34th Annual INCOSE international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024

INCOSE

Requirements Working Group

Requirements Working Group (RWG) IS2024

Agenda

Time (CT USA)	Time (IST- Dublin)	Topic
09:30-9:45	15:30-15:45	Welcome, RWG Introductions (Katarzyna Kot)
9:45-10:15	15:45-16:15	RWG Overview, Status, Plans (Lou Wheatcraft)
10:15 -10:45	16:15 -16:45	Updates to the RWG Website (Katarzyna Kot)
10:45-11:15	16:45-17:15	Introduction to the Guide to Model-based Needs and Requirements (Jeff Williams)
11:15-11:30	17:15-17:30	NRM Fundamentals Flip Card Proposal (Rob Black)
11:30-12:00	17:30-18:00	General discussion –Collaboration within the RWG, (All)

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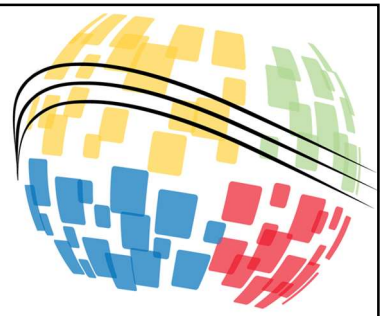


Welcome to the RWG

Lou Wheatcraft

RWG Charter

1 **Purpose**

- Advance the practice, education, and theory of systems engineering through excellence in needs and requirements definition and management, verification, and validation across the lifecycle.
- Contribute to the realization of INCOSE's Vision 2035

2 **Goals**

- Develop and maintain INCOSE's body of knowledge associated with needs and requirements development and management across all systems engineering lifecycle process activities.
- Communicate the importance and understanding of the relationship of needs and requirements to other systems engineering activities and artifacts across a system's lifecycle.
- Learn from experience and share with the SE community, particularly through engagement with other Working Groups.
- Promote best practices associated with needs, requirements, verification, and validation in today's increasingly complex, software intensive systems.
- Continue research into needs and requirements definition and management, including understanding the role of needs, requirements, verification, and validation across the lifecycle.
- Support INCOSE's efforts to move from a document-centric to a data-centric practice of SE.

3 **Scope**

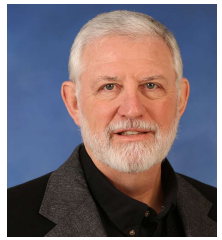
Activities relating to best practices for needs and requirements development and management throughout the product lifecycle including:

- Elicitation, Elaboration, Modeling, Analysis, Expression
- Communication, Management, Verification, Validation

RWG Leadership







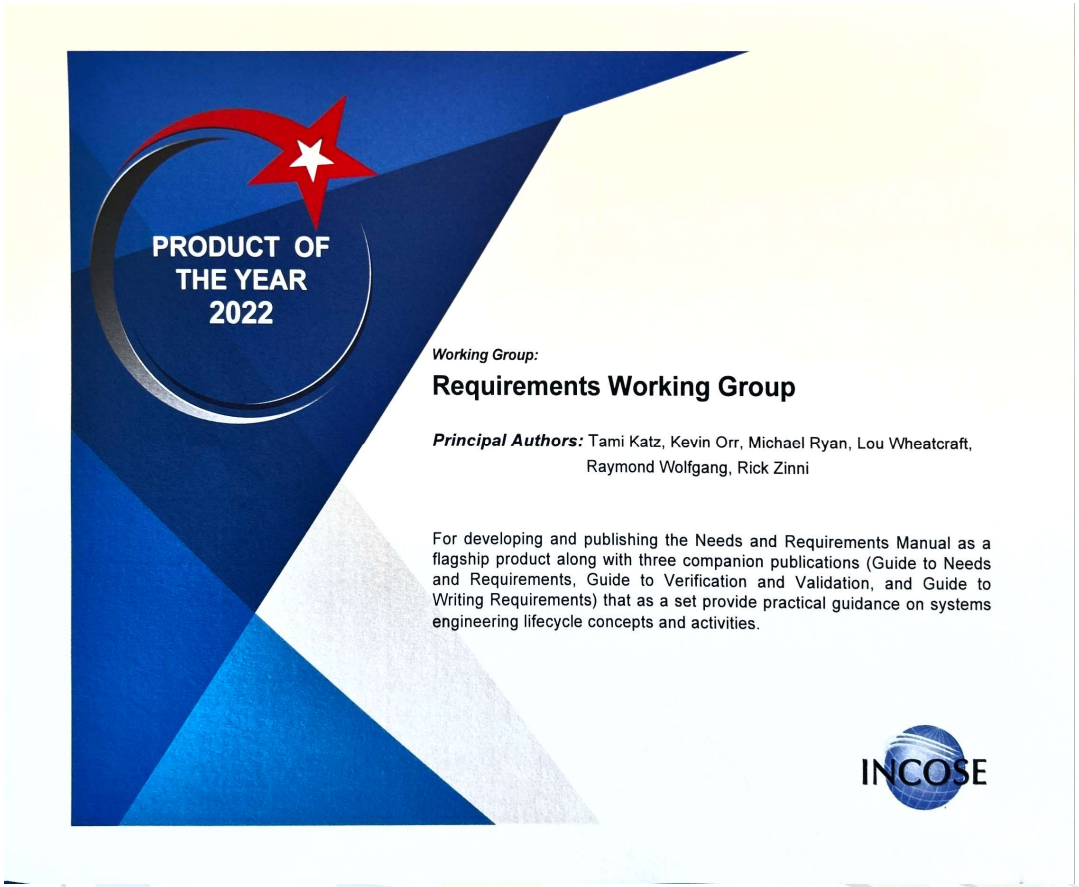

- **Chair**: Lou Wheatcraft; Wheatland Consulting, LLC, USA
- **Co-Chair**: Tami Katz; BAE Systems, USA
- **Co-Chair**: Mike Ryan; Capability Associates Pty Ltd, AU
- **Co-Chair**: Kevin Orr, Eaton, USA
- **Co-Chair**: Jeffery Williams, University of Alabama, Huntsville, USA
- **Co-Chair**: Katarzyna Kot, BA Coach, NL

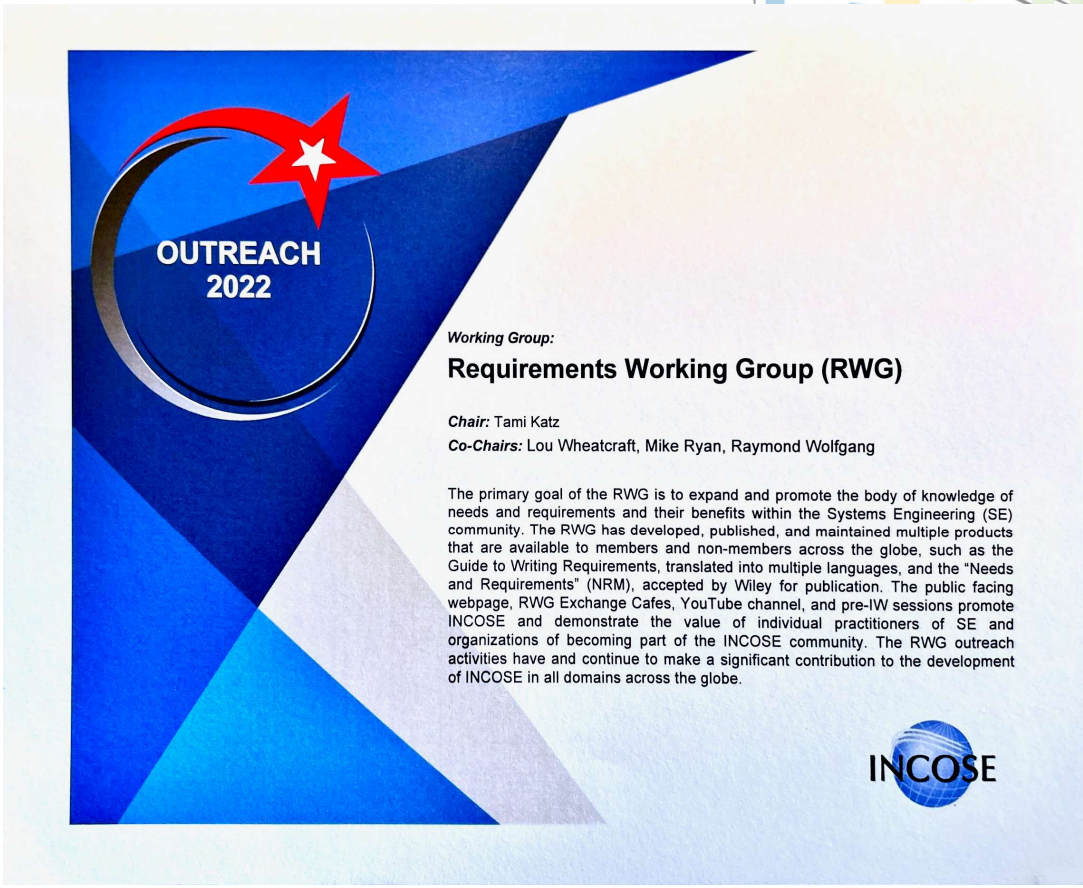
- **INCOSE Websites:**
  - https://www.incose.org/communities/working-groups-initiatives/requirements
  - https://www.incose.org/inet/working-groups/requirements
  - https://www.youtube.com/channel/UCadgYaqKWDckenP2SU8-cPw

- 1612 followers on Viva Engage, one of INCOSE's largest WGs

The RWG is comprised of members from industry and academia with a common purpose of improving the practice of systems engineering through improvement of **Needs and Requirements** definition and management across the system lifecycle.

