Headquarters U.S. Air Force

Integrity - Service - Excellence

Status of USAF Systems Engineering

Mr. Terry Jaggers, SES
Deputy Assistant Secretary
Science, Technology, & Engineering

23 Oct 2007

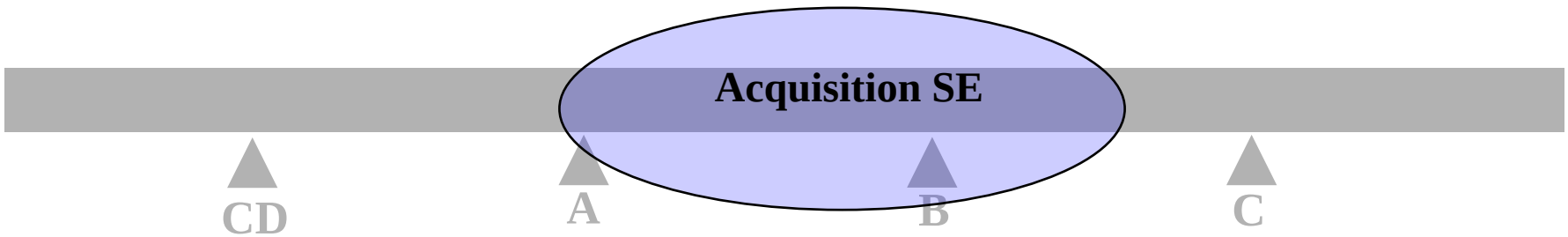
What We've Done…

- Published AFI 63-1201, Life Cycle Systems Engineering (LCSE) -- first AF policy for SE
- Published AFMCI 63-1201, OSS&E and Systems Engineering Life Cycle Management
- Life Cycle SE initiatives pushed into all AFSO21 initiatives for which SE is a key enabling process
- Created Unit Compliance Inspection (UCI) checklist for SE at AFMC
- Creating integrated Weapon System Integrity Program to ensure cohesive SE effort with all integrity programs
- Developing AFMC-wide Risk Management Tool pilot
- Begun insertion of SE practices into Probability of Program Success (PoPS) management tool
- In final steps of ensuring 100% SEP compliance across all air and space ACAT programs to meet SECAF direction
- Increased workforce participation in SE graduate education and distance learning programs
- Completed National Research Council (NRC) study on early SE
- Funded SMC pilot project to develop and validate process documentation -- report ECD Nov 07

Where We're Going…

- **Developing a Corporate AF SE Assessment Module to support core SE attributes across both AFSPC and AFMC – process areas, process area goals, practices, and evidence**
- **Including an AFIT SE Masters' Degree program in Civilian Developmental Education**
- **Investigating governance framework for enterprise architecting and system-of-systems (SoS) engineering at CSE**
- **Increasing academic research (in-house & collaborative) at AFIT CSE**
- **Enhancing integration of related specialty areas (software, HSI, manufacturing, etc.) for inclusion in increment 2 of AFI 63-1201**
- **Establishing an AFMC knowledge management toolset or forum to assist programs with issues in planning or executing SE**
- **Preparing a study to review best practices from TRAs, MRAs, IPAs, PSRs, IRTs, etc. as a Corporate AF gold standard for deep dive tech planning reviews**
- **Refining policy, processes, programs and people issues to implement early SE under the Life Cycle Systems Engineering (LCSE) construct**

What is AF Life Cycle Systems Engineering (LCSE)?



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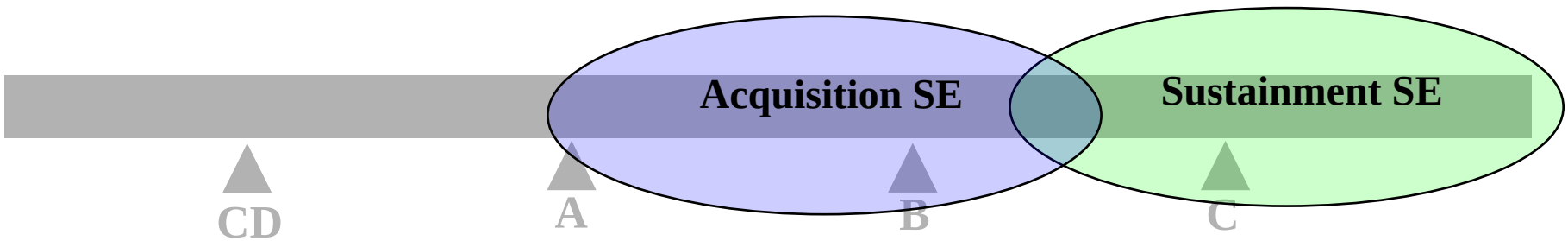

