



34th Annual **INCOSE**
international symposium
hybrid event

Dublin, Ireland
July 2 - 6, 2024



International Council on Systems Engineering
A better world through a systems approach



Requirements Working Group

Needs & Requirements Fundamentals



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Chartered Manager and Fellow, Certified Systems and Requirements Engineer. Developing people, process, and systems to satisfy business, mission, and life cycle stakeholder needs in UK Nuclear.

2-6 July 2024

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Agenda



Context



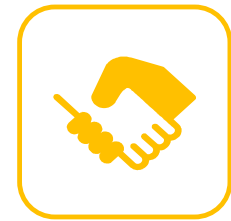
Reflection



Inspiration



Proposal



Discussion

2-6 July 2024

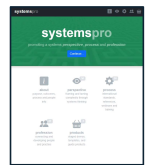
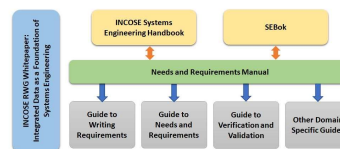
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Context

- **Notice of June RWG meeting...**
 - *Topic: “Preventing the labor of Sisyphus...RWG products made easy”*
 - “...Requirements Working Group (RWG) has developed many products and materials... In 2024, we started a project to consolidate and organize the available materials into easy-to-find and easy-to-use (knowledge) nuggets... During this session, we would like to receive your feedback on what you need to either learn about the RWG products, or extend your knowledge based on their contents.
 - *Recognised that we could and should do more to help general accessibility*
- **Personal experience...**
 - CMgr FCMI, CSEP MINCOSE, CPRE IREB, APM-PMQ
 - INCOSE UKAB, North West Local Group Chair, Certification Application Reviewer
 - 20 years leading people, process, and systems improvements in UK Nuclear Decommissioning
 - Subject Matter Expert and SL-INCOSE CPD programme lead (200+ people / 9 cohorts).
 - Experience of drafting comms and educational materials related to above.



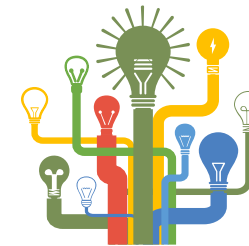
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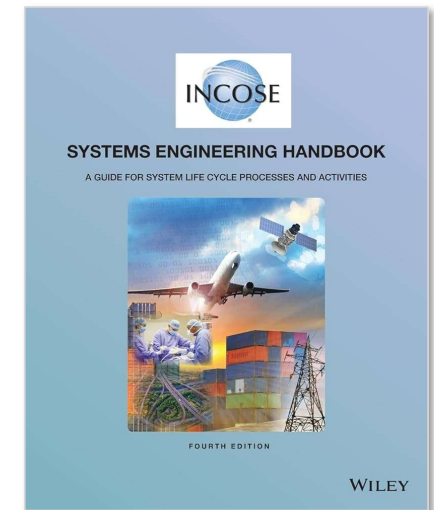
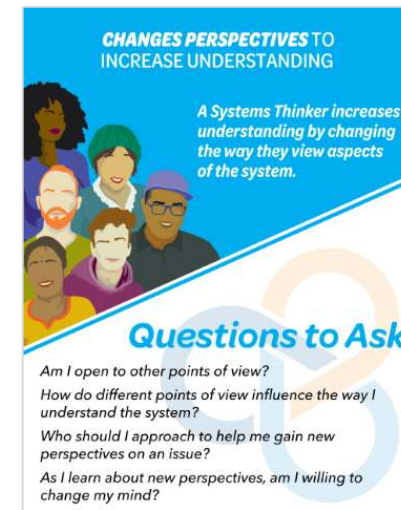
Reflection

- Q)** Have you read and digested the INCOSE Needs and Requirements Manual (NRM)?
- Q)** What key concepts and prompts could you quickly recall and communicate that would benefit others?
- Q)** Can we create a more accessible digest?



