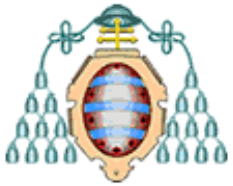
Standarization effort: ISO/IEC 29119 Software Testing

Javier Tuya
Software Engineering Research Group
University of Oviedo
Coordinator of the workgroup
AEN/CTN 71/SC7/GT26 – AENOR



giis.uniovi.es

AST Meeting, Seville, October 19th 2011

What are standards?

- "Set of mandatory requirements established by consensus and maintained by a recognized body to prescribe a disciplined uniform approach or specify a product, that is, mandatory conventions and practices" *(ISO/IEC 24765:2009 Systems and software engineering vocabulary)*
- Standards provide a body of knowledge that provides the basis for a professional discipline
- Basis for:
  - Communication – common terminology
  - Professional qualifications
  - Certification/compliance schemes
  - Benchmark of 'good industry practice'
  - Contracts
  - Interoperability and consistency……

Standards for Software Testing

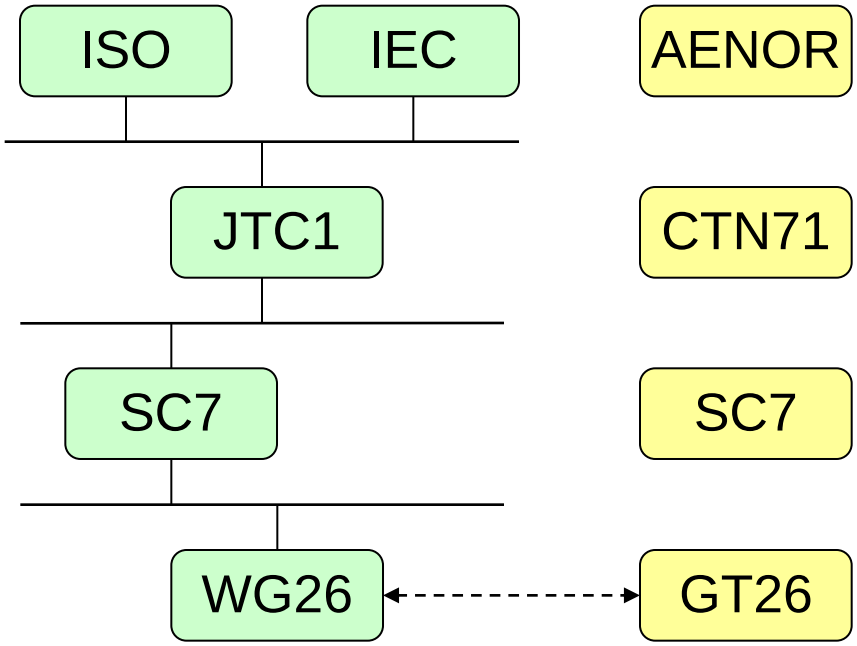
- IEEE & BSI Standards
  - IEEE 829 deals with documentation (implicit process)
  - IEEE 1008 deals with unit testing
  - BS 7925-1 & 2 unit testing standards
- Not covered:
  - Integration testing, system testing, acceptance
  - Explicit test process model
  - Project test management & organization-level
  - Partial view of testing techniques
- Conflicting definitions, processes & procedures
- Practitioners may not know which standard to follow

ISO/IEC 29119 - Scope

- Proposal of 29119 ISO project: February 2007
  - This project will produce a software testing standard applicable to all types of software products and software-intensive systems.
  - Purpose: unify and integrate the currently fragmented corpus of normative literature regarding testing that is currently offered by three distinct standards-makers: BSI, IEEE, and ISO/IEC JTC 1/SC 7.
  - Four Parts