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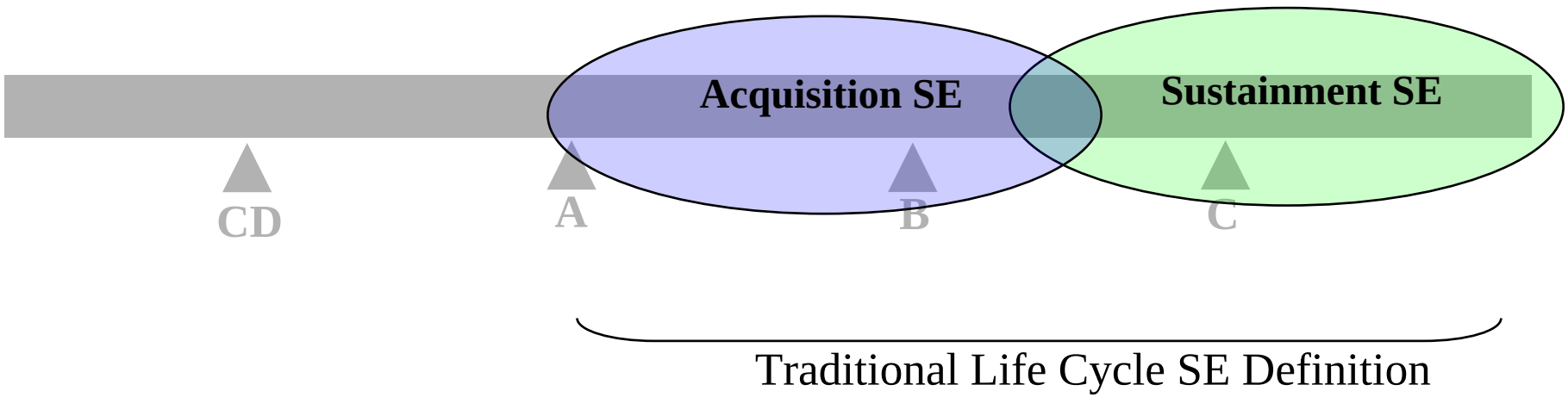

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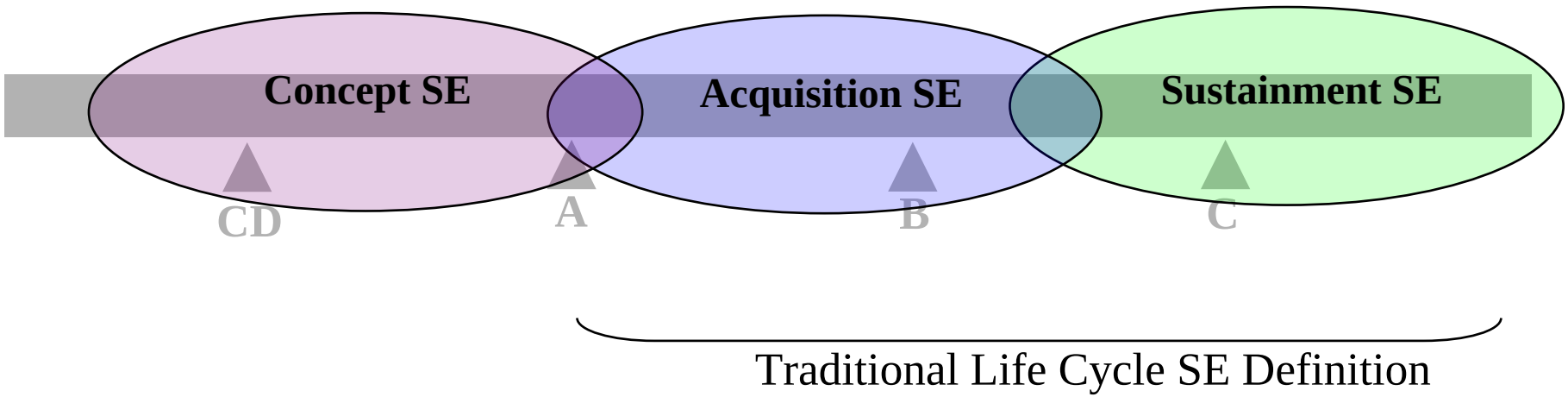

