 2.25Cr1Mo steel** (p.155)
Chunwei Ma, Fu-Zhen Xuan, Zhengdong Wang, Shan-Tung Tu

10:20 **Research on damages in ground advanced ceramics** (p.97)
Yumei Bao, Weina Hao, Guozhong Chai

10:40 Coffee break

11:00 Panel Discussion: Future Research and FM 2006
Chairman: Shan-Tung Tu

Panelists: A. Menou, Jae-Kyoo Lim, Dong-Ho Choi, G.C. Sih, P.N. Li, S.T. Tu, Q.W. Dong, X.D. Chen, Z.D. Wang, Z.L. Gao and J.M. Gong.

11:50 Closing

12:00 Lunch

13:00-18:00 Visiting

US-China Seminars, August 8-20, 2005

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