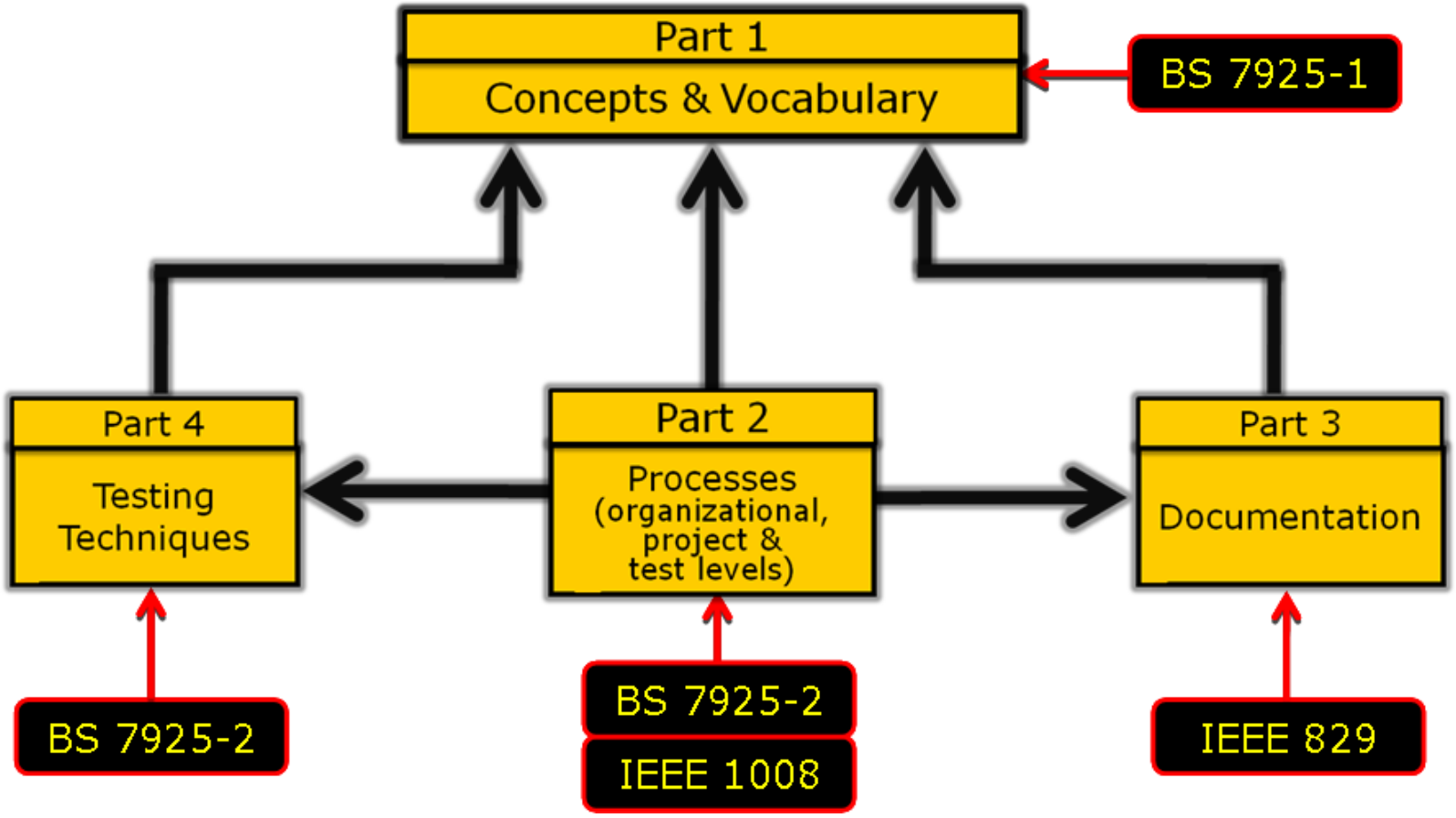
Organization

- ISO/IEC & National Bodies



- ISO Commitees & Working Groups:
  - ISO: International Organization for Standarization
  - JTC1: Information Technology
  - SC7: Software & Systems Engineering
  - WG26: Software Testing
- National Body (ES)
  - AENOR: Asociación Española de Normalización y Certificación
  - GT26: Pruebas del Software
  - http://in2test.lsi.uniovi.es/gt26/

