

**Proceedings of
ASME 2023 Pressure Vessels
& Piping Conference**

(PVP2023)

Volume 6

**July 16-21, 2023
Atlanta, Georgia**

Conference Sponsor
Pressure Vessels and Piping Division

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Two Park Avenue * New York, N.Y. 10016

© 2023, The American Society of Mechanical Engineers, 2 Park Avenue, New York, NY 10016, USA
(www.asme.org)

All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.

INFORMATION CONTAINED IN THIS WORK HAS BEEN OBTAINED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS FROM SOURCES BELIEVED TO BE RELIABLE. HOWEVER, NEITHER ASME NOR ITS AUTHORS OR EDITORS GUARANTEE THE ACCURACY OR COMPLETENESS OF ANY INFORMATION PUBLISHED IN THIS WORK. NEITHER ASME NOR ITS AUTHORS AND EDITORS SHALL BE RESPONSIBLE FOR ANY ERRORS, OMISSIONS, OR DAMAGES ARISING OUT OF THE USE OF THIS INFORMATION. THE WORK IS PUBLISHED WITH THE UNDERSTANDING THAT ASME AND ITS AUTHORS AND EDITORS ARE SUPPLYING INFORMATION BUT ARE NOT ATTEMPTING TO RENDER ENGINEERING OR OTHER PROFESSIONAL SERVICES. IF SUCH ENGINEERING OR PROFESSIONAL SERVICES ARE REQUIRED, THE ASSISTANCE OF AN APPROPRIATE PROFESSIONAL SHOULD BE SOUGHT.

ASME shall not be responsible for statements or opinions advanced in papers or . . . printed in its publications (B7.1.3). Statement from the Bylaws.

For authorization to photocopy material for internal or personal use under those circumstances not falling within the fair use provisions of the Copyright Act, contact the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, tel: 978-750-8400, www.copyright.com.

Requests for special permission or bulk reproduction should be addressed to the ASME Publishing Department, or submitted online at: <https://www.asme.org/publications-submissions/journals/information-for-authors/journalguidelines/rights-and-permissions>

ISBN: 978-0-7918-8749-3

TABLE OF CONTENTS

Ultrasonic Phased Array Detection of Crack-Like Defects in Welds Based on Multi-Mode Total Focusing Method..... <i>Yangguang Bu, Zhichao Fan, Xuedong Chen, Jingwei Cheng, Wei Chen, Zhe Wang, Haibin Wang</i>	1
Development of WES 2820 Fitness-for-Service Assessment Procedure - Metal Loss Assessment <i>Junya Takahashi, Atsushi Yamaguchi</i>	6
Numerical Investigation for an Optimized Procedure of Overlay Welding Repair for the Metal Loss of Large-Scale Structures <i>Junya Takahashi, Yuki Yamauchi, Masakazu Shibahara</i>	16
Multi-Axial Stress Creep Consumption Part I; Testing and Validation of Ex-Service 347 SS <i>Tepei Suzuki, Yoichi Ishizaki</i>	25
Development of Prediction Tool for Flow-Accelerated Corrosion: (2) Evaluation of Geometry Factor for Various Pipe Components <i>Tomohisa Yuasa, Shun Watanabe, Kimitoshi Yoneda, Ryo Morita</i>	34
Multi-Axial Stress Creep Consumption Part II; Consideration on Creep Criteria Temperature for FFS <i>Yoichi Ishizaki, Tepei Suzuki</i>	41
Development of Prediction Tool for Flow-Accelerated Corrosion (1) Evaluation of Pipeline Layout Effect Considering Various Pipe Component Combinations <i>Kimitoshi Yoneda, Tomohisa Yuasa, Yuta Uchiyama, Ryo Morita</i>	51
A Study of Stress Relaxation Cracking Mechanism in a 347H Steel Pipe-Shoe Weldment After Five-Year Service <i>Yiyu Wang, Yi Yang, Yanfei Gao, Jorge Penso, Zhili Feng</i>	59
Development of Prediction Tool for Flow-Accelerated Corrosion (4) Development and Validation of Prediction Software "FALSET" With Water Single-Phase FAC Data Obtained in Japanese PWR Plants <i>Ryo Morita, Yuta Uchiyama, Kazutoshi Fujiwara, Kimitoshi Yoneda</i>	66
Development of Prediction Tool for Flow-Accelerated Corrosion: (3) Development and Validation of Prediction Software "FALSET" With Water Single-Phase FAC Data Obtained in Japanese BWR Plants <i>Yuta Uchiyama, Ryo Morita, Kazutoshi Fujiwara, Kimitoshi Yoneda</i>	74
Fitness-for-Service Assessment of Refractory Lined Duct With Hot Spot <i>Eui Jong Yoo, Chongmyung Kim, Capjoo Choi</i>	83
Reliability and Life Assessment of Coke Drums Through Boat Sample-Based Testing <i>Nitin Saini, Zhe Lyu, Yasin Suzuk, Travis Skinner, Feng Ju, Millar Iverson, Sudeep Bohra, Leijun Li</i>	91
Hydrocracker Gasket Lipsal Design and Fabrication Learning <i>Charles Perilloux, Mary Catherine Huff, Amy Adams, John Rhodes, Jorge Penso, Robert Stierwald</i>	105