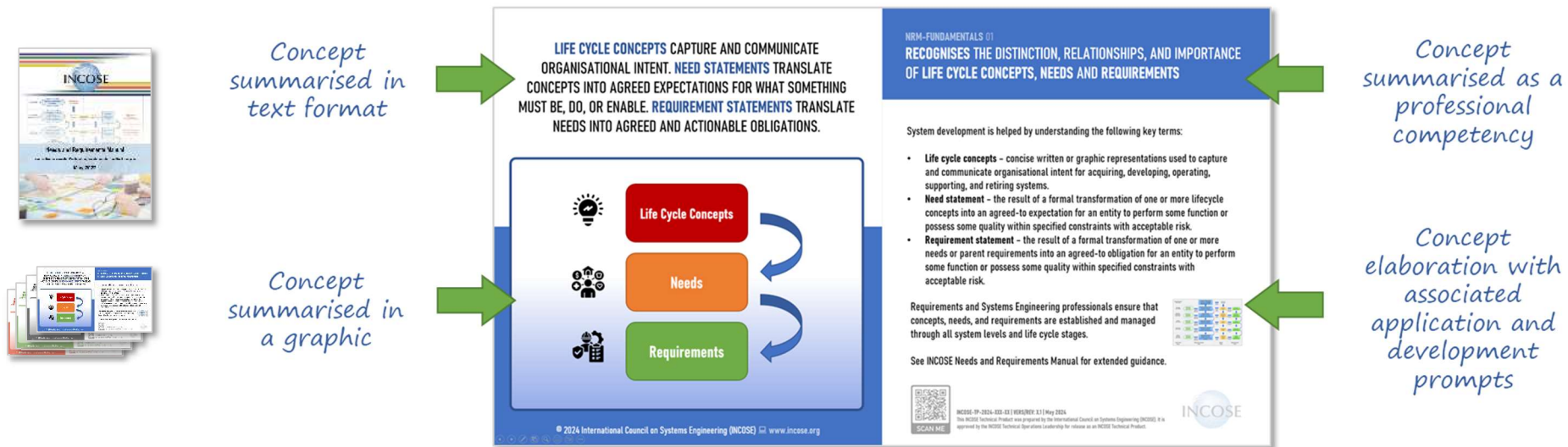
Inspiration

- See Waters Centre for Systems Thinking
- Systems Thinking Habits – as enumerated in INCOSE SEH (v4)
- Flip cards convey essential habits, associated application, and development prompts



NRM Fundamentals – Proposal Overview

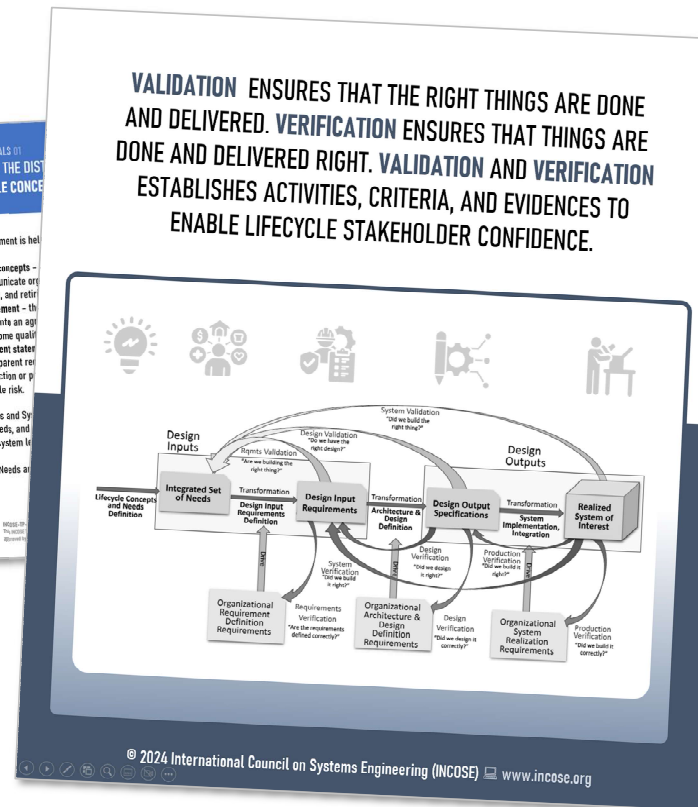
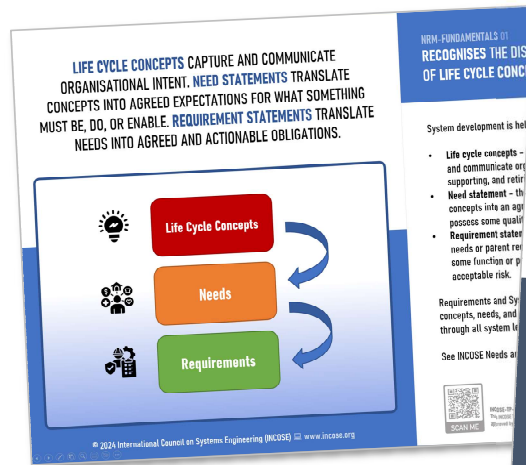
- Elicit key concepts and associated application prompts from RWG NRM.
- Develop and publish flip-card summaries to help general accessibility.



