

Molten Salt Reactor Workshop 2017—Key Technology and Safety Issues for MSRs

Workshop Objectives: Provide a forum for sharing information and status on MSR R&D programs, technology developments, international collaborations, and state of maturity of evolving MSR technologies; and for 2017 put a special emphasis on safety and licensing topics to initiate discussions on these key areas to identify needed R&D and tool development to support the ultimate licensing of MSRs.

Final Agenda as of October 4, 2017

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| Event contacts | Gary Mays, 865-574-0394 (office); 865-599-5303 (mobile); maysqt@ornl.gov David Holcomb, 865-576-7889 (office); 865-898-2193 (mobile); holcombde@ornl.gov | | |
| Tuesday, October 3, 2017 | | | |
| Time | Event | Lead | Location |
| 7:00-8:00 a.m. | ORNL Visitor Center Check-in | | ORNL Conference Center, TN Rooms 202 A-C |
| 8:00-9:30 a.m. | <p>Welcome</p> <ul style="list-style-type: none"> ORNL Welcome <p>Keynote Talks (Working Breakfast)</p> <ul style="list-style-type: none"> DOE Nuclear Technology and R&D Overview of the IAEA Activities on Advanced Reactor Technology and those Related to MSRs Workshop Overview | <p>Alan Icenhour, Associate Laboratory Director, Nuclear Science and Engineering Directorate, ORNL</p> <p>John Herczeg, Deputy Assistant Secretary, DOE-NE</p> <p>Frederik Reitsma, International Atomic Energy Agency</p> <p>Alan Icenhour, ORNL</p> | |
| 9:30-10:30 a.m. | <p>1 – Highlights—DOE 2017 Molten Salt Chemistry Workshop</p> <ul style="list-style-type: none"> Objectives, Organization, and Key Findings DOE-NE R&D Plans for Post Workshop | <p>Stephen Kung, DOE-NE, Session Chair</p> <p>Phil Britt, ORNL Stephen Kung, DOE-NE</p> | |
| 10:30-10:45 a.m. | Break | All | |

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| Tuesday, October 3, 2017 (continued) | | | |
| Time | Event | Lead | Location |
| 10:45 a.m.-12:15 p.m. | 2 – DOE Enhanced R&D Focus on MSRs <ul style="list-style-type: none"> DOE’s Enhanced R&D Focus on MSRs MSR National Technical Director: Activities and Plans GAIN -Gateway for Accelerated Innovation in Nuclear | Ken Tobin, ORNL, Panel Moderator Brian Robinson, DOE-NE Lou Qualls, ORNL Rita Baranwal, Idaho National Laboratory | ORNL Conference Center, TN Rooms 202 A-C |
| 12:15-1:15 p.m. | Working lunch: ANS MSR Safety Standard 20.2 – Update and MSRE Remote Maintenance Film | David Holcomb, ORNL | |
| 1:15-2:45 p.m. | 3 – Deep Dive on MSRE Design, Operations, and Authorization <ul style="list-style-type: none"> MSRE Design Features MSRE Operation Highlights Criticality Benchmark of the MSRE Historical Perspective MSRE Safety Basis Authorization | Jess Gehin, ORNL, Panel Moderator Scott Greenwood, ORNL Jordan Rader, ORNL Max Fratoni, UC Berkeley George Flanagan, ORNL | |
| 2:45-4:00 p.m. | 4 – MSR Safety & Regulatory Related Topics <ul style="list-style-type: none"> NRC’s Vision and Strategy for Non-Light Water Reactors Licensing Novel Technologies within the US Nuclear Regulatory Commission’s Existing Regulatory Framework Perspectives on Technical Assessments of New Reactor Technologies Summary of Analysis of Consensus Standards for Advanced Reactors | Don Williams, ORNL, Panel Moderator Joe Williams, US NRC-NRO Steve Lynch, US NRC-NRR Marcel de Vos, Canadian Nuclear Safety Commission Mike Muhlheim, ORNL | |

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| 4:00-4:15 p.m. | Break | All | ORNL Conference Center, TN Room 202 A-C |
| 4:15-5:30 p.m. | 5 – Modeling & Simulation <ul style="list-style-type: none"> • Overview of DOE-NE Advanced Modeling and Simulation Program • Multiphysics Simulations of MSRs • Thermal-Hydraulics Research in NEAMS for MSRs • SCALE Capabilities for MSRs | Brad Rearden, ORNL, Panel Moderator Chris Stanek, LANL (Brad Rearden, ORNL) Benjamin S. Collins, ORNL David Pointer, ORNL Ben Betzler, ORNL | |
| 5:30-5:45 p.m. | Break | All | |
| 5:45 p.m. | Heavy Hors d'oeuvres (in lieu of dinner) Reception: SPECIAL ACTIVITY <ul style="list-style-type: none"> • Developing Next Generation MSR Trailblazers: "Leveraging the NEUP Experience" | All Panel Members: Raluca Scarlat, UW Madison Max Fratoni, UC Berkeley John Stempien, Idaho National Laboratory Brandon Chisholm, Vanderbilt University Tommy Cisneros, TerraPower | |
| 7:30 p.m. | Adjourn Day 1 | All | |

