

Object-Oriented Systems Engineering Method (OOSEM)

Integrate and Verify System

OOSEM Topics

- OOSEM Overview
- Method
 - Setup Model
 - Analyze Stakeholder Needs
 - Analyze System Requirements
 - Define Logical Architecture
 - Synthesize Candidate Physical Architectures
 - Optimize and Evaluate Alternatives
 - Manage Requirements Traceability
 - **Integrate and Verify System**
- Summary

Module Objectives

- After completion of this module, student should understand
 - The motivation for addressing verification as part of OOSEM
 - The primary modeling artifacts from Integrate and Verify System
 - The key elements of a verification context
 - How to further define a test case
 - How elements of a test plan are captured in the model
 - How OOSEM can be applied to enabling systems

Motivation

- Test program is often a significant contributor to the development schedule and cost
- Improve the effectiveness of the test program and surface verification issues early
 - More verifiable requirements (e.g. reduced ambiguity)
 - Definition of test cases
 - Design for test
 - Architect the verification system
 - More effective testing planning

Integrate and Verify System

- Invoked throughout the development process
 - Verification requirements
 - Test cases
 - Test planning
 - Test procedures
 - Test conduct
 - Test reports

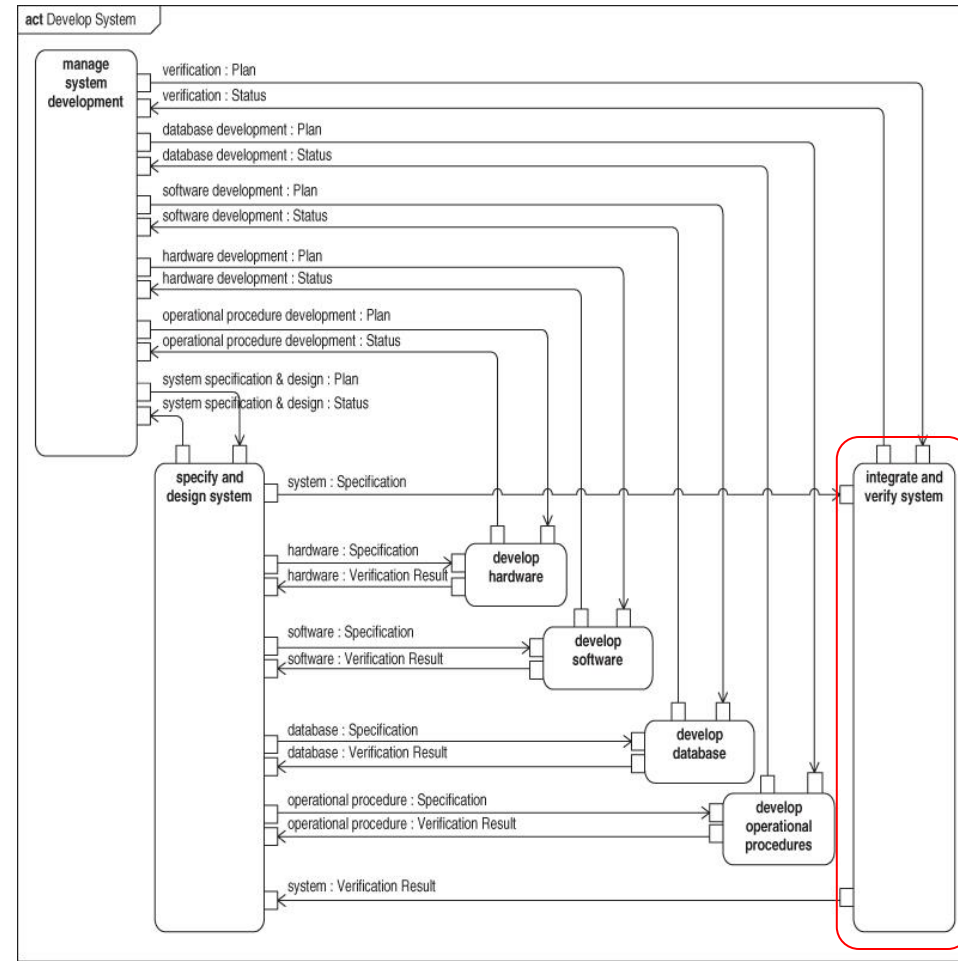
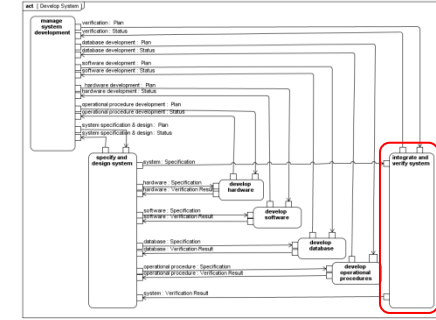