RWG Awards Presented at IW2023

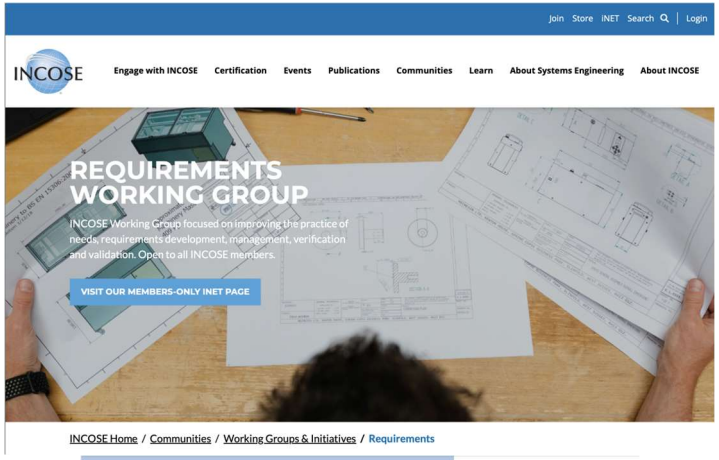


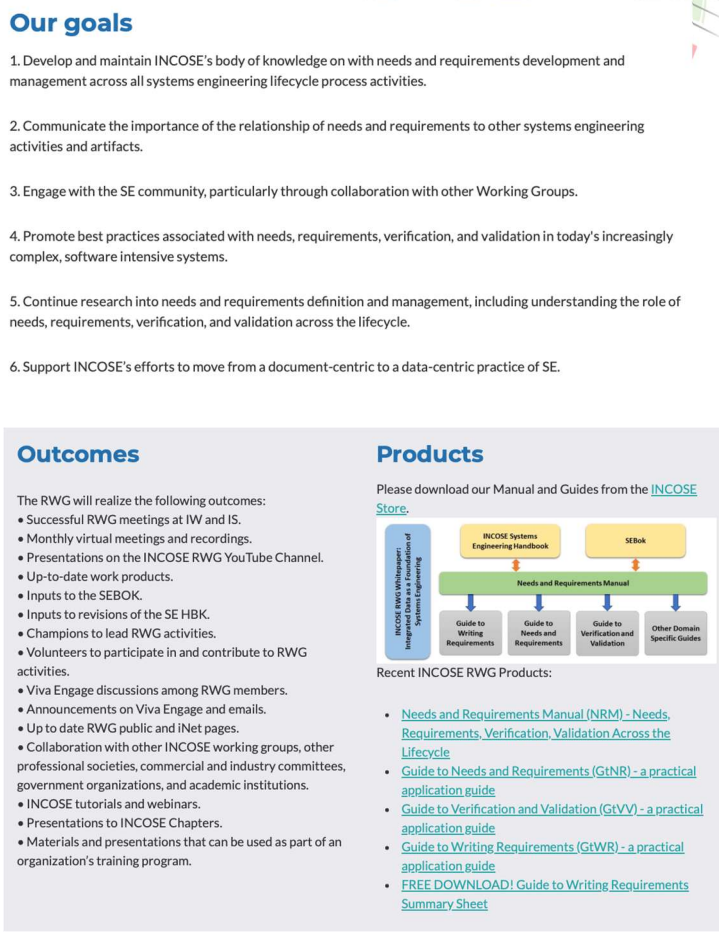


RWG Award Presented at IW2024

INCOSE RWG External Website

- The RWG maintains an external website (public facing website).
- Introduction to the RWG – purpose, goals,& objectives.
- Information on upcoming meetings.
- Introduction to our products and how to get a copy.
- How to join the RWG once you have become an INCOSE Member.
- Anyone interested in the RWG is welcome to view this site to stay informed.

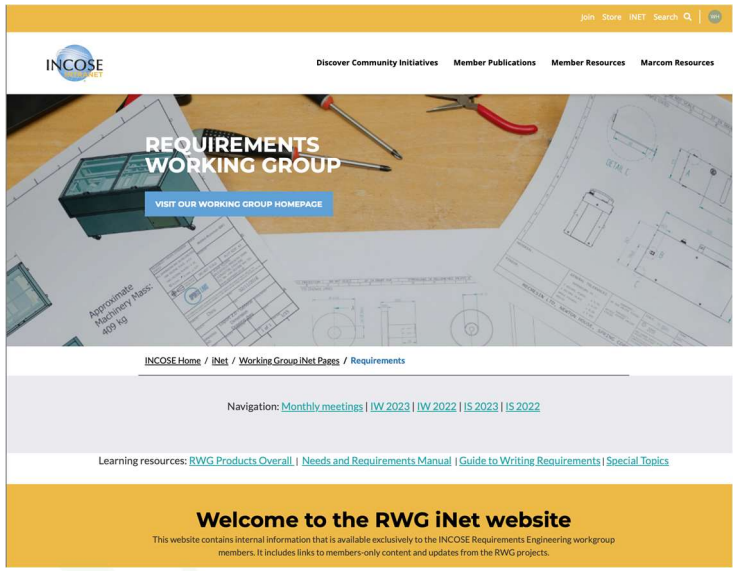


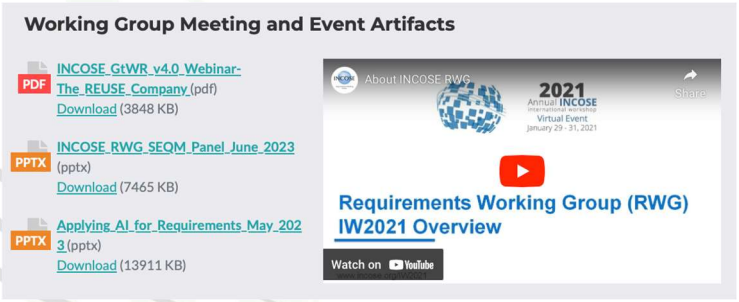


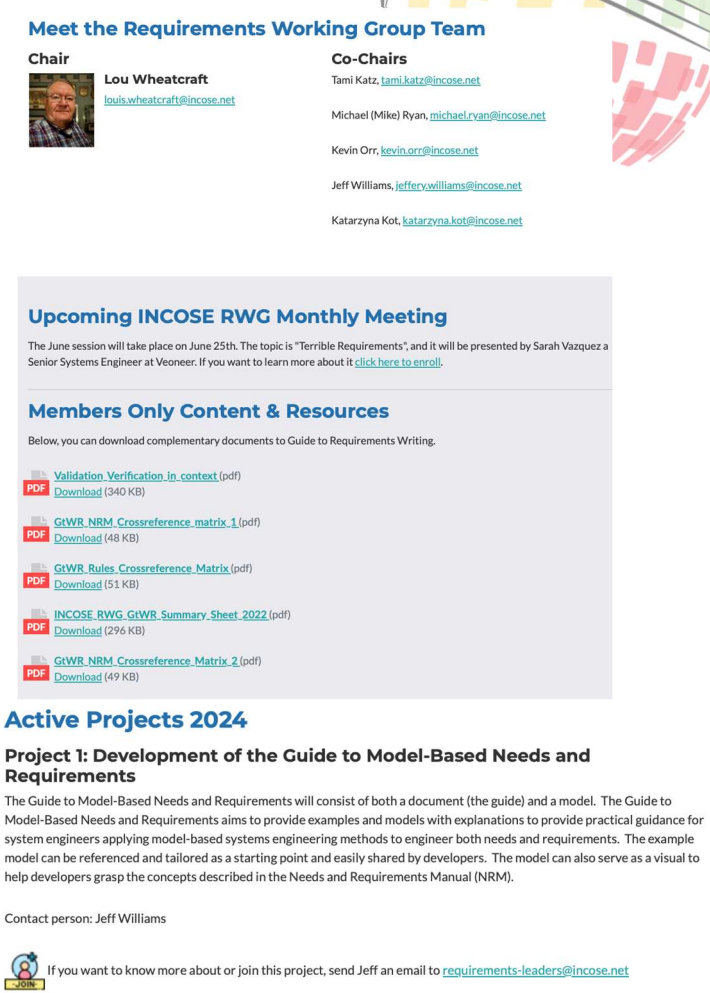
https://www.incose.org/communities/working-groups-initiatives/requirements

INCOSE RWG Internal Website (iNet)

- The “iNet” intranet site is for RWG member only resources.
- IW and IS materials and presentations.
- Training Resources
  - Links to presentations and presentation slides.
- The goal of this site is to add value to becoming an RWG member.