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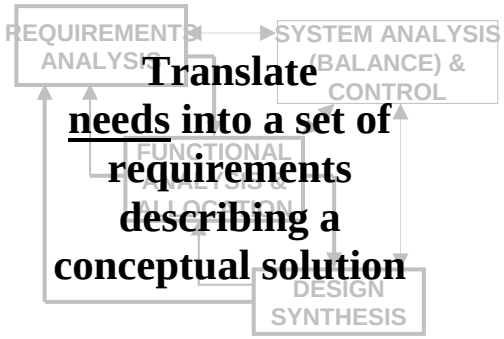
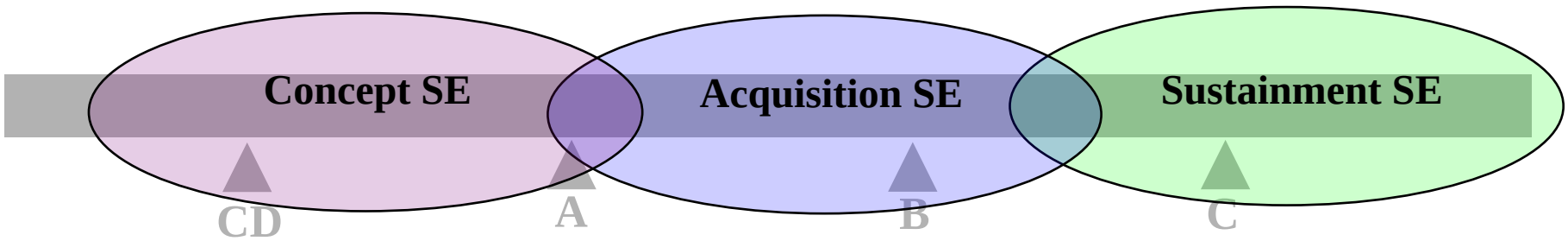


Translate needs into a set of requirements describing a conceptual solution



Traditional Life Cycle SE Definition

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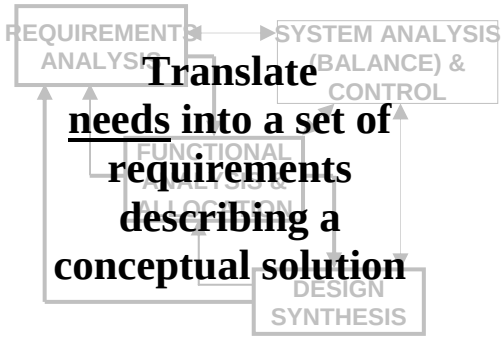

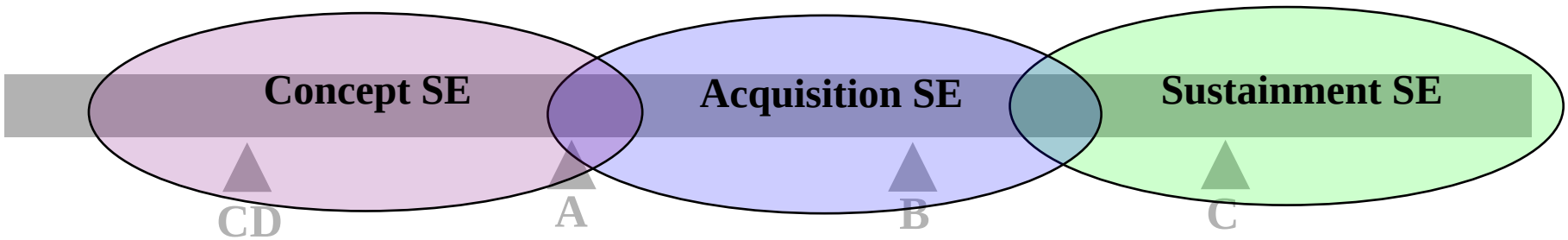

"Early SE"