ISO/IEC 29119 Software Testing - Structure

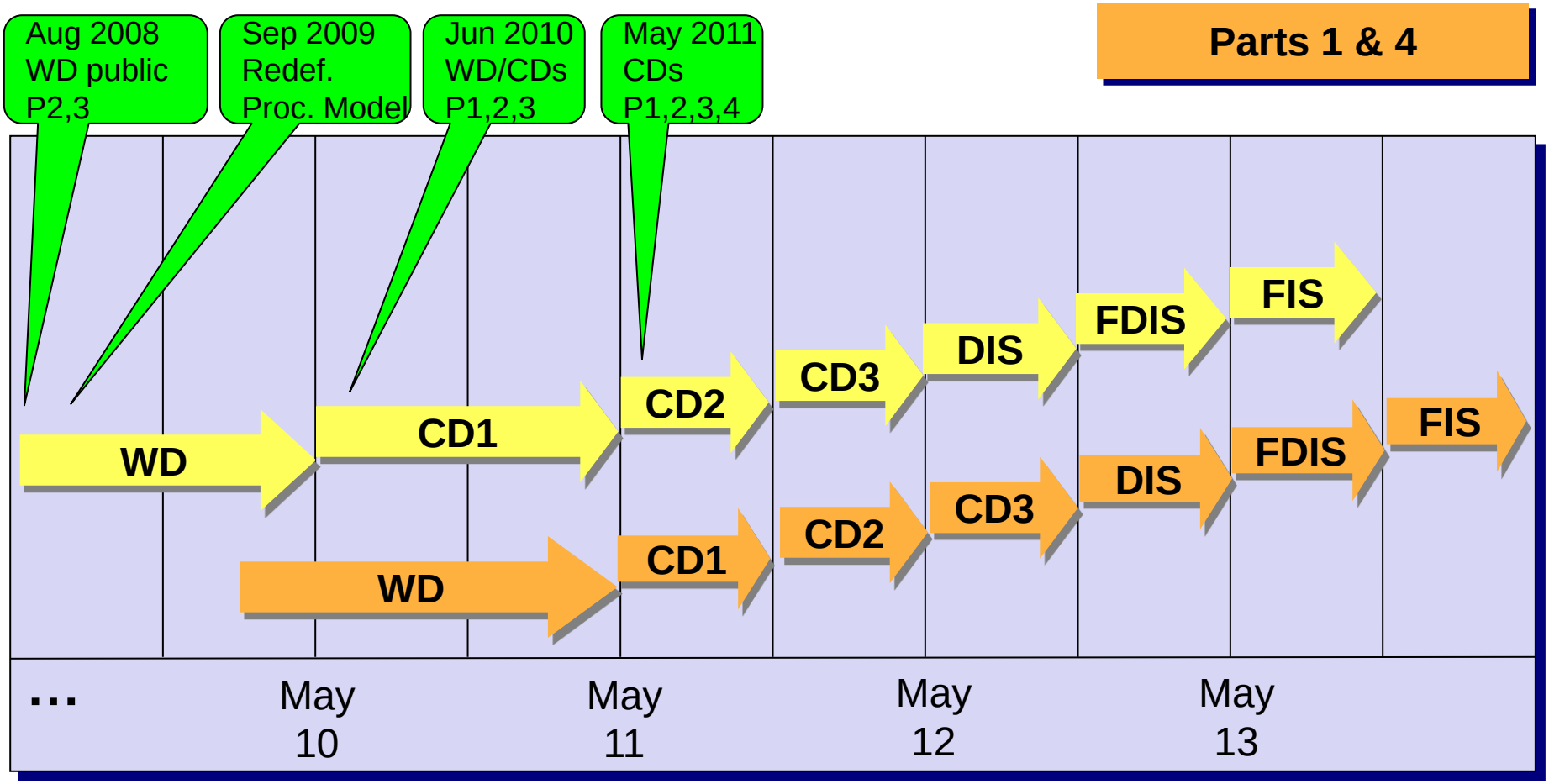


Timelines

Working Draft (WD)
Committee Draft (CD)
Draft International Standard (DIS)
Final Draft International Standard (FDIS)
Final International Standard (FIS)