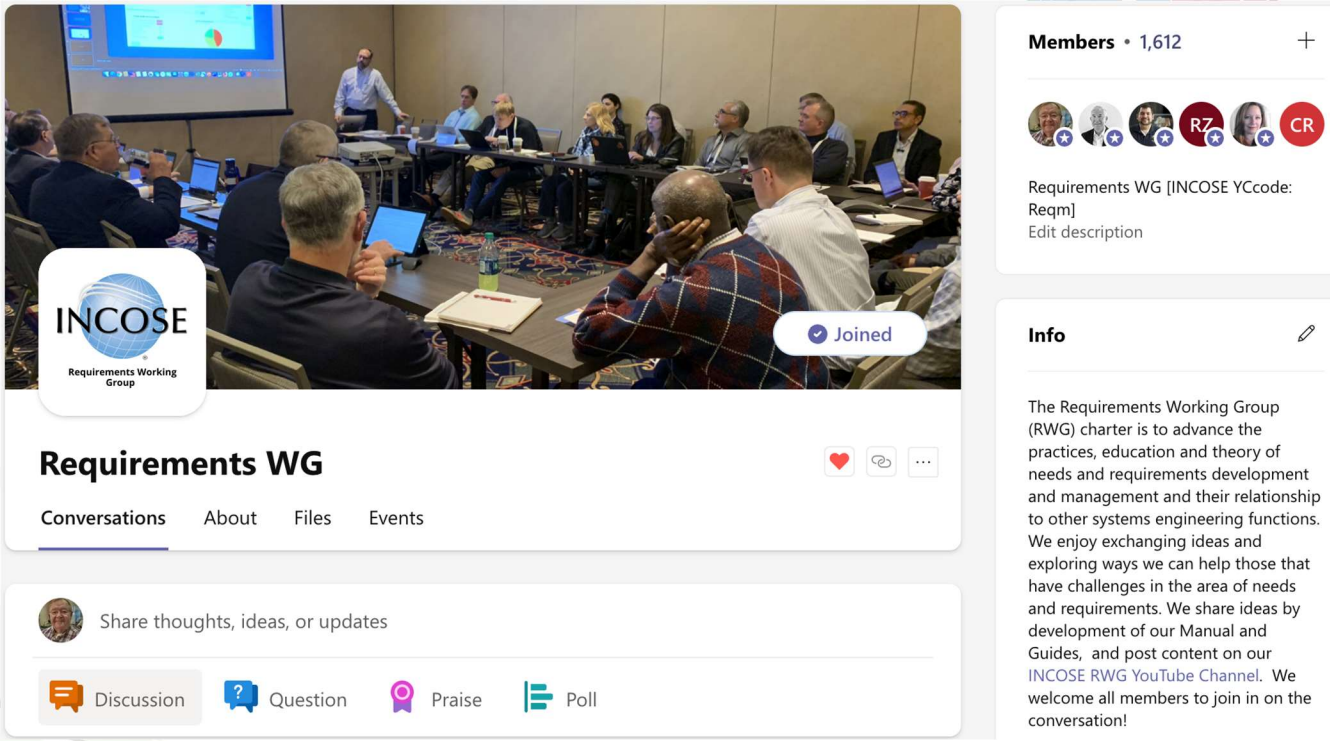




https://www.incose.org/inet/working-groups/requirements

RWG Viva Engage (Yammer) Community

- The INCOSE organization has established Microsoft platforms for INCOSE member engagement.
- Upon obtaining the member login from the INCOSE IT, navigate to Viva Engage and join the Requirements WG Community.
- This platform enables interactive announcements, questions, and discussions throughout the year!
- The RWG Community is one of the most active communities.



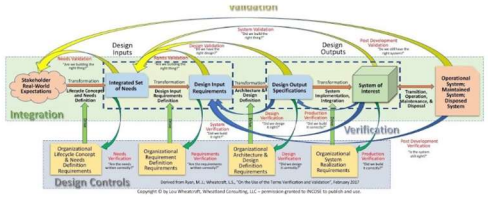
Access to Communities is through the Microsoft Teams App, Viva Engage App (iOS), or the online Microsoft Teams site.

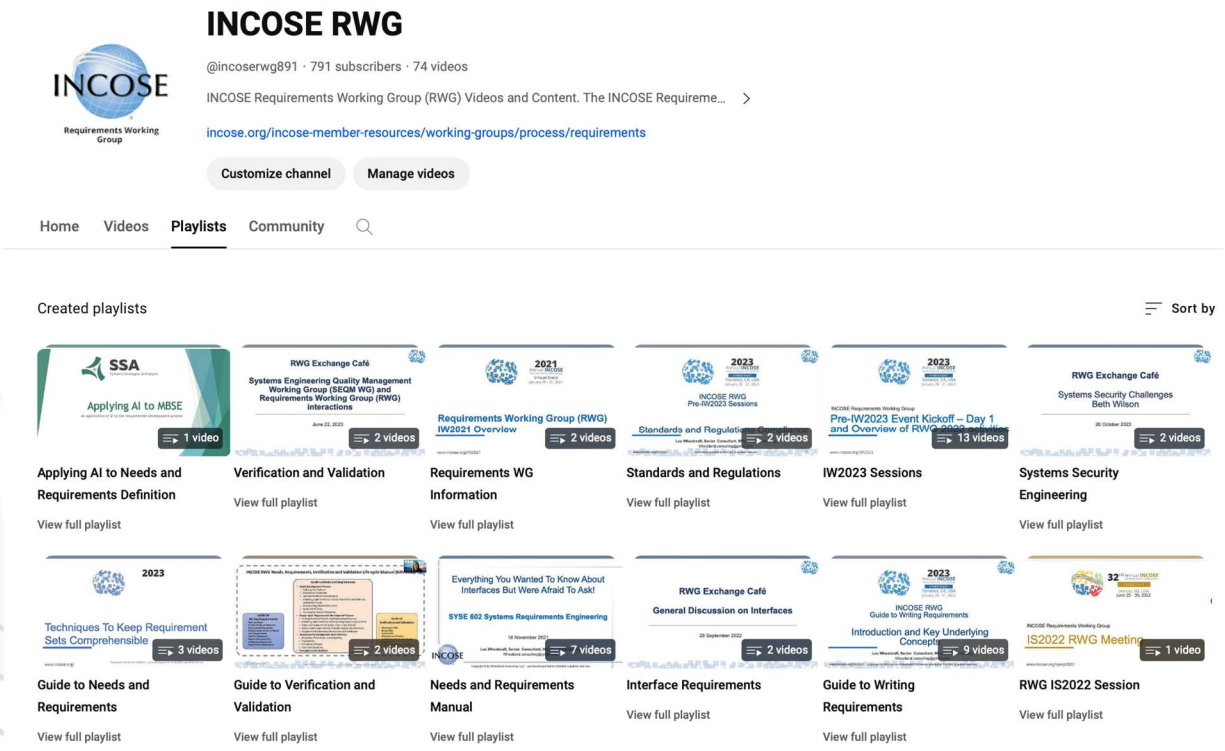
RWG Outreach Events

- RWG engages with the INCOSE community as well as the larger SE community through regular events centered around the topic of Needs, Requirements, Verification, and Validation.
  - Guest speakers on special topics
  - RWG Exchange Cafés – open discussions
- Open to INCOSE members and non-members.
- RWG members contribute ideas towards topics discussed.
- Attendees are encouraged to share their experiences and questions with the broader SE community.
- Recordings of these events are available on the INCOSE RWG YouTube Channel and also available via our iNet site (along with slides).

INCOSE RWG YouTube Channel

- INCOSE RWG YouTube channel has recordings of meetings and presentations to the broader community.
- Available to everyone to catch up on events and learn more about the RWG activities and products.
- Also exists to attract interest in joining INCOSE and the RWG and share experiences, lessons learned, best practices, wisdom, and ideas with all that engage in needs, requirements, verification, and validation activities.