Development of Conservative Material Properties to Account for Concrete Degradation Mechanisms With Specific Emphasis on Rebar Corrosion Due to Chloride Ingress	112
<i>K. M. Browning, L. Hasa, F. H. E. de Haan-de Wilde</i>	
Experimental Analysis of Dynamic Operations of the Main Steam Relief Isolation Valve Used in Nuclear Power Plants	125
<i>Weihao Zhou, Chaoyong Zong, Qingye Li, Songzhi Jiang, Yanliang Liu, Xueguan Song</i>	
Repair of a Check Valve Seal	133
<i>Alton Reich, Roberto DiSalvo</i>	
Experimental and Numerical Investigations on the Relaxation Behaviour of Power Plant Flange Connections Under Steady State and Transient Conditions	138
<i>Kevin Kettler, Andreas Klenk, Stefan Weihe</i>	
Reliability of a Composite Lined Pipe for Trenchless Rehabilitation of Thermal Pipelines Based on a Two-Heating-Season Long Field Test in China	150
<i>Yingdi Wang, Shuo Yan, Xiangjing Zeng, Liang Zhang, Jianfeng Shi</i>	
Insulation Materials Used in Tanks for the Storage of Cryogenic Fluids in Fire Scenarios	156
<i>Robert Eberwein, Aliasghar Hajhariri, Davide Campese, Giordano Emrys Scarponi, Valerio Cozzani, Frank Otremba</i>	
Parametric Numerical Assessment of an Aerojet General Nucleonics Reactor Against Postulated Fire Conditions	164
<i>Jae-Min Jyung, Yoon-Suk Chang</i>	
Deterministic Leak-Before-Break Treatment of Uncertainties: Part 1 - Theoretical Basis	170
<i>Michael J. Kozluk, Maher Al-Dojayli, Renita Pavia, Ernie Mileta</i>	
Research and Application of a Dynamic Risk Management System for the Petrochemical Unit in Extended Service	181
<i>Zhiyuan Han, Jun Li, Juanbo Liu, Guoshan Xie, Haoyuan Kang</i>	
Deterministic Leak-Before-Break Treatment of Uncertainties: Part 2 - Example Application	189
<i>Michael J. Kozluk, Maher Al-Dojayli, Renita Pavia, Ernie Mileta</i>	
A Survey of Failure Rate of In-Service Pressure Vessels in China's Non-Nuclear Industry.....	201
<i>Libin Song, Jun Li, Zhiyuan Han, Guoshan Xie, Guide Deng, Zhifeng Li</i>	
Stress Analysis and Backfilling Measures of Gas Pipeline Buried in Embankment of Tunnel	206
<i>Jia Wu, Li Xia, Ping Tang</i>	
Application of Dynamic RBI and IOW Technology in Crude Distillation Unit.....	214
<i>Juanbo Liu, Jun Li, Chang Liu, Zhiyuan Han, Guoshan Xie, Libin Song, Sheng Chen, Haoyuan Kang</i>	
Storage Life and Surveillance of the 9975 Shipping Package	220
<i>Steve J. Hensel, Andrew J. O'Grady</i>	
Thermal Modeling of Hanford Lead Canister's Heater Bench Tests	223
<i>Sarah R. Suffield, Ben J. Jensen, Nicholas A. Klymyshyn</i>	
Modeling a Spent Nuclear Fuel Cask Seismic Test	232
<i>Nicholas Klymyshyn, Kevin Kadooka, James Fitzpatrick, Casey Spitz</i>	

3D Metrology Analysis of Structural Damages on Type B Shipping Container Compared to Predicted FEA Results After Completion of NCT and HAC Regulatory Testing.....	238
<i>Paul Nogradi, Oscar Martinez, Abiodun Adeniyi, Lance Lowe, Ross Whittenbarger, Ryan Fisher, Austin McLaurine</i>	
Additive Manufacturing and Regulatory Testing of Canisters for Spent Nuclear Fuel Management	243
<i>Oscar Martinez, Dominic Giuliano, Wei Tang, Paul Nogradi, Abiodun Adeniyi, Lance Lowe</i>	
Supplemental Structural Analyses Used in Support of Certification of the Defense Programs Package 3.....	249
<i>Peter J. Sakalaukus Jr., Nathan P. Barrett, Brian J. Koepfel</i>	
Free Drop Impact Data Acquisition Using Digital Image Correlation	256
<i>Veronica Montgomery, Oscar Martinez, Paul Nogradi, Lance Lowe, Abiodun Adeniyi</i>	
Mechanical Responses of 316L Stainless Steel Printed by Wire Arc Additive Manufacturing With Different Thermal Histories.....	262
<i>Wei Tang, Dominic Giuliano, Oscar Martinez, Maxim Gussev, Andrzej Nycz, Ke An, Luke Meyer, Chris Masuo, Dunji Yu, William Carter, Alex Walters, Riley Wallace, Derek Vaughan</i>	

Author Index