Figure 17.1

Verification Methods

- Verification methods include:
 - Inspection
 - Analysis
 - Demonstration
 - Test



Identifying Test Cases

- A test case verifies one or more requirements

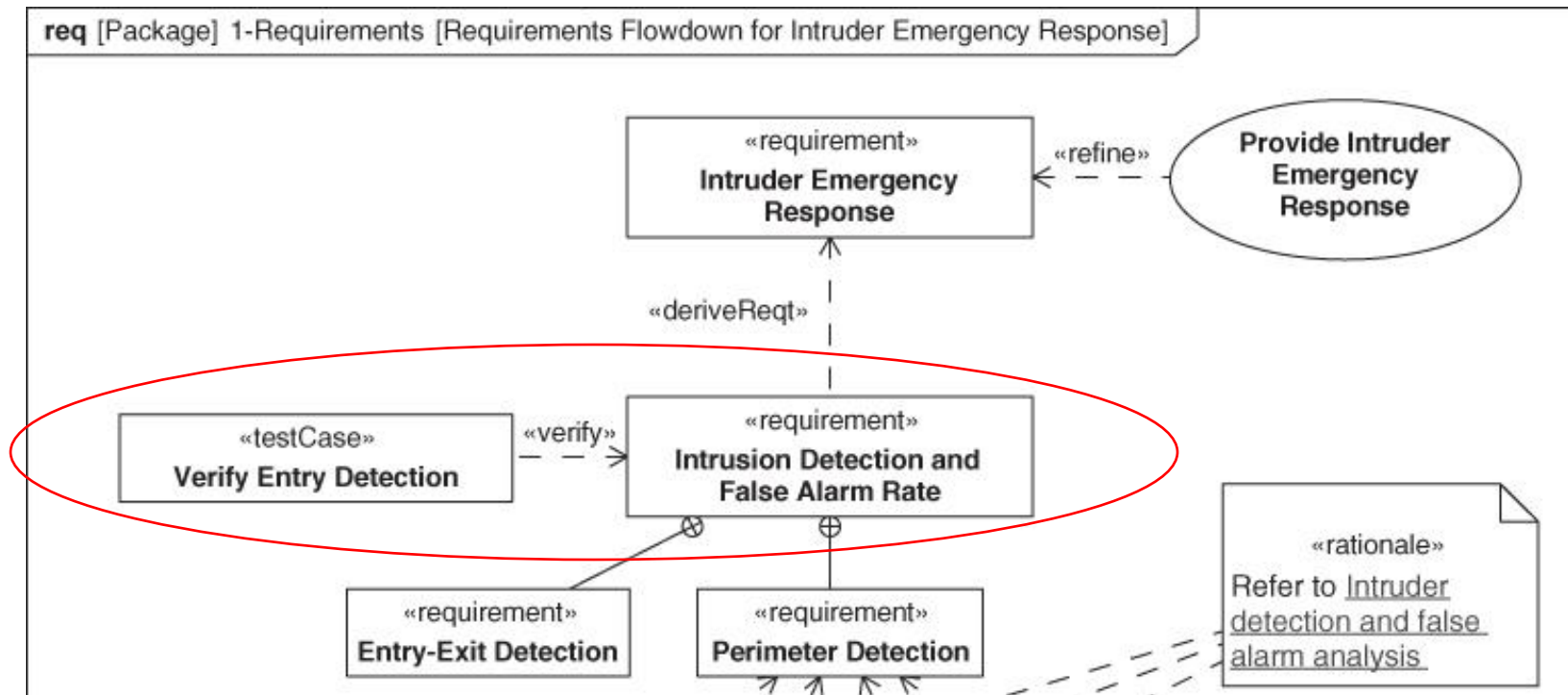
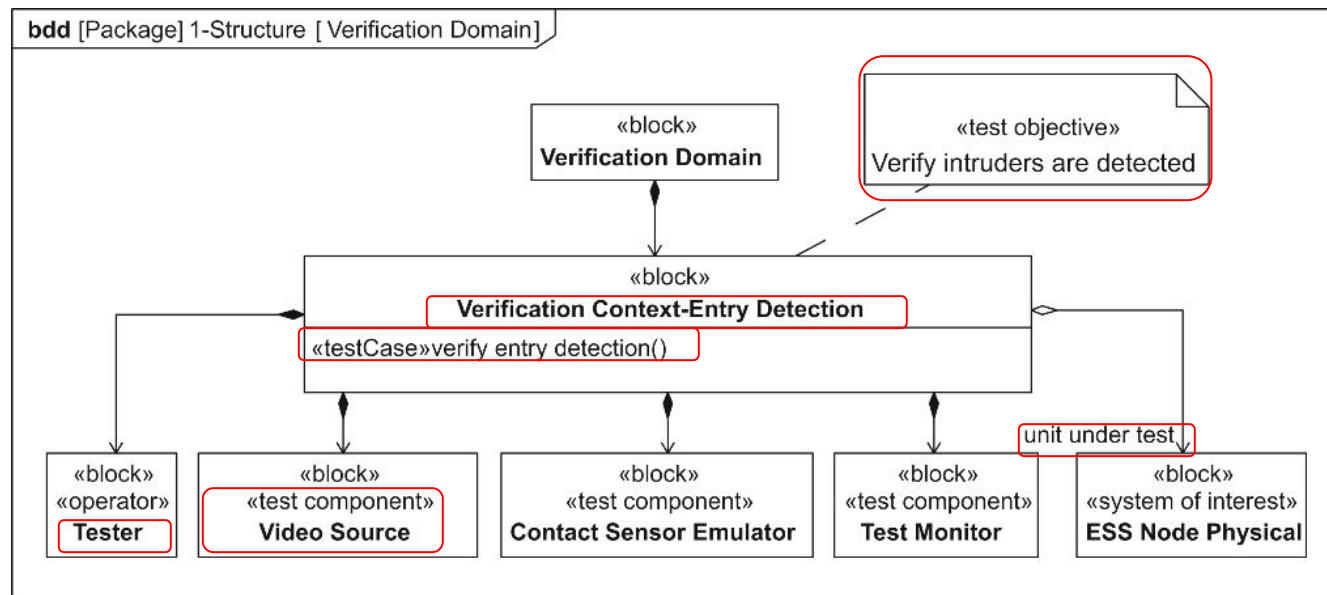


