



2021
Annual **INCOSE**
international workshop
Virtual Event
January 29 - 31, 2021

Resilient Systems

www.incose.org/IW2021

CHAIR

Ken Cureton (Univ of SoCal - USC)

CO-CHAIR

John Brtis (MITRE)

INCOSE WEB PAGE



<https://www.incose.org/incose-member-resources/working-groups/analytic/resilient-systems>

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Charter Summary



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WG PURPOSE/MISSION

The purpose of the Resilient Systems Working Group (RSWG) is to further the understanding of resilience of engineered systems and to provide a clear description of the principles of resilience in INCOSE publications and outreach materials.

WG GOAL(S)

The goal of the RSWG is to:

1. Codify and document the state-of-the-practice for system resilience,
2. Investigate, advance, and capture the state-of-the art for system resilience and related topics (such as Loss-Driven Systems Engineering),
3. Collaborate with other INCOSE groups to consistently apply system resilience practice, taxonomies, tools, and techniques,
4. Develop and support working group products.

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WG SCOPE

The definition of resilience, as agreed by the RSWG, is that System resilience is the ability of an engineered system to provide required capability when facing adversity.

- The term engineered system is limited to human-made systems containing software, hardware, humans (e.g. socio-technical), infrastructures, concepts, and processes.
- For the purpose of resilience, an adversity is anything that might degrade the capability provided by a system. Achieving resilience requires consideration of all sources and types of adversity; e.g., from environmental sources human, sources, or system failure; from adversarial, friendly, or neutral parties; adversities that are malicious or accidental; adversities that are expected or not. Adversities may be issues, risks, or unknown-unknowns. Adversities may arise from inside or outside the system.
- The fundamental objectives of resilience are avoiding, withstanding, and recovering from adversity.
- Resilience focuses on providing required capability - not necessarily with maintaining the architecture or composition of the system.

OUTCOMES (PRODUCTS/SERVICES)

The primary products are:

- INCOSE Systems Engineering Handbook (SEH) sections regarding System Resilience
- INCOSE Systems Engineering Body of Knowledge (SEBoK) sections regarding System Resilience and related topics
- INCOSE Vision sections regarding System Resilience and related topics
- Other special publications, e.g. INCOSE Insight issues, Systems Resilience Primer



IW OUTCOMES

Discuss SEBoK Update for Resilient Systems - Thursday 28 Jan 2021

- New participants
- Reviewed RSWG repository: books, papers, articles for deletion or inclusion in the SEBoK section on System Resilience
- Reviewed current SEBoK content for Systems Resilience and recommended content additions, modifications, and deletions::
- Reordering of SEBoK content for this section
- Taxonomy from SEHv5 (with diagram)
- Techniques (the ?How?) with a few examples
- Improve SEBoK Process section from SEHv5 & New Papers
- Add patterns for Resilience Requirements (natural language, ERD, and SysML)
- Add Add Agility/Adaptability Metrics
- Expand Affordable Resilience section
- Improve sections on ?System Description?, ?Discipline Management?, ?Discipline Relationships?, ?Discipline Standards? , "Practical Considerations", Personnel Considerations" (remove?)
- Recommended an LDSE Section with some pointers/summary on Resilient Engineering
- Author assignments

RSWG Business Meeting - Friday 29 Jan 2021

- New participants
- Reviewed RSWG Charter, Scope, Objectives, Activities, and Products
- Reviewed IS2021 sessions related to RSWG
- Participant Questions & Answers

Loss-Driven Systems Engineering (LDSE) Discussion - Saturday 30 Jan 2021

- New participants
- Introduce/Describe LDSE concepts
- INCOSE Insight (December 2020) Issue Feedback
- Discussion of next steps for LDSE
- SEBoK Additions for LDSE
- Proposed IS2021 (and in the future) Activities for LDSE
- Call for LDSE Papers (for IS2022 and in the future)
- Decided to use RSWG as an Incubator for LDSE
- Participant Questions & Answers

RSWG Inputs to INCOSE Vision 2035 - Saturday 30 Jan 2021

- New participants
- Presentation of RSWG contribution to INCOSE Vision 2035
- Participant Questions & Answers

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Review/Update RSWG Video Content - Saturday 30 Jan 2021

- New participants
- Presentation of RSWG video storyboard
- Participant Questions & Answers

Brainstorming of RSWG Future activities - Sunday 31 Jan 2021

- New participants
- Brainstorming of potential new activities (beyond those already planned)

PLANNED ACTIVITIES AFTER IW

1. Achieve RSWG Work Products (listed below)
2. Finalize RSWG Team Video & LDSE Video
3. Continue Weekly RSWG Meetings (1 hour Zoom every Wednesday at 2 PM Eastern Time)
4. Plan IS2021 and IS2022 Participation
5. As needed, peer review of Papers and Dissertations that include aspects of resilient systems (includes creation of peer-reviewed papers)
6. Contribute Resilience Engineering & LDSE papers to SE Journal, IS2022, other venues & journals
7. Collaborate and participate with other INCOSE WGs and functions to consistently apply system resilience practice, taxonomies, tools, and techniques; capture the state-of-the-practice and advance the state-of-the-art in system resilience and related topics
8. Outreach & liaison with other groups, e.g. IEEE, ISO/IEC, etc.

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PLANNED WORK PRODUCTS AFTER IW

1. Review & edit INCOSE Systems Engineering Handbook (SEH) sections regarding System Resilience
2. Coordinate/harmonize other SEHv5 sections that address System Resilience
3. Update SEBoK sections regarding System Resilience, add LDSE content
4. Coordinate/harmonize other SEBoK sections that address System Resilience & LDSE
5. Review INCOSE Vision 2035 sections regarding System Resilience and related topics
6. Develop a Systems Resilience Primer (or Guide)
7. Intro to RSWG Team Video and Intro to LDSE Video