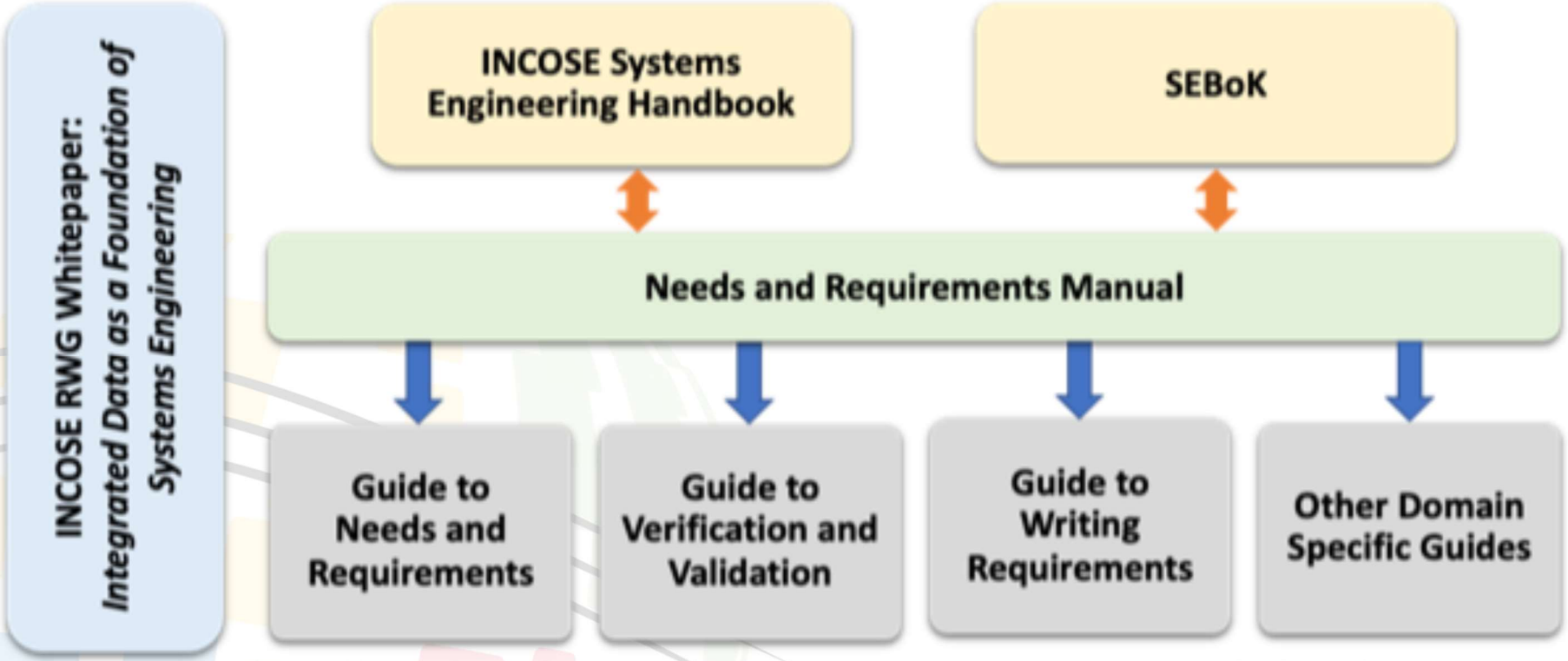




https://www.youtube.com/feed/playlists

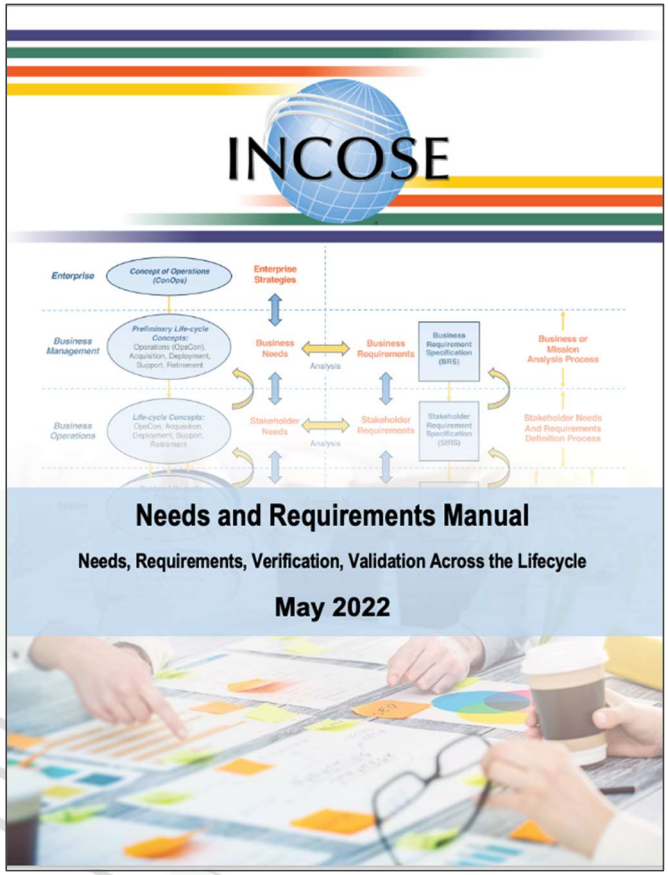
RWG Product Tree

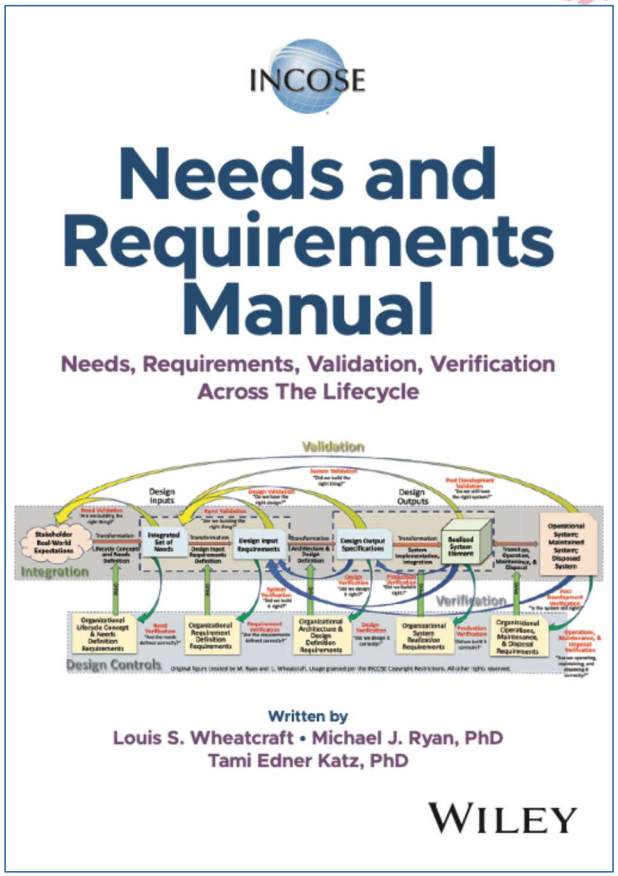
The RWG has developed a family of products and supported development of other INCOSE publications.



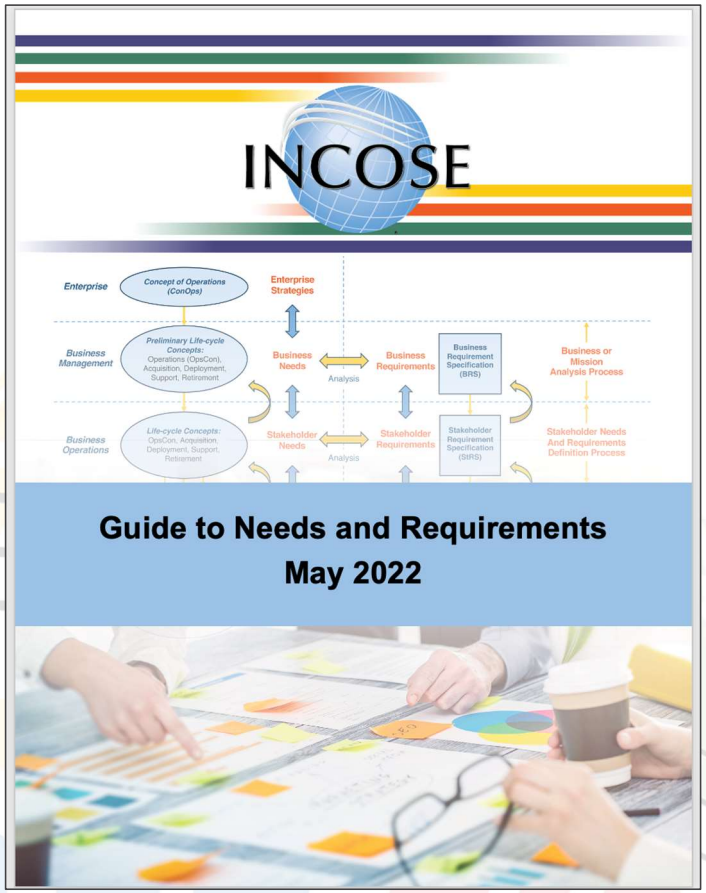
Needs and Requirements Manual (NRM)

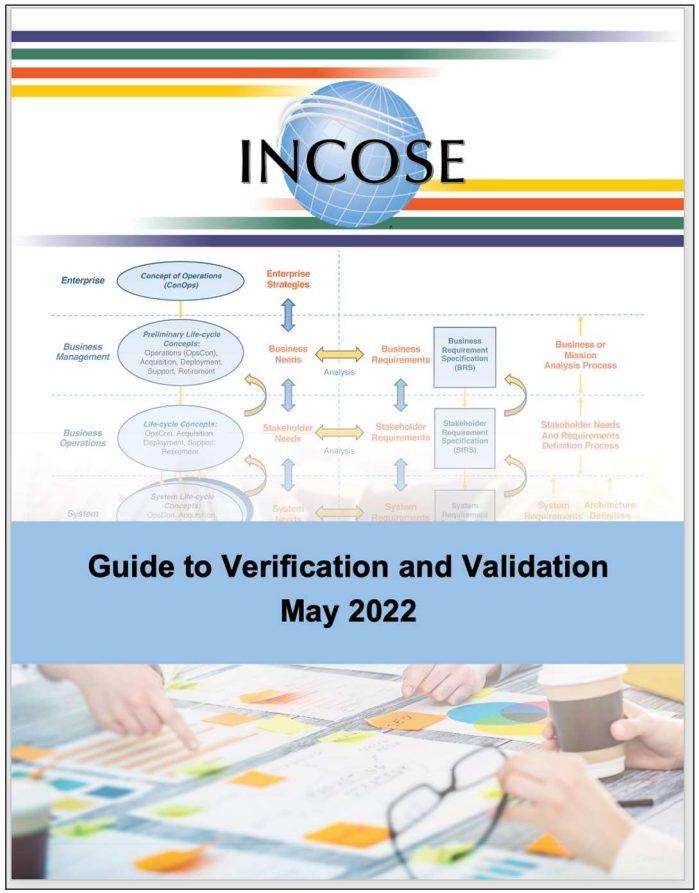
- The NRM is the RWG flagship product, V1 released in January 2022
- V1.1 minor updates in May 2022 to shorten title, add subtitle, and align with other RWG products
- Content aligns with, and expands, the INCOSE SE Handbook version 5 material.
- The NRM is being updated to Version 2, which is planned to be published by Wiley later this year.