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NRM Fundamentals – Illustrations



**NRM-FUNDAMENTALS 02
RECOGNISES THE DISTINCTION, RELATIONSHIPS, AND IMPORTANCE OF VERIFICATION AND VALIDATION**

System development is helped by understanding the following key terms in context:

	Validation Ensures the right things are done and delivered	Verification Ensures things are done and delivered right
Concept	Do concepts reflect stakeholder intent?	Are concepts written correctly?
Needs	Do needs reflect lifecycle concepts?	Are needs written correctly?
Requirements	Do requirements reflect needs?	Are requirements defined correctly?
Design	Do designs reflect requirements?	Did we design it correctly?
System	Does the system enable stakeholder intent?	Did we build it correctly?

Validation ensures that the right things are done and delivered through life cycle stages, processes, and products. **Verification** ensures that things are done and delivered correctly with reference to encompassing designs, requirements, needs, concepts, and all relevant organisational and international standards.

Requirements and Systems Engineering professionals recognise the importance of early **validation** and **verification** planning in systems development and tailor activities relative to life cycle complexity, cost, and risk. See INCUSE Needs and Requirements Manual for extended guidance.

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NRM Fundamentals – Draft List

- 01 - Recognises the distinction, relationships, and importance of life cycle concepts, needs and requirements (*illustrated in previous slides*)
- 02 - Recognises the distinction, relationships, and importance of verification and validation (*illustrated in previous slides*)
- 03 - Recognises the importance of, and key-enablers to, an integrated, collaborative project team
- 04 - Recognises the importance and key-enablers to effective communications
- 05 - Recognise the distinction of, and paired approaches required for, green field and brown field systems
- 06 - Recognises the importance of, and key-enablers for, avoiding technical debt
- 07 - Recognises the value of, and key enablers for, implementing an information-based needs and requirements definition and management (I-NRDM) approach
- 08 - Recognises the dynamic context of concepts, needs, and requirements management (*c.f. change, traceability*)
- 09 - Recognises the importance of, and key enablers for, identifying, engaging, and managing life cycle stakeholders
- 10 - Recognises the importance of defining and managing systems context and associated interfaces
- 11 - Recognises the importance of defining and managing risk
- 12 - Recognises the value and application of functional analysis (*c.f. SIPOC, fundamental system model etc*)
- 13 - Recognises the importance and key-enablers for effective Needs, Requirements, Verification, and Validation Management (NRVVM) planning

NRM Fundamentals – Status

- RWG Lead Team engagement ✓
- Proposed INCOSE UK NW LG collaboration spin-off (x8 volunteers)
- Wider interest and support welcome



RB-Led Team

1. RWG Lead Team liaison

- NRM Fundamentals proposal approval
- Agree NRM Fundamentals scope (see draft list slide)
- Provide progress updates as may be required
- Submit draft product and manage any revisions / updates as directed

2. Project team build and technical mgt through development

- Identify, engage, and oversee a small team of industry colleague volunteers
- Allocate NRM Fundamentals to volunteers for individual card development
- Plan, track, collate, and moderate volunteer contributions through to consolidated draft product, ensuring NRM correspondence, consistent structure, format, voicing etc.

RWG Lead Team

1. Volunteer nominations

- Invite / suggest RWG Lead Team / other RWG members who may want to contribute to this project (i.e. assignment to pick up 1+ NRM Fundamental for card dev as directed)

2. Technical moderation and approvals

- Approve outline NRM Fundamentals proposal
- Agree NRM Fundamentals scope (see draft list slide)
- Draft product review and direction on any required revisions
- End-product approval

3. Comms leadership

- Plan and support publication (e.g. executive foreword, digital hosting, printed cards, graphic design review / media support etc)
- Plan, develop, and schedule launch comms
- Consider and lead on allied ideas (e.g. paired YouTube "shorts" to present each NRM fundamental with a voiced perspective on it's significance)



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Discussion & Next Steps

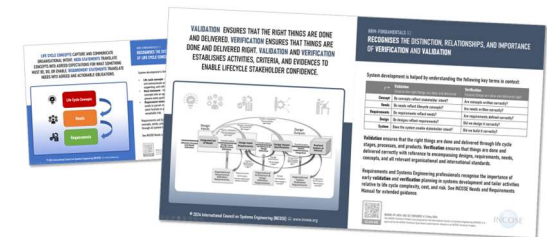
- **NRM Fundamentals will communicate key concepts and application prompts via accessible summary references helping to drive awareness and practice improvements across industry.**
- Proposed July / August kick-off meeting with project volunteers to communicate expectations and arrangements.
- RB-RWG Lead Team liaison to continue through Technical Product Proposal (TPP) and product development.

- **Q) What do you think?**
- **Q) Would you like to help?**

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12 - Recognises the value and application of functional analysis (i.e. SPQR, fundamental system model etc)
13 - Recognises the importance and key-enablers for effective Needs, Requirements, Verification, and Validation Management (NRV/V) planning



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Thanks!



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