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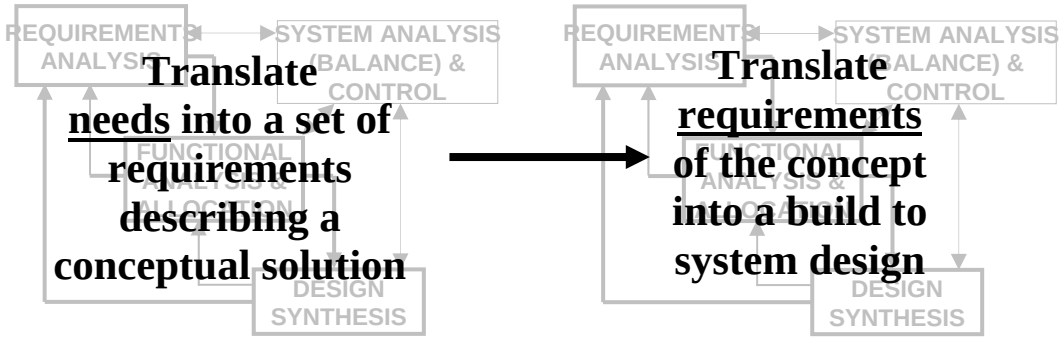

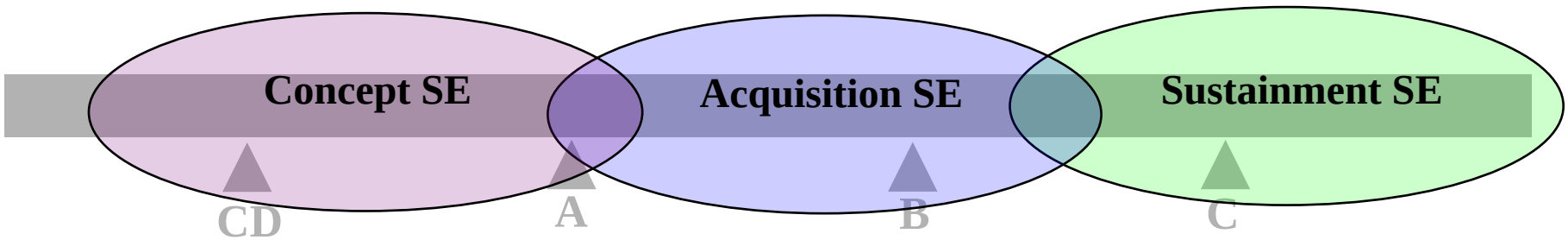

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