



# GIF Risk and Safety Working Group (RSWG) activities and collaboration with IAEA

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# RSWG Goals

- RSWG goals:
  - Promote a consistent approach on safety, risk, and regulatory issues between six Gen-IV systems
  - Propose safety principles, objectives, and attributes based on Gen-IV safety goals to inform R&D plans
  - Support implementation of technology-neutral Integrated Safety Assessment Methodology (ISAM)
  - Interface with IAEA, OECD/NEA's WGSAR and other regulatory stakeholders
- In 2020, SFR SDC TF members have joined RSWG
- Last RSWG virtual meeting on June 30-July 1, 2020

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# Ongoing RSWG Activities

- Update of 2008 GIF Basic Safety Approach report
  - Integration of post-Fukushima requirements
  - Alignment plant states with the levels of defense-in-depth
  - Assuring independence of design features in DiD levels
  - Definition, and guidance for selection, of practically eliminated cases
- Collaborations with six GIF System Steering Committees on:
  - White papers and system safety assessments
  - Safety design criteria development
- Joint GIF-WGSAR initiative on development of risk-informed approach for:
  - Licensing basis event selection
  - SSC safety classification

# RSWG Collaborations with SSCs

## SFR

- White paper on pilot application of ISAM
  - [https://www.gen-4.org/gif/jcms/c\\_85437/gif-rswg-sfr-white-paper-vs14-final-sept2016](https://www.gen-4.org/gif/jcms/c_85437/gif-rswg-sfr-white-paper-vs14-final-sept2016)
- System Safety Assessment Report
  - [https://www.gen-4.org/gif/jcms/c\\_95916/gif-sfr-safetyassessment-20170427-final](https://www.gen-4.org/gif/jcms/c_95916/gif-sfr-safetyassessment-20170427-final)
- Safety design criteria and guidelines
  - [https://www.gen-4.org/gif/jcms/c\\_99903/gif-sdc-report-rev1-sept30-2017-afterregpg20171024a](https://www.gen-4.org/gif/jcms/c_99903/gif-sdc-report-rev1-sept30-2017-afterregpg20171024a)
  - [https://www.gen-4.org/gif/jcms/c\\_116489/gif-safety-approach-sdg-august-2019](https://www.gen-4.org/gif/jcms/c_116489/gif-safety-approach-sdg-august-2019)

## LFR

- White paper on pilot application of ISAM
  - [https://www.gen-4.org/gif/jcms/c\\_67650/lead-cooled-fast-reactor-lfr-risk-and-safety-assessment-white-paper](https://www.gen-4.org/gif/jcms/c_67650/lead-cooled-fast-reactor-lfr-risk-and-safety-assessment-white-paper)
- System Safety Assessment Report
  - [https://www.gen-4.org/gif/jcms/c\\_118389/gif-lfr-ssa-june-2020](https://www.gen-4.org/gif/jcms/c_118389/gif-lfr-ssa-june-2020)
- Safety design criteria
  - Pending final revision by LFR-SSC

# RSWG Collaborations with SSCs (cont.)

## GFR

- White paper on pilot application of ISAM
  - [https://www.gen-4.org/gif/jcms/c\\_85766/rswg-gfr-white-paper-final-2016](https://www.gen-4.org/gif/jcms/c_85766/rswg-gfr-white-paper-final-2016)
- System Safety Assessment Report
  - Pending SSC update based on comments from RSWG review
- Safety design criteria
  - Pending SSC update based on comments from RSWG review

## SCWR

- White paper on pilot application of ISAM
  - [https://www.gen-4.org/gif/jcms/c\\_95915/scwr-white-paper-rev-01-2017](https://www.gen-4.org/gif/jcms/c_95915/scwr-white-paper-rev-01-2017)
- System Safety Assessment Report
  - [https://www.gen-4.org/gif/jcms/c\\_103619/gif-scwr-safetyassessment-finaldec2018](https://www.gen-4.org/gif/jcms/c_103619/gif-scwr-safetyassessment-finaldec2018)
- Safety design criteria
  - Less significant changes with respect to IAEA SSR 2/1 due to similarity of thermal-spectrum SCWR design tracks with LWRs

# RSWG Collaborations with SSCs (cont.)

## VHTR

- White paper on pilot application of ISAM
  - [https://www.gen-4.org/gif/jcms/c\\_95914/rswg-vhtr-white-paper-version-3-2015](https://www.gen-4.org/gif/jcms/c_95914/rswg-vhtr-white-paper-version-3-2015)
- System Safety Assessment Report
  - [https://www.gen-4.org/gif/jcms/c\\_103659/gifvhtr-safety-assessment-finaldec2018](https://www.gen-4.org/gif/jcms/c_103659/gifvhtr-safety-assessment-finaldec2018)
- Safety design criteria
  - Planned through collaborations with IAEA through use of draft report from “IAEA-CRP on HTGR Safety Design” as the starting point for further development
  - VHTR SSC and RSWG will coordinate GIF contributions with IAEA (work has not started due to Covid-19 related delays)

## MSR

- White paper and system safety assessment report
  - Pending SSC update based on comments from RSWG review
- Safety design criteria
  - A RSWG/MSR-SSC subgroup is envisioned to focus on establishment of MSR safety approaches (an RSWG questionnaire is being prepared)

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# New RSWG-WGSAR Joint Initiative

- Technology-inclusive risk-informed approach for event selection, component classification, and DiD assessment for six systems
  - Structured approach to incorporate risk insights into safety assessments and regulatory decisions
- Effort was proposed to, and endorsed by, WGSAR at end of 2018
  - US completed first draft in January 2020 for RSWG review/revisions
  - Comments received from Japan, Korea, EURATOM, South Africa, France
  - Revised draft was distributed and discussed at the last RSWG meeting in June 2020—No consensus was achieved
  - Additional comments are expected before the next RSWG meeting in October 2020
  - Revised draft will not likely be available to share with WGSAR before the end of 2020

# RSWG Collaboration with IAEA

- GIF-IAEA joint workshops
  - 9<sup>th</sup> joint IAEA-GIF technical meeting/workshop on the safety of liquid metal-cooled fast reactors
    - » to discuss the development of SDGs for SFRs and SDC for LFRs
    - » originally planned in March 2020, will be postponed until January 2021
  - Joint IAEA-GIF technical meeting on the safety of high temperature gas-cooled reactors was held on December 9-11, 2019
    - » exchanged information on GIF safety methodology, risk informed approach, SFR SDC/SDG, and IAEA CRP on modular high temperature gas-cooled reactor safety design



# RSWG Collaboration with IAEA (cont.)

- Participation in safety document development for SMRs
  - Contributions to IAEA safety standards for SMRs, most of which overlap with Gen-IV design tracks
  - Division of Nuclear Installation Safety in IAEA is interested in collaborating with GIF in the field of SMR safety such as development of TECDOC on
    - » Approaches and methodology for development of regulatory safety requirements for SMR design
    - » Safety assessment and analysis for SMR Technologies
    - » Applicability of IAEA’s safety guidance on design safety for NPPs in SMR technologies (LWRs, HTGRs, LMFRs, MSR)
  - IAEA-GIF meeting on Exploring Opportunities of Cooperation will be held on 9th of July, 2020 (tomorrow)
- Joint PRPPWG/RSWG interface with IAEA on “safety, security and safeguards by design”