Figure 17.54

Developing a Verification Context

- The test/verification context supports one or more test objectives

- Test case
- Test operator
- Test objectives
- Test component
- Unit under test



Concepts based on
UML Testing Profile

Figure 17.59

Verify Entry Detection Verifiable Requirement

- Specify requirement in terms of the inputs and expected outputs

Inputs			Expected Output
State	Video In	Contact Sensor	Alert Status
Deactivated	Detection=True	Detection=True	FALSE
Activated	Detection=True	Detection=True	TRUE
Activated	Detection=False	Detection=True	TRUE
Activated	Detection=True	Detection=False	FALSE

Defining and Executing Test Cases

- Define test case behavior in activity diagram
- Detailed behavior can be used to define test procedure
- Execute test cases to verify system satisfies requirements

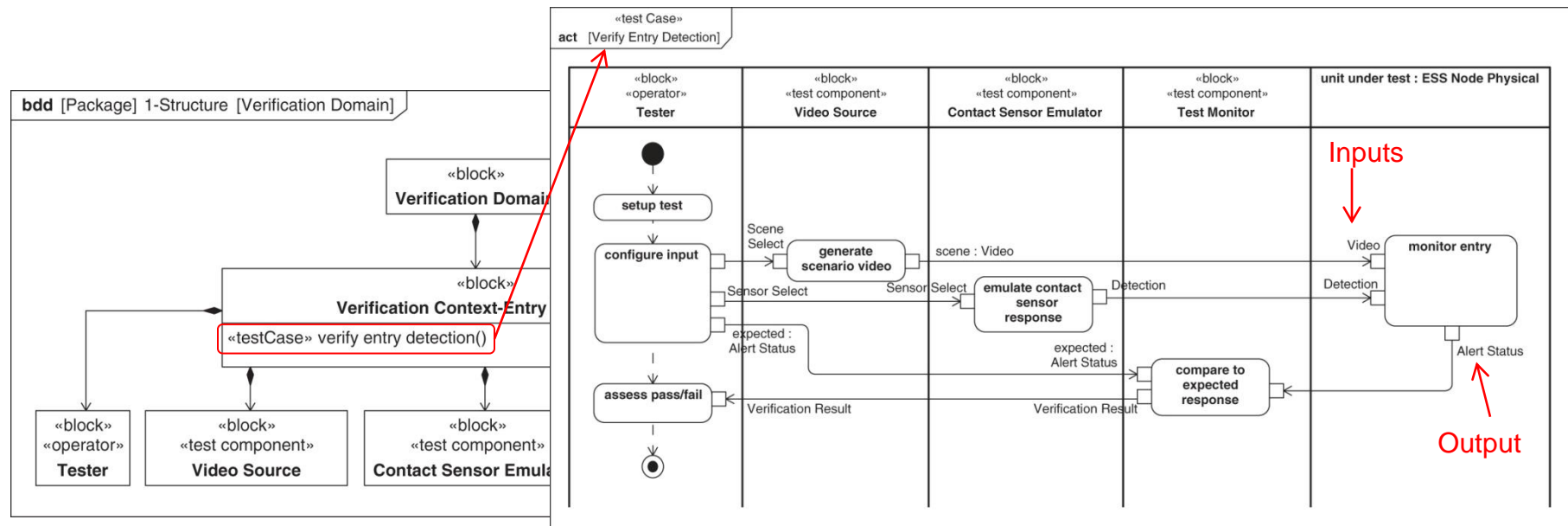
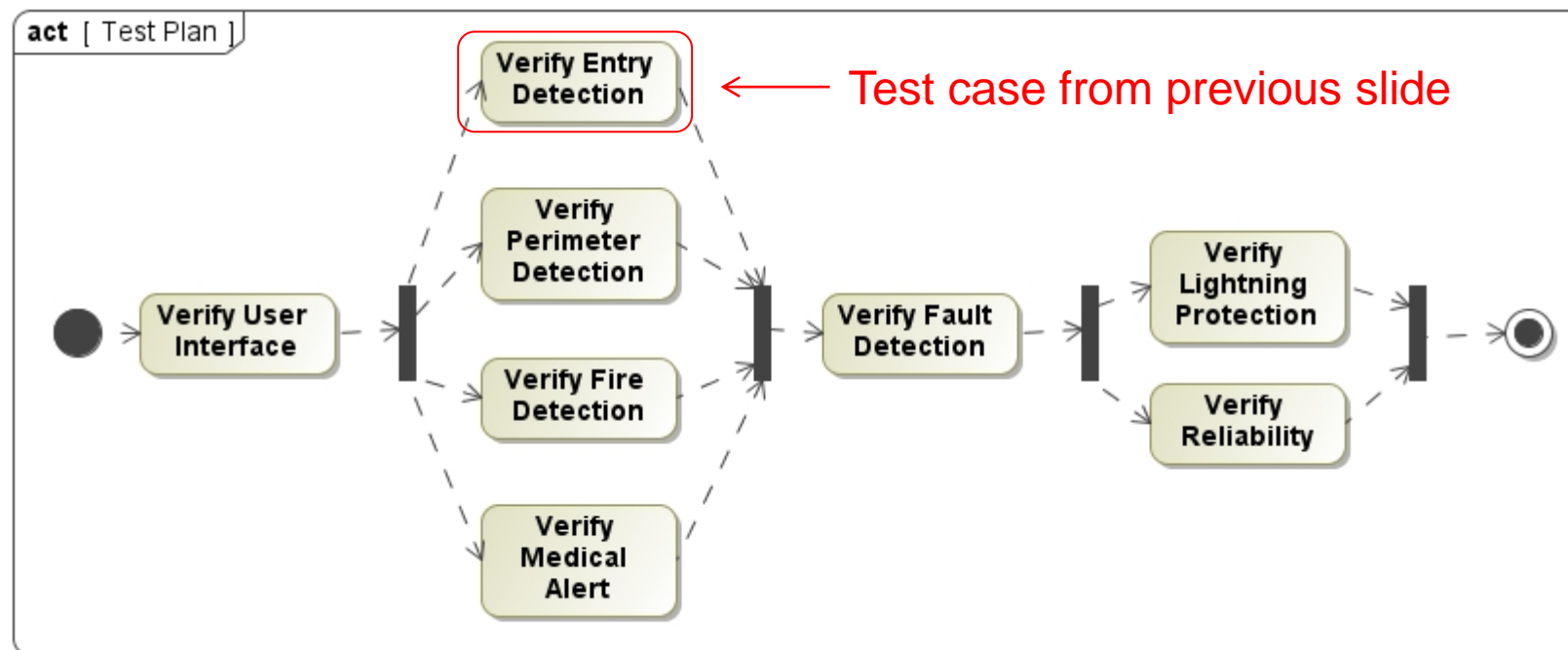