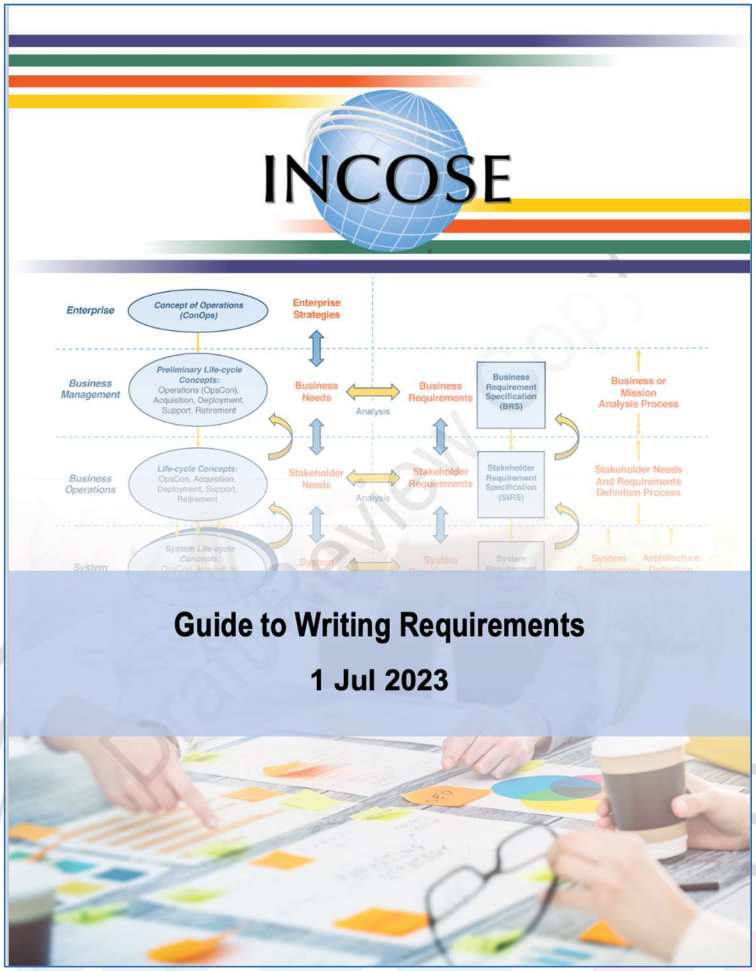


The RWG Guides Provide Practical Application of the NRM





Guide to Writing Requirements

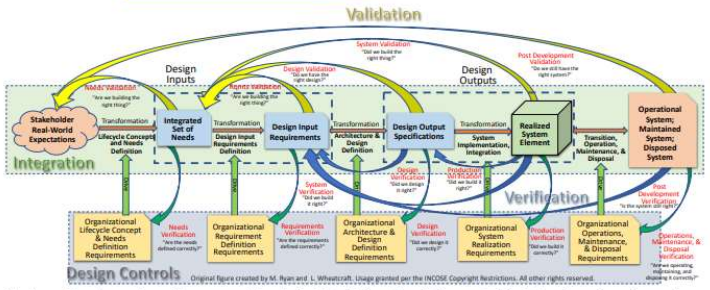


- The Guide to Writing Requirements (GtWR) has been a popular product from the RWG for many years.
- The **Gold Standard** for writing quality need and requirement statements.
- **V4 was released in June 2023.**

"The INCOSE Guide To Writing requirements is referenced in the SYS.2 System Requirements Analysis process in Automotive SPICE 4.0. This is a major step forward for the automotive industry and will drive significant interest to INCOSE and especially the Requirements Working Group." LinkedIn post 12/18/23

GtWR
7-page Summary Sheet

INCOSE Guide to Writing Requirements V4 – Summary Sheet



Needs and Requirements are the common threads that tie all lifecycle activities and artifacts together. Once the needs are verified and validated, all subsequent artifacts are validated against the needs and once the resulting design input requirements are verified and validated, all subsequent artifacts are verified against those design input requirements.

Definitions

An ***entity*** is a single item to which a concept, need, or requirement applies: an organization, business unit, project, supplier, service, procedure, SOI (system, subsystem, system element), product, process, or stakeholder class (user, operator, tester, maintainer, etc.).

*A **concept** is a textual or graphic representation that concisely expresses how an entity can fulfill the problem, threat, or opportunity it was defined to address within specified constraints with acceptable risk that provides a business in terms of people, process, and products.*

*A set of **lifecycle concepts** includes multiple concepts across the lifecycle for how the organization (and stakeholders within an organization) expects to manage, acquire, define, develop, build/code, integrate, verify, validate, transition, install, operate, support, maintain, and retire an entity.*

*A **need statement** is the result of a formal transformation of one or more sources or lifecycle concepts into an agreed-to expectation for an entity to perform some function or possess some quality within specified constraints with acceptable risk.*

A ***requirement statement*** is the result of a formal transformation of one or more sources, needs, or higher-level requirements into an agreed-to obligation for an entity to perform some function or possess some quality within specified constraints with acceptable risk.

Characteristics

When defining needs and requirements, it is important that they have the characteristics of well-formed needs and requirements. These characteristics are a result of following the rules defined in the Guide to Writing Requirements (GtWR) as well as performing the activities associated with the definition of the needs and requirements as discussed in the Needs and Requirements Manual (NRM) and Guide to Needs and Requirements (GtNR). The underlying analysis from which a need or requirement was derived is as important as how well the need or requirement statement is formed.

Formal Transformation. Given the need and requirement is a result of a formal transformation, the following characteristics of a well-formed need or requirement have been derived:

C1 - Necessary: The need requirement statement defines capability, characteristic, constraint, or quality factor *needed or required* to satisfy a lifecycle concept, need, source, or higher-level requirement.

C2 - Appropriate: The specific intent and amount of detail of the need or requirement statement is appropriate to the level (the level of abstraction, organization, or system architecture) of the entity to which it refers.

C5 - Singular: The need or requirement statement should state a single capability, characteristic, constraint, or quality factor.

C8 - Correct: The need statement must be an accurate representation of the lifecycle concept or source from which it was transformed. The requirement statement must be an accurate representation of the need, source, or higher-level requirement from which it was transformed.

C9 - Conforming: Statements and expressions of individual needs and requirements should conform to an approved standard pattern and style guide or standard for writing and managing needs and requirements.

Agreed-to Obligation. Since the need and requirement is to be a part of a fair agreement to meet an obligation, the following characteristics of a need or requirement have been derived.

C3 - Unambiguous: Need and requirement statements must be stated such that their intent is clear and can be interpreted in only one way by all intended audiences.

C4 - Complete: *The need statement sufficiently describes the necessary capability, characteristic, constraint, conditions, or quality factor to meet the lifecycle concept or source from which it was transformed.* The requirement statement sufficiently describes the necessary capability, characteristic, constraint, conditions, or quality factor to meet the need, source, or higher-level requirement from which it was transformed.

C6 - Feasible: The need or requirement can be realized within entity constraints (for example: cost, schedule, technical, legal, ethical, safety) with acceptable risk.

C7 - Verifiable: The need statement is structured and worded such that its realization can be validated to the approving authority's satisfaction. The requirement statement is structured and worded such that its realization can be verified to the approving authority's satisfaction.

Characteristics of well-formed needs and requirements.

Rules for Need and Requirement Statements and Sets of Needs and Requirements

Accuracy

R1 - Structured Statements: Need and requirement statements must conform to one of the agreed patterns, thus resulting in a well-structured complete statement.

R2 - Active Voice: Use the active voice in the need or requirement statement with the responsible entity clearly identified as the subject of the sentence.

R3 - Appropriate Subject-Verb: Ensure the subject and verb of the need or requirement statement are appropriate to the entity to which the statement refers.

R4 - Defined Terms: Define all terms used within the need statement and requirement statement within an associated glossary and/or data dictionary.

R5 - Definite Articles: Use the definite article "the" rather than the indefinite article "a".

R6 - Common Units of Measure: When stating quantities, all numbers should have appropriate and consistent units of measure explicitly stated using a common measurement system in terms of the thing the number refers.

R7 - Vague Terms: Avoid the use of vague terms that provide vague quantification, such as "some", "any", "allowable", "several", "many", "a lot of", "a few", "almost always", "very nearly", "nearly", "about", "close to", "almost", and "approximate". Avoid vague adjectives such as "ancillary", "relevant", "routine", "common", "generic", "significant", "flexible", "expandable", "typical", "sufficient", "adequate", "appropriate", "efficient", "effective", "proficient", "reasonable" and "customary."

R8 - Escape Clauses: Avoid the inclusion of escape clauses that state vague conditions or possibilities, such as "so far as is possible", "as little as possible", "where possible", "as much as possible", "if it should prove necessary", "if necessary", "to the extent necessary", "as appropriate", "as required", "to the extent practical", and "if practicable".

R9- Open-Ended Clauses: Avoid open-ended, non-specific clauses such as "including but not limited to", "etc." and "and so on".

Concision

R10 - Superfluous Infinitives: Avoid the use of superfluous infinitives such as "to be designed to", "to be able to", "to be capable of", "to enable", "to allow".

R11 - Separate Clauses: Use a separate clause for each condition or qualification.

Non-ambiguity

R12 - Correct Grammar, 13 - Correct Spelling, 14 - Correct Punctuation - Use correct grammar, spelling, punctuation.

R15 - Logical Expressions: Use a defined convention to express logical expressions such as "[X AND Y]", "[X OR Y]", [X XOR Y]", "NOT [X OR Y]".

R16 - Use of "Not": Avoid the use of "not."

R17 - Use of Oblique Symbol: Avoid the use of the oblique ("/") symbol except in units, i.e., Km/hr, or fractions.