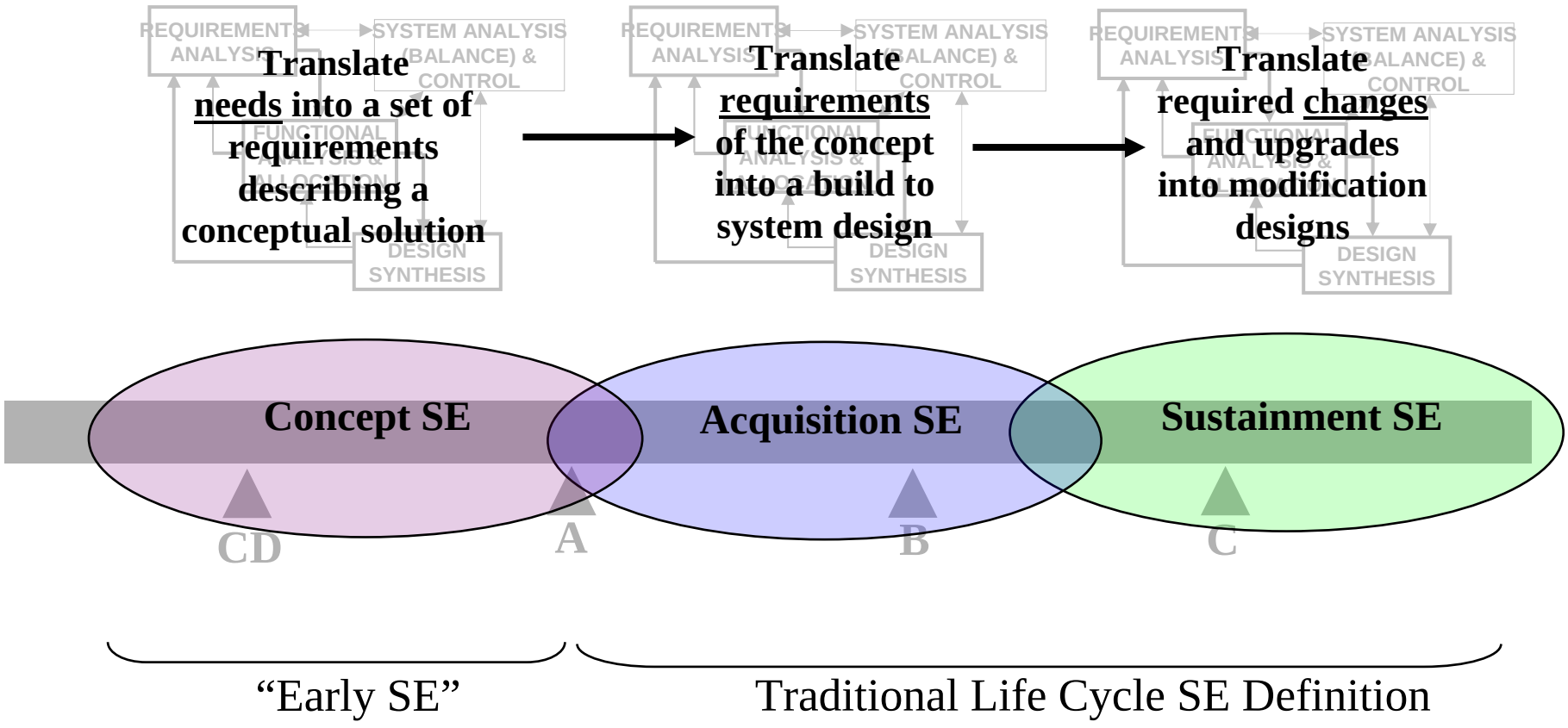

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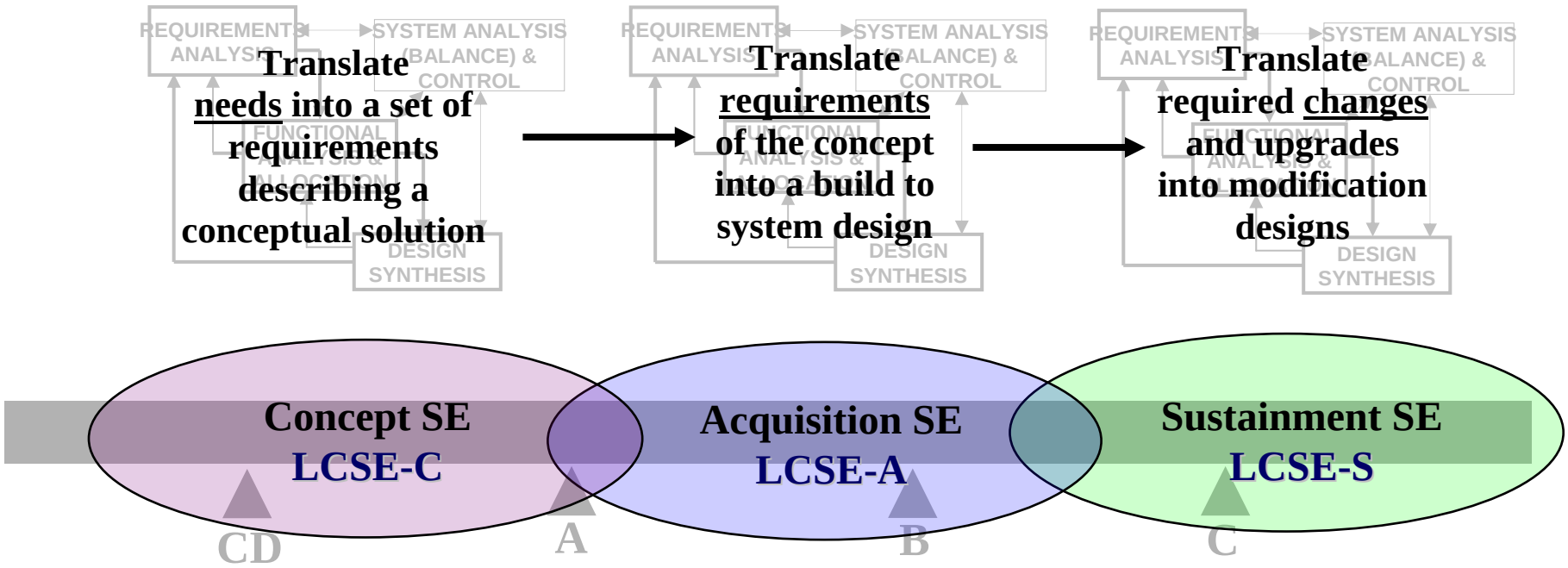