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| Wednesday, October 4, 2017 | | | |
| Time | Event | Lead | Location |
| 8:00-8:15 a.m. | Day 2 Overview and Focus | Alan Icenhour, ORNL | ORNL Conference Center, TN Rooms 202 A-C |
| 8:15-9:15 a.m. | Keynote Talks (Working Breakfast) <ul style="list-style-type: none"> Nuclear Energy Institute—Advanced Reactors and National Nuclear Energy Strategy Hardware, Testing, and Measurements for MSRs | Maria Korsnick, President and Chief Executive Officer, Nuclear Energy Institute Jeff Latkowski, Vice President for Innovation, TerraPower | |
| 9:15-10:15 a.m. | 6 – NRC Non-LWR Issues Implementation Action Plan Strategies and Special Topics <ul style="list-style-type: none"> Fuel Qualification Licensing Basis Events (LBEs) Source Terms Tools for Accident Analyses | Gary Mays, Panel Moderator NRC Speaker 1: Joe Williams, US NRC-NRO <ul style="list-style-type: none"> Making the Case: Considerations for Demonstrating Safety of an MSR NRC Speaker 2: Stephen Bajorek, US NRC-RES <ul style="list-style-type: none"> Update on NRC Activities for Modeling & Simulation of Non-LWRs | |
| 10:15-10:30 a.m. | Break | All | |
| 10:30-11:30 a.m. | 6.1 – Fuel Qualification <ul style="list-style-type: none"> Fuel Qualification for MSRs MSR Fuel Modeling and Simulation Thermophysical Properties Measurements of MSR Fuels | Gary Mays, Panel Moderator George Flanagan, ORNL Jake McMurray, ORNL Ondrej Benes, European Commission-Joint Research Centre | |

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| Time | Event | Lead | Location |
| 11:30 a.m.-12:30 p.m. | 6.2 – Licensing Basis Events <ul style="list-style-type: none"> • LBEs for FHRs • Use of PRA for Determining LBEs • Licensing Basis Event Selection Case Study: The MSRE | Gary Mays, Panel Moderator Raluca Scarlat, UW Madison Amir Afzali, Southern Nuclear Company Brandon Chisholm, Vanderbilt University | ORNL Conference Center, TN Rooms 202 A-C |
| 12:30-1:30 p.m. | Working lunch: Status of Czech MSR/FHR Program | Jan Uhlir, Research Centre Řež | |
| 1:30-2:30 p.m. | 6 – NRC Non-LWR Issues (continued) 6.3 – Source Terms <ul style="list-style-type: none"> • Tritium Transport Modeling in FHRs • Salt Chemistry and Redox Control • Data Needs for Chloride Salts | David Holcomb, Panel Moderator John Stempien, Idaho National Laboratory Jinsuo Zhang, Virginia Tech Ed Pheil, Elysium Industries | |
| 2:30-3:30 p.m. | 6.4 – Tools for Accident Analysis <ul style="list-style-type: none"> • Accident Progression Analysis and Modeling for MSRs • Benchmarking and Validation of Transient Simulation Tools for Liquid Fuel MSRs • Natural Circulation Modeling with Simulant Fluids | Nicholas Brown, Penn State University Manuele Aufiero, UC Berkeley Per Peterson, UC Berkeley | |
| 3:30-3:45 p.m. | Break | All | |

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| Time | Event | Lead | Location |
| 3:45-4:45 p.m. | 7 – Support for Salt Technologies <ul style="list-style-type: none"> • Dutch Molten Salt Irradiation Program • MSR Technical Working Group Update • Natural Circulation Salt Heat Transfer | David Holcomb, Panel Moderator Ralph Hania, Nuclear Research and Consultancy Group Nicholas Smith, Southern Company Xiaodong Sun, University of Michigan | ORNL Conference Center, TN Rooms 202 A-C |
| 4:45-5:00 p.m. | Closing Remarks Workshop Highlights and Closing Remarks | Alan Icenhour, ORNL | |
| 5:00 p.m. | Adjourn Day 2 | All | |