Singularity

R18 - Single Thought Sentence: Write a single sentence that contains a single thought conditioned and qualified by relevant sub-clauses.

R19 – Combinators: Avoid words that join or combine clauses, such as "and", "or", "then", "unless", "but", "as well as" "but also", "however", "whether", "meanwhile", "whereas", "on the other hand", or "otherwise".

R20 - Purpose Phrases: Avoid phrases that indicate the "purpose of ", "intent of", or "reason for" the need statement or requirement statement.

R21 – Parentheses: Avoid parentheses and brackets containing subordinate text.

R22 – Enumeration: Enumerate sets explicitly instead of using a group noun to name the set.

R23 - Supporting Diagram, Model, or ICD: When a need or requirement is related to complex behavior, refer to a supporting diagram, model, or ICD.

Completeness

R24 – Pronouns: Avoid the use of personal and indefinite pronouns.

R25 – Headings: Avoid relying on headings to support explanation or understanding of the need or requirement.

Realism

R26 – Absolutes: Avoid using unachievable absolutes such as 100% reliability, 100% availability, all, every, always, never, etc.

Conditions

R27 - Explicit Conditions: State conditions' applicability explicitly instead of leaving applicability to be inferred from the context.

R28 - Multiple Conditions: Express the propositional nature of a condition explicitly for a single action instead of giving lists of actions for a specific condition.

Uniqueness

R29 – Classification: Classify needs and requirements according to the aspects of the problem or system it addresses.

R30 - Unique Expression: Express each need and requirement once and only once.

Abstraction

R31 – Solution Free: Avoid stating implementation in a need statement or requirement statement unless there is rationale for constraining the design.

Quantifiers

R32 - Universal Qualification: Use "each" instead of "all", "any", or "both" when universal quantification is intended.

Tolerance

R33 - Range of Values: Define each quantity with a range of values appropriate to the entity to which the quantity applies and against which the entity will be verified or validated.

Quantification

R34 - Measurable Performance: Provide specific measurable performance targets appropriate to the entity to which the need or requirement is stated and against which the entity will be verified to meet.

R35 - Temporal Dependencies: Define temporal dependencies explicitly instead of using indefinite temporal keywords such as "eventually", "until", "before", "after", "as", "once", "earliest", "latest", "instantaneous", "simultaneous", and "at last".

Uniformity of Language

R36 - Consistent Terms and Units: Ensure each term and unit of measure used throughout need and requirement sets as well as associated models and other SE artefacts developed across the lifecycle are consistent with the project's defined ontology.

R37 – Acronyms: If acronyms are used, they must be consistent throughout need and requirement sets as well as associated models and other SE artefacts developed across the lifecycle.

R38 – Abbreviations: Avoid the use of abbreviations in needs and requirement statements as well as associated models and other SE lifecycle artefacts.

R39 - Style Guide: Use a project-wide style guide for individual need statements and requirement statements.

R40 - Decimal Format: Use a consistent format and number of signification digits for the specification of decimal numbers.

Modularity

R41 - Related Needs and Requirements: Group related needs and requirements together.

R42 – Structured Sets: Conform to a defined structure or template for organizing sets of needs and requirements.

Attributes of Need and Requirement Statements (defined in the NRM)

A minimum set of attributes that should be defined for each requirement are annotated with an asterisk ("*")

Attributes to Help Define Needs & Requirement and Their Intent

A1 - Rationale*
A2 - Trace to Parent*
A3 - Trace to Source*
A4 - States and Modes
A5 - Allocation/Budgeting*

Attributes Associated with System Verification & System Validation

A6 - System Verification or System Validation Success Criteria*
A7 - System Verification or System Validation Strategy*
A8 - System Verification or System Validation Method*
A9 - System Verification or System Validation Responsible Organization*
A10 - System Verification or System Validation Level
A11 - System Verification or System Validation Phase
A12 - Condition of Use
A13 -System Verification or System Validation Results
A14 -System Verification or System Validation Status

Attributes to Help Maintain the Requirements

A15 - Unique Identifier*
A16- Unique Name
A17 - Originator/Author*
A18 - Date Requirement Entered
A19- Owner*
A20 – Stakeholders
A21 - Change Board
A22 - Change Proposed
A23 - Version Number
A24 - Approval Date
A25 - Date of Last Change
A26 - Stability/Volatility
A27 - Responsible Person
A28 - Need or Requirement Verification Status*
A29 - Need or Requirement Validation Status*
A30 - Status of the Need or Requirement
A31 - Status (of Implementation)
A32 - Trace to Interface Definition
A33 - Trace to Dependent Peer Requirements
A34 - Priority*
A35 - Criticality or Essentiality*
A36 - Risk (of Implementation) *
A37 - Risk (Mitigation)
A38 - Key Driving Need or Requirement (KDN/KDR)
A39 - Additional Comments
A40 - Type/Category

Attributes to Show Applicability and Allow Reuse

A41- Applicability
A42 - Region
A43 - Country
A44 - State/Province
A45 - Market Segment
A46 - Business Unit

Attributes to Aid in Product Line Management

A47 – Product Line
A48 - Product Line Common Needs and Requirements
A49 - Product Line Variant Needs and Requirements

			Characteristics for Individual needs and requirements									Characteristics for Sets of needs requirements					
			Necessary	Appropriate	Unambiguous	Complete	Singular	Feasible	Verifiable	Correct	Conforming	Complete	Consistent	Feasible	Comprehensible	Able to be validated	Correct
Quality Focus	Rule	Subject	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
Accuracy	R1	Structured Statements			X	X			X	X	X						
	R2	Active Voice		X	X	X			X								
	R3	Appropriate Subject-Verb		X	X				X			X				X	
	R4	Defined Terms			X				X				X		X	X	X
	R5	Definite Articles			X				X								
	R6	Common Units of Measure			X	X			X	X							
	R7	Vague Terms			X	X			X								
	R8	Escape Clauses			X				X								
	R9	Open-ended Clauses			X	X	X		X								
Concision	R10	Superfluous infinitives			X				X								
	R11	Separate Clauses			X	X			X	X							
Non-ambiguity	R12	Correct Grammar			X				X	X	X						
	R13	Correct Spelling			X				X								
	R14	Correct Condition			X					X							
	R15	Logical Expressions			X				X								
	R16	Use of "Not"			X				X	X							
	R17	Use of Oblique Symbol			X				X								
Singularity	R18	Single-thought Sentence			X		X		X		X				X		
	R19	Combinators			X		X										
	R20	Purpose Phrases	X				X										
	R21	Parentheses					X										

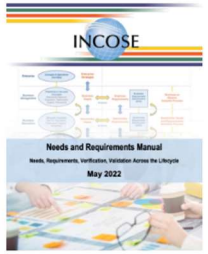
(includes the matrices)

RWG Products Are in the INCOSE Store!

- RWG Products are available in the INCOSE Store!
- Free to INCOSE members
- All are encouraged to download and start using, feedback is welcome!

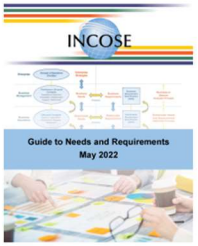
Integrated Data as a Foundation of SE (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 0.00 USD



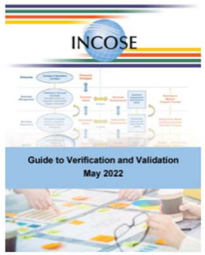
Needs and Requirements Manual (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 35.00 USD



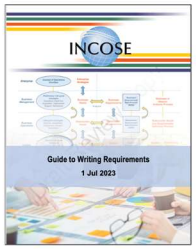
Guide to Needs and Requirements (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 25.00 USD



Guide to Verification and Validation (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 25.00 USD



Guide to Writing Requirements (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 25.00 USD

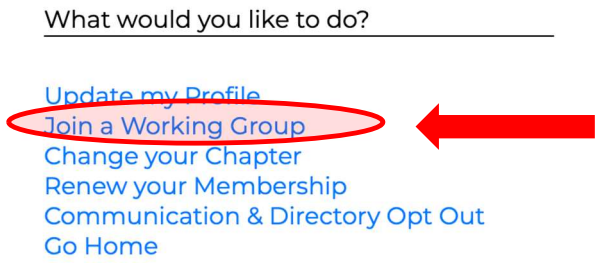
Guide to Writing Requirements Summary Sheet (Soft Copy)

Member Price: 0.00 USD
Non-Member Price: 0.00 USD

How to Become Involved in RWG

- As a large working group, the RWG has been very active in virtual events as well as smaller project team efforts.
- Joining the RWG enables the members to learn about the products, provide an opportunity to contribute to product development, and participate in the RWG virtual events with other practitioners.
- Members can be very involved (product support), involved in our monthly meetings, or minimally involved (view Viva Engage conversations or watch meeting recordings) - the intention is to enable all levels of participation and interaction.

Make sure to update your communications preferences to opt in to receive emails from the WGs!