LCSE Defined by Air Force Instruction (AFI 63-1201)

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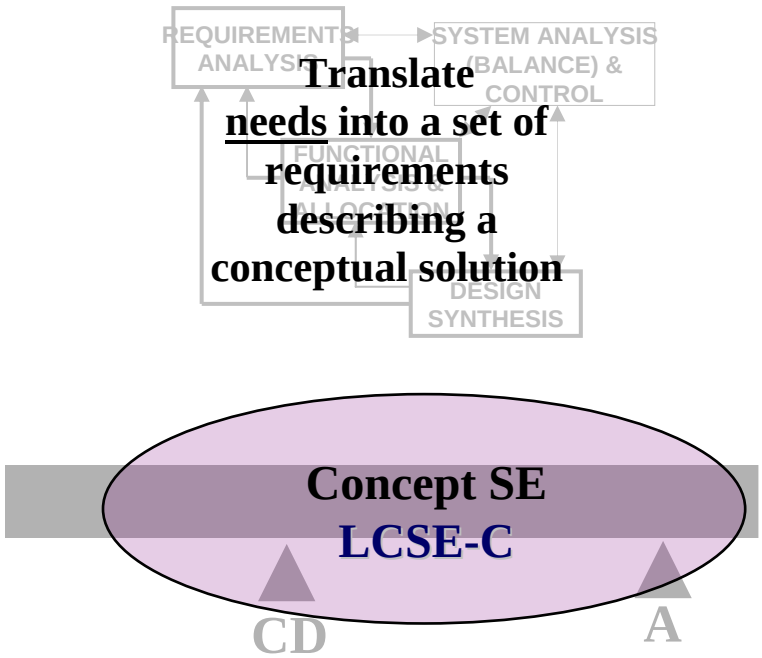

- Like a SEP, the SE process during the LCSE-C phase is governed by a "concept engineering plan" or a (ConSEP)
- Like the System Design Spec, the product of the LCSE-C phase is a concept design or a "concept characterization"
- Like verification of the system design, the concept characterization needs verification & traceability

Early SE leads to better military utility assessments & better life cycle cost estimates, which inform decisions & ultimately lowers risk during acquisition

Early SE Challenges

Policy

- Establishing formal milestones earlier
- Establishing criteria to measure early SE products at these milestones

Process

- Developing ConSEP guides
- Templates for Concept Characterization documents
- Capturing SE content in IT to move forward with programs

Programs

- Institutionalizing funding for consistent SE application
- Placing early concept SE products under configuration control

People

- Identifying early SE expertise & “systems thinkers”
- Ensuring the right balance between engineers & analysts, military & civilian

Summary

- **AF Making Progress in SE Revitalization**
- **AF Will be Resource Constrained in the Future**
- **Early SE Provides Opportunities to the AF**

Pursuing USAF Technical Excellence!

Special Thanks

Col Jim Horejsi

Col Rich White

Maj David Borgeson

1st Lt Steve Dirks

and the SMC Team

Great Work on the Pre-A SE Process (PASEP) Study