Figure 17.57

Figure 17.55

Test Plan

- Test objectives, test cases, and required resources are captured in verification context
- Sequencing of test cases can be captured in activity diagrams



Applying OOSEM to Enabling Systems

- OOSEM can be applied to develop systems that support the operational system throughout its life cycle
 - Verification system
 - Manufacturing system
 - Installation system
 - Support system
 - ...

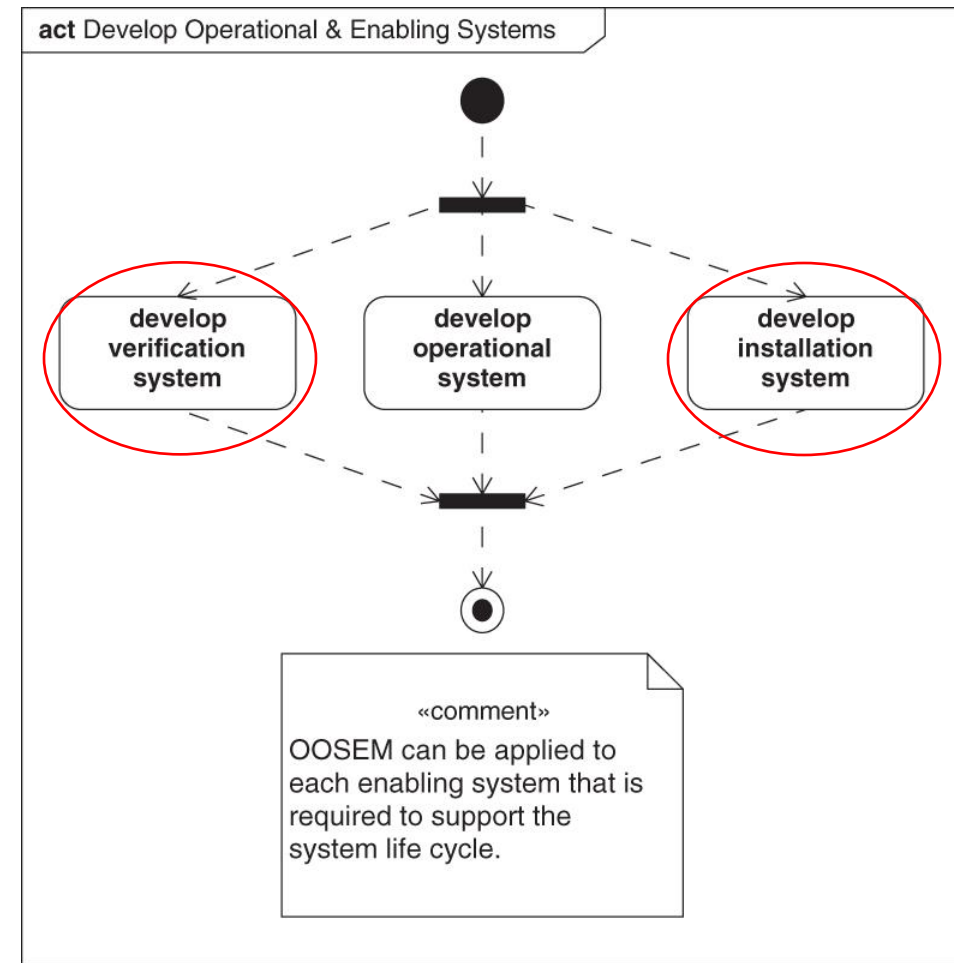


Figure 17.58

Develop Installation System