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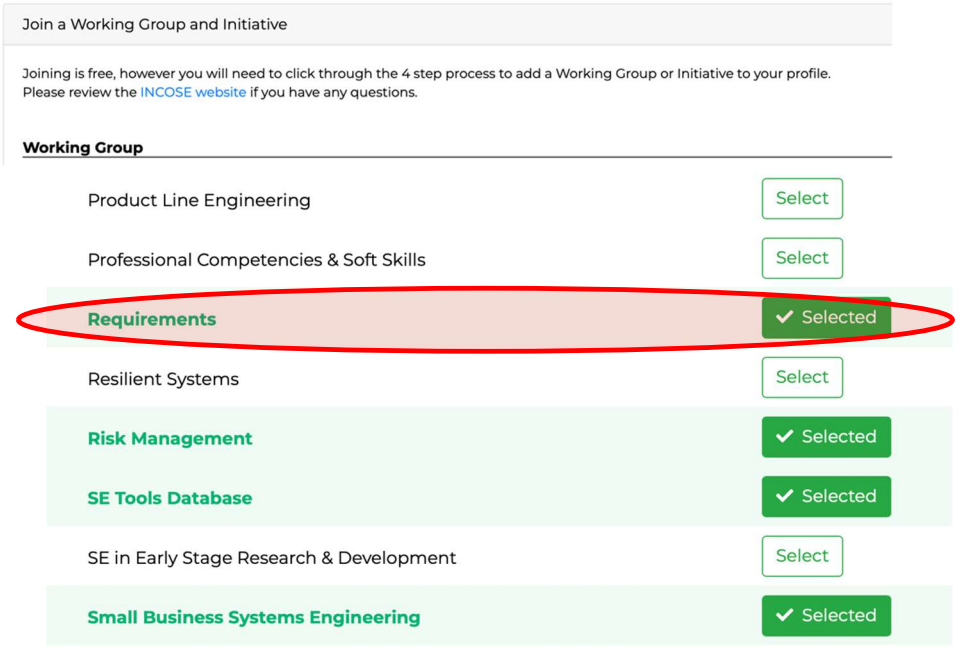


INCOSE

Requirements Working Group

RWG 2024/2025 Activities

2024 Changes

- New RWG organization – to expand opportunities for engagement.
  - Chair and co-chairs
  - Third level of project managers
    - Members can propose projects (writing a paper and/or developing a new Guide).
- Addressing time zone issues with a worldwide membership.
  - Started to having our monthly meetings scheduled twice to better meet the needs of our worldwide membership.
    - 11 am CT US and 4 pm CT US

2024/2025 Activities

- Publish Needs and Requirements Manual (V2)
- Update the GtNR & GtVV (Volunteers needed)
- New Presentations (Lou Wheatcraft)
- Monthly Meetings (Kevin Orr)
- Collaboration with other WGs
- SEBoK Updates (Tami Katz)
- *Webpage Updates - Learning threads from our YouTube videos (Katarzyna Kot)
- *Guide to Model-based Needs and Requirements (Jeff Williams)
- *NRM Fundamentals flip cards (Rob Black)

  * Separate Presentations

- Upcoming Projects (preliminary - to be discussed at IW2025).
  - Guide to Agile Needs and Requirements (Katarzyna Kot)
  - Guide to Embedded Software Needs and Requirements (Lou Wheatcraft)
  - Other guides based on member interests and needs.

Future Projects

- We ask all members to identify the need:
  - For further elaboration or application guidance of any of the concepts and activities in the NRM or other products
  - To tailor the concepts and activities in the NRM to specific domains.
    - Often the intent is the same, but many domains use specific terminology that is different than that used in the RWG products.
    - Need a “decoder ring” to align terminology and activities.

New Presentations

- New presentations to fill in the gaps.
  - Lou Wheatcraft: Needs and Requirements Manual Section 14 "*Needs, Requirements, Verification, & Validation Management*." Presented to the INCOSE Canada Chapter May 29, 2024
  - Lou Wheatcraft: "*Verification and Validation Across the Lifecycle*", presented to the INCOSE LA Chapter June 11, 2024

RWG Monthly Meetings (Kevin Orr)

- **January**: IW 2024
- **February:** RWG IW 2024 Recap
- **March:** Carlo Leardi: “Managing “Tough” Requirements.”
- **April:** Jeff Williams: “Overview of the Guide to Model-based Needs and Requirements.”
- **June:** Katarzyna Kot: “Preventing the labor of Sisyphus - learning about and from the RWG products made easy.”
- **June:** Sarah Vazquez: “Terrible Requirements.”
- **July:** IS2024 – This session
- **August:** Henrik Mattfolk: “A Job Centric Approach To Validating Your System Design.”
- **September:** TBD
- **October:** TBD
- **November:** TBD

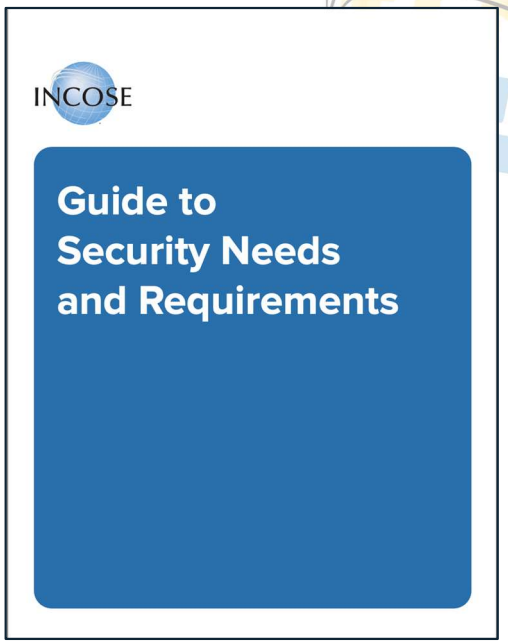
Future RWG Sessions

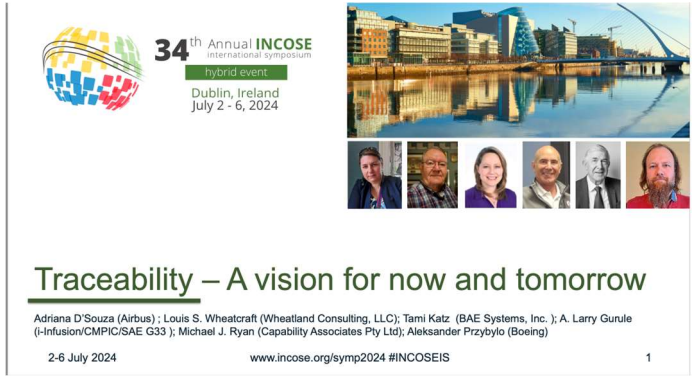
- We have received requests for the following topics to be addressed, we are looking for volunteers to give a presentation on these:
  - Requirements development & management for projects using MBSE.
    - Maybe covered by the work Jeff Williams is doing concerning the Guide to MBSE Needs and Requirements.
    - We plan on having several sessions focusing on this topic in the future.
  - Right sizing requirements management for smaller projects that are heavily governed by codes and standards.
  - How to practically implement requirements management on a new project when the concept development period is often much shorter than ideally required due to past practices.
- Lou Wheatcraft has proposed presentation: “Medical device needs and requirements - integrating the NRM activities with the FDA QMS regulation.”
- Katarzyna Kot proposed presentation: “Guidance on incorporating an RMT for your project based on guidance in the NRM Section 16.”

If you would like to give a presentation or have a topic you would like to be addressed during one of our sessions, let us know.

Collaboration with Other Working Groups

- System Security Engineering (SSE) WG
  - Development of a new “Guide to Security Needs and Requirements” (Beth Wilson)
- System of Systems (SoS) WG
  - Development of a new “Guide to SoS Needs and Requirements” (Beth Wilson)
- Configuration Management (CM) WG
  - Coauthored a paper “Traceability – A vision for now and tomorrow” that was presented at IS2024
- Others??





SEBoK Updates (Tami Katz)

SEBoK Wiki 2.10 was released in early May

- The latest update includes:
  - Significant Part 3 Systems Engineering and Management updates to reflect current practice
    - Renaming of System Life Cycle Models articles to simplify the titles
    - A new Requirements Management article
    - "Business and Mission Analysis" knowledge area renamed to System Concept Definition
    - Updated Business and Mission Analysis article
    - "Stakeholder Needs and Requirements" is now Stakeholder Needs Definition
    - "Stakeholder Requirements Definition" is now System Requirements Definition
    - A new System Architecture Design Definition knowledge area article
    - The System Maintenance knowledge area has been reorganized
  - Minor updates to articles throughout the SEBoK.
  - A new “Get Involved” invitation page including a new SEBoK content review form

RWG Authored

https://sebokwiki.org/

SEBoK Updates

- Goal is to ensure alignment of the SEBoK with the concepts in the NRM and other RWG products.

Stakeholder Needs Definition

System Architecture Design Definition > System Maintenance > System Requirements Definition > Requirements Management > Stakeholder Needs Definition

Lead Author: *Tami Katz,* ***Contributing Authors:*** *Lou Wheatcraft, Mike Ryan*

Stakeholder Needs Definition, the second process in Concept Definition, explores what **capabilities** are needed by various stakeholders for the **system-of-interest** (SoI) to accomplish the mission. The outcome of the Stakeholder Needs Definition process is used as the basis of System Validation, as well as input into the System Requirements Definition process.

Note that the first process, Business or Mission Analysis, is often performed iteratively with Stakeholder Needs Definition to better understand the problem, threat, or opportunity space, as well as options of the solution space.

