# Module 7: The Requirements State
# Session 1 of 7

Rev 4.0.1



# Objectives

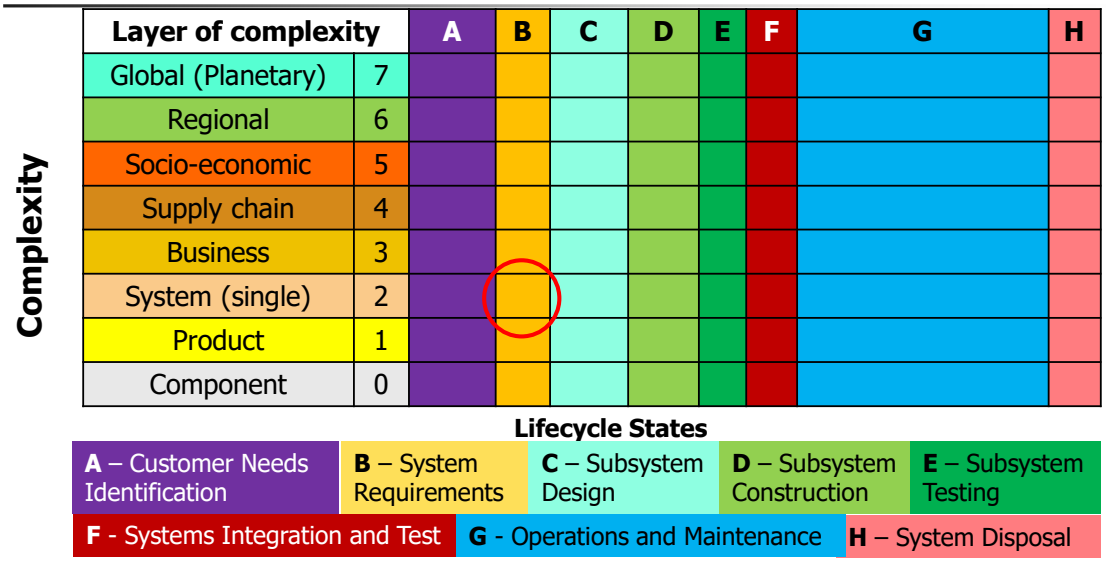
1. To identify the role of systems engineers in the requirements state of the system lifecycle
2. To identify the nature of the problems they face
3. To introduce some the of the tools, methodologies and techniques available to solve those problems

# Knowledge

- Lecture
  - Sets the context
- Readings/videos
  - Listed in the session
- References (if any)
  - Provided in the session
- Exercises
  - In the session

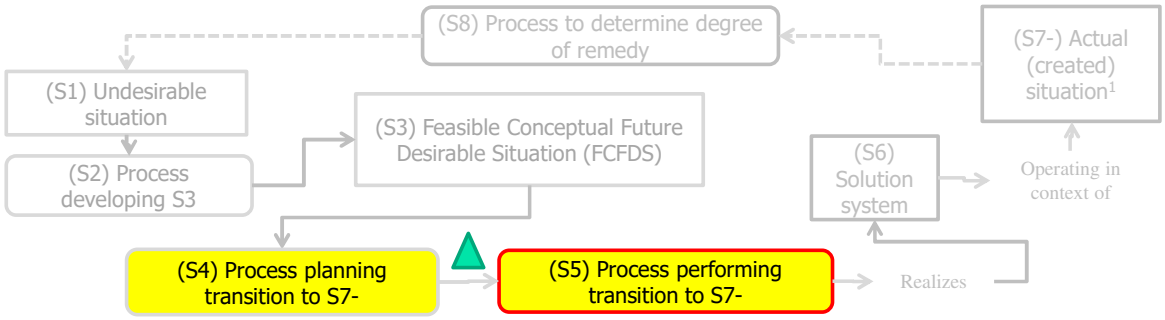


# Big Picture



# The Nine-System model (Functional view)

The realization states






# Contents of module

1. The critical applied systems engineering tasks which systems and software engineers must perform in the system requirements state
2. A little-known way to capture poor requirements and convert them into well-written requirements
3. An improved template for a requirement statement
4. How to convert stakeholder needs into good requirements using some systems thinking tools
5. How to minimize missing requirements using a mixture of generic and specific requirements
6. Why a requirement must be more than just the statement, 'the system shall'
7. Where and how requirements are used in the systems development process and some of the consequences of poorly written requirements

# The sessions

- Session 2: WGR Module 6: Converting stakeholder needs to requirements
- Session 3: WGR Module 7: Converting requirements to well-written requirements
- Session 4: WGR Module 8: Converting well-written requirements to good requirements
- Session 5: WGR Module 9: The use of requirements in the rest of the system development process
- Session 6: An introduction to the systems approach to project planning
- Session 7: The Pentagon Wars case study



# Role of the systems engineer

- Ensure system and subsystem requirements are good requirements
  - *Contain the attributes discussed in the Writing Good Requirement sessions*
- Identify appropriate standards and regulations
- If project starts in HKM$^2$F Column B [B paradigm]
  - Elicit and elucidate requirements
  - Create operational model of system mission and support activities
  - Perform feasibility analyses on requirement requests
  - Perform sensitivity analyses on requirement requests

# Framing the problem

1. Undesirable situation (at start of state)
   1. Lack of complete set of good matched specifications
   2. Lack of detailed strategies and plans to implement
2. Assumptions
   1. The quality of the requirements are unknown
3. FCFDS (at end of state)
   1. A complete set of matched good specifications for the system (S6)
   2. Strategies and plans for the process to implement the system (S6)
4. Problem
   1. How to produce the documents in the FCFDS
5. Solution
   1. TBD using applied systems engineering in HKM$^2$F Column B



# Any questions ?