

# **CONTENTS** / MAY 2014—VOL. 186, NO. 2

iii Foreword: Special Issue on the Fukushima Daiichi Accident / Andrew Klein, Akira Tokuhiro

### **TECHNICAL PAPERS**

#### **REACTOR SAFETY**

- 115 The Canary, the Ostrich, and the Black Swan: A Historical Perspective on Our Understanding of BWR Severe Accidents and Their Mitigation / Sherrell R. Greene
- 139 NRC's Significance Determination Process: Current Status and Future Trends in Assessing Risks Attributed to External Events / Sunil D. Weerakkody
- 145 Insight from Fukushima Daiichi Unit 3 Investigations Using MELCOR / Kevin R. Robb, Matthew W. Francis, Larry J. Ott
- 161 MELCOR Simulations of the Severe Accident at the Fukushima Daiichi Unit 1 Reactor / Randall Gauntt, Donald Kalinich, Jeffrey Cardoni, Jesse Phillips
- 179 MELCOR Simulations of the Severe Accident at Fukushima Daiichi Unit 3 / Jeffrey Cardoni, Randall Gauntt, Donald Kalinich, Jesse Phillips
- 198 A Reassessment of Low Probability Containment Failure Modes and Phenomena in a Long-Term Station Blackout / Acacia Brunett, Richard Denning, Tunc Aldemir

#### **FISSION REACTORS**

216 Estimation of the Depressurization Process of Fukushima Daiichi NPP Unit 1 with SAMPSON / Maolong Liu, Yuki Ishiwatari, Koji Okamoto

#### REACTOR SAFETY

- 229 Material Effect in the Nuclear Fuel-Coolant Interaction: Analyses of Prototypic Melt Fragmentation and Solidification in the KROTOS Facility / Vaclav Tyrpekl, Pascal Piluso, Snejana Bakardjieva, Olivier Dugne
- 241 Early Phase Accident Progression Analysis of Fukushima Daiichi Unit 3 by the SAMPSON Code / Marco Pellegrini, Hiroaki Suzuki, Hideo Mizouchi, Masanori Naitoh
- 255 Analysis of Accident Progression with the SAMPSON Code in Fukushima Daiichi Nuclear Power Plant Unit 2 / Hiroaki Suzuki, Masanori Naitoh, Atsuo Takahashi, Marco Pellegrini, Hidetoshi Okada

(Continued)

# **CONTENTS** / MAY 2014—VOL. 186, NO. 2

## (Continued)

- **263** Update of the First TEPCO MAAP Accident Analysis of Units 1, 2, and 3 at Fukushima Daiichi Nuclear Power Station / Yasunori Yamanaka, Shinya Mizokami, Manabu Watanabe, Takeshi Honda
- 280 Successful Cold Shutdown of Onagawa: The Closest Nuclear Power Station to the March 11, 2011, Epicenter / Akiyoshi Obonai, Takao Watanabe, Kazuo Hirata

# **TECHNICAL NOTE**

## **REACTOR SAFETY**

295 KAERI's Development of LWR Accident-Tolerant Fuel / Yang-Hyun Koo, Jae-Ho Yang, Jeong-Yong Park, Keon-Sik Kim, Hyun-Gil Kim, Dong-Joo Kim, Yang-II Jung, Kun-Woo Song