System Requirements Definition

System Maintenance > System Requirements Definition > Requirements Management > Stakeholder Needs Definition > System Requirements Definition

Lead Author: *Tami Katz* ***Contributing Authors:*** *Lou Wheatcraft, Mike Ryan*

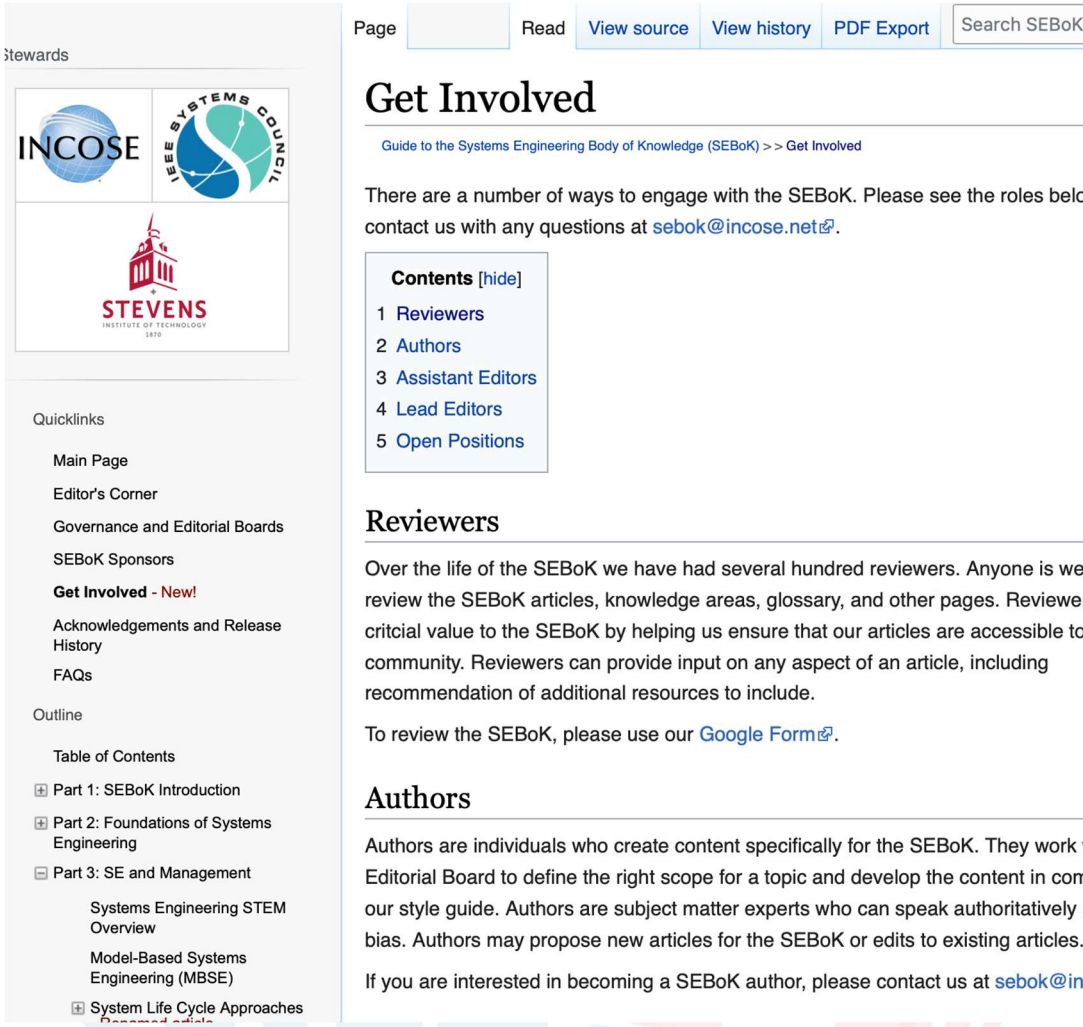
The System Requirements Definition process transforms the **stakeholder** view of desired **capabilities** into a technical, developer view of how the system can achieve those capabilities. **System requirements** describe requirements which the **system-of-interest** (SoI) must fulfill to satisfy the **stakeholder needs** and are expressed in an appropriate combination of well-formed textual statements and supporting models or diagrams. Inputs into this process are the life cycle concepts and integrated set of needs generated during the System Concept Definition activities.

System requirements play major roles in systems engineering, as they:

- Form the basis of system **architecture** and **design** activities.
- Form the basis of system **integration** and **verification** activities.
- Provide a means of communication between the various project team members that interact throughout the project.

Outputs of the System Requirements Definition process serve as inputs to a number of other technical processes, which include System Design Definition, System Architecture Definition, and System Verification.

Get Involved - SEBoK Review and Comment



Stewards

INCOSE | IEEE Systems Council | STEVENS Institute of Technology 1870

Quicklinks

- Main Page
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- Governance and Editorial Boards
- SEBoK Sponsors
- **Get Involved** - New!
- Acknowledgements and Release History
- FAQs

Outline

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- Part 1: SEBoK Introduction
- Part 2: Foundations of Systems Engineering
- Part 3: SE and Management
  - Systems Engineering STEM Overview
  - Model-Based Systems Engineering (MBSE)
  - System Life Cycle Approaches

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Get Involved

Guide to the Systems Engineering Body of Knowledge (SEBoK) > > Get Involved

There are a number of ways to engage with the SEBoK. Please see the roles below and contact us with any questions at sebok@incose.net.

Contents [hide]

1 Reviewers
2 Authors
3 Assistant Editors
4 Lead Editors
5 Open Positions

Reviewers

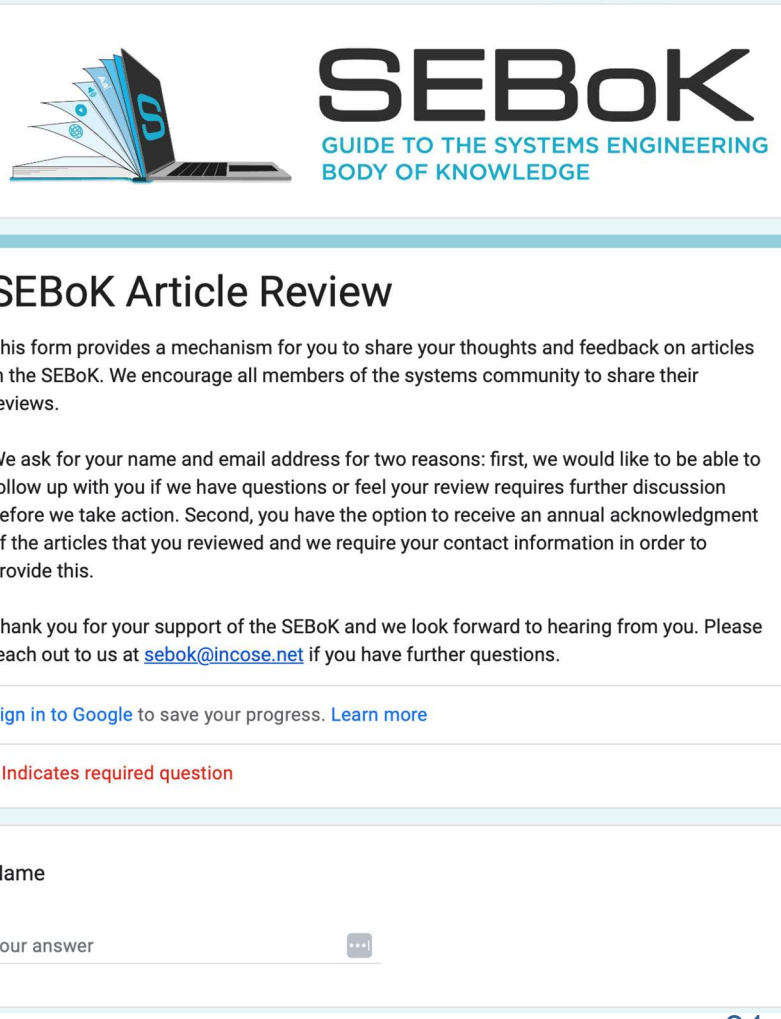
Over the life of the SEBoK we have had several hundred reviewers. Anyone is welcome to review the SEBoK articles, knowledge areas, glossary, and other pages. Reviewers provide critcial value to the SEBoK by helping us ensure that our articles are accessible to the community. Reviewers can provide input on any aspect of an article, including recommendation of additional resources to include.

To review the SEBoK, please use our Google Form.

Authors

Authors are individuals who create content specifically for the SEBoK. They work with the Editorial Board to define the right scope for a topic and develop the content in compliance with our style guide. Authors are subject matter experts who can speak authoritatively and without bias. Authors may propose new articles for the SEBoK or edits to existing articles.

If you are interested in becoming a SEBoK author, please contact us at sebok@incose.net.



SEBoK
GUIDE TO THE SYSTEMS ENGINEERING BODY OF KNOWLEDGE

SEBoK Article Review

This form provides a mechanism for you to share your thoughts and feedback on articles in the SEBoK. We encourage all members of the systems community to share their reviews.

We ask for your name and email address for two reasons: first, we would like to be able to follow up with you if we have questions or feel your review requires further discussion before we take action. Second, you have the option to receive an annual acknowledgment of the articles that you reviewed and we require your contact information in order to provide this.

Thank you for your support of the SEBoK and we look forward to hearing from you. Please reach out to us at sebok@incose.net if you have further questions.

Sign in to Google to save your progress. Learn more

* Indicates required question

Name

Your answer

Questions and Discussion

Agenda

Time (CT USA)	Time (IST- Dublin)	Topic
09:30-9:45	15:30-15:45	Welcome, RWG Introductions (Katarzyna Kot)
9:45-10:15	15:45-16:15	RWG Overview, Status, Plans (Lou Wheatcraft)
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34th Annual INCOSE international symposium

hybrid event

Dublin, Ireland
July 2 - 6, 2024

Requirements Working Group