- Installation Domain Model includes Installation Enterprise & Installation System
- Tailor OOSEM to define the Installation System architecture and specify the components of the architecture

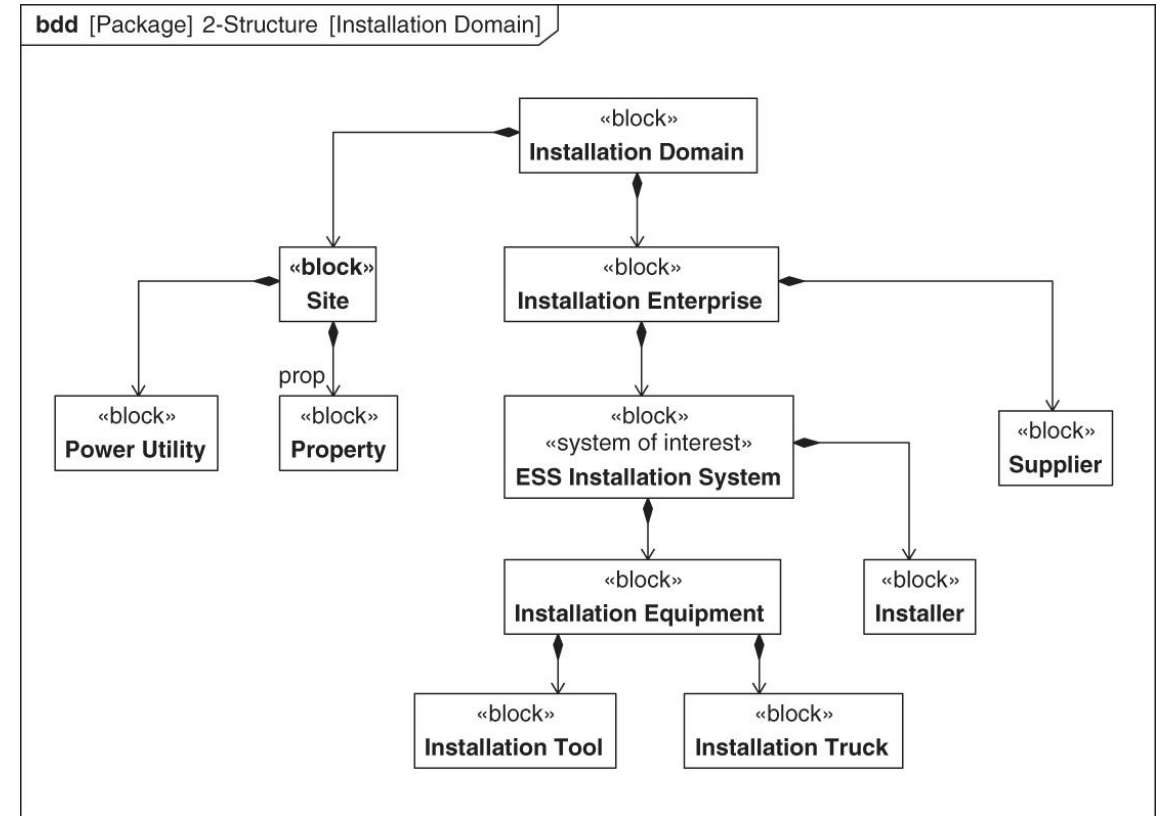


Figure 17.58

Summary

- OOSEM can support a more effective verification program by using the model for test case definition, traceability to requirements, and architecting the test system
- OOSEM can be tailored and applied to enabling systems for each phase of the life cycle