Parts 2 & 3

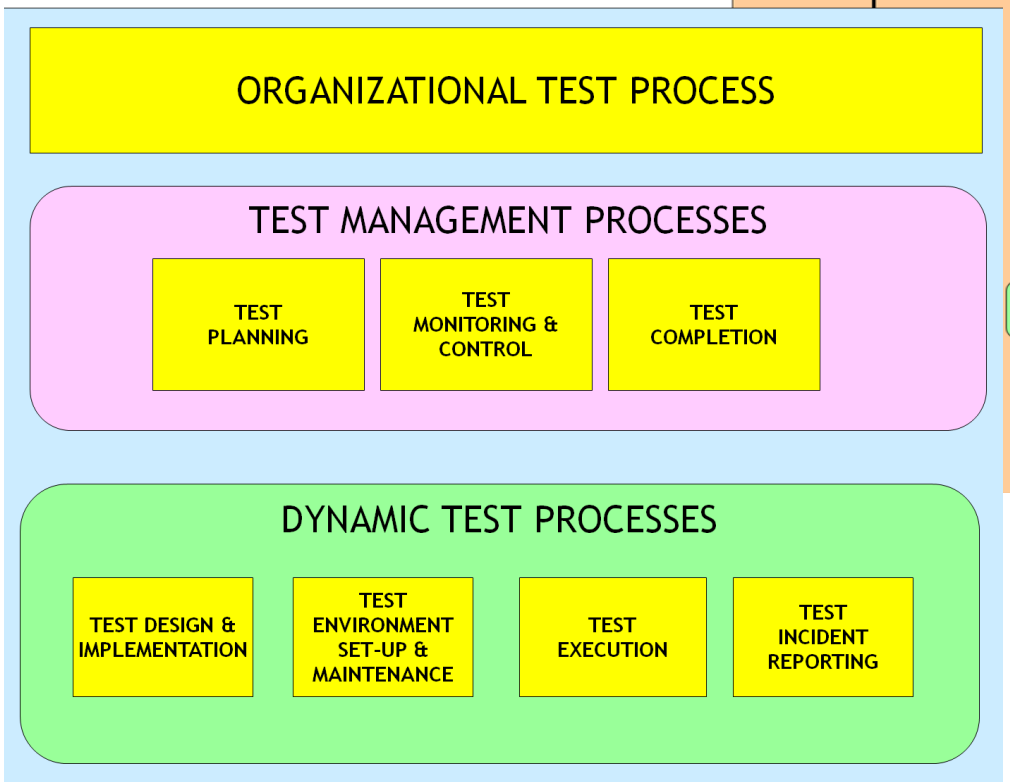
Parts 1 & 4

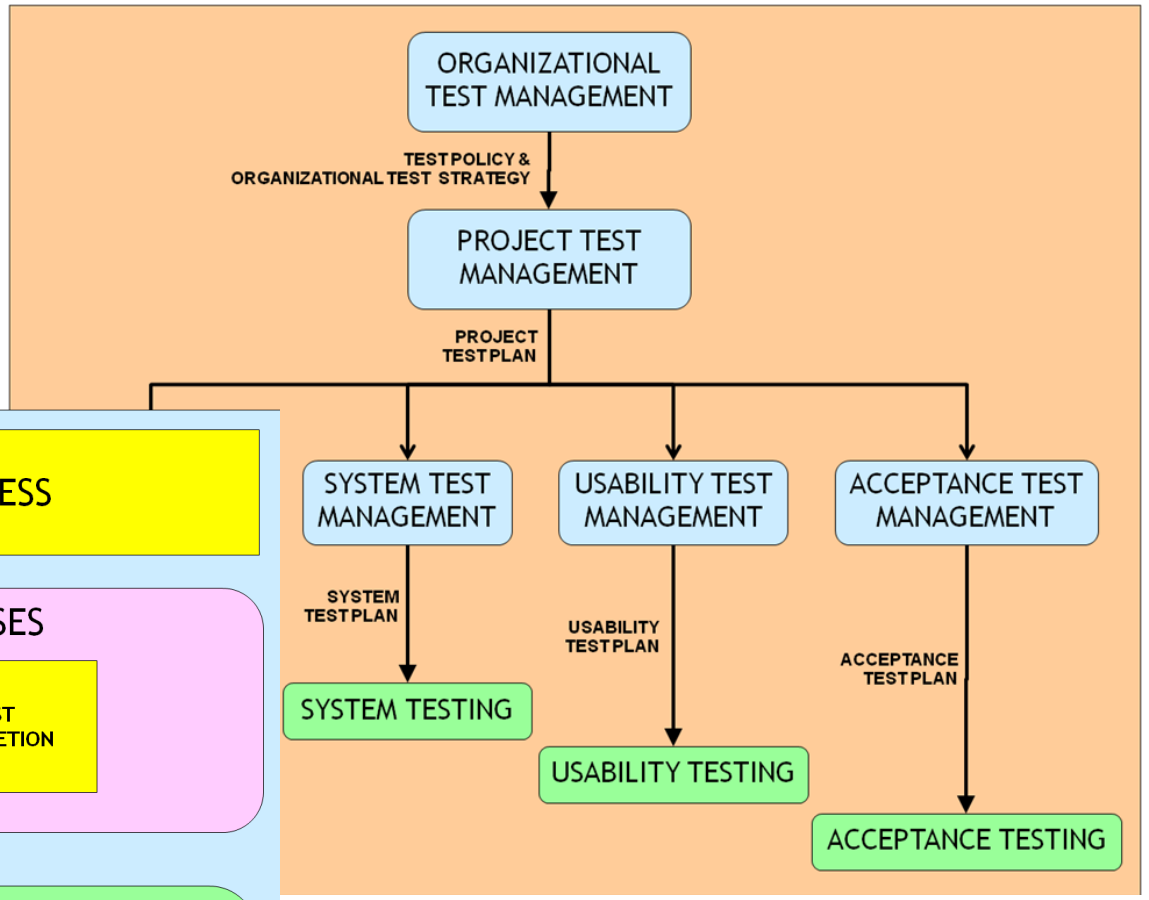


Part 1 – Concepts & Vocabulary (informative)

- Vocabulary of testing terms
- Software testing concepts (goal, levels, types, test basis, risk based testing)
- Testing in different life cycle models
  - Sequential
  - Agile
  - Evolutionary
  - Risk based Testing
- Roles and Responsibilities
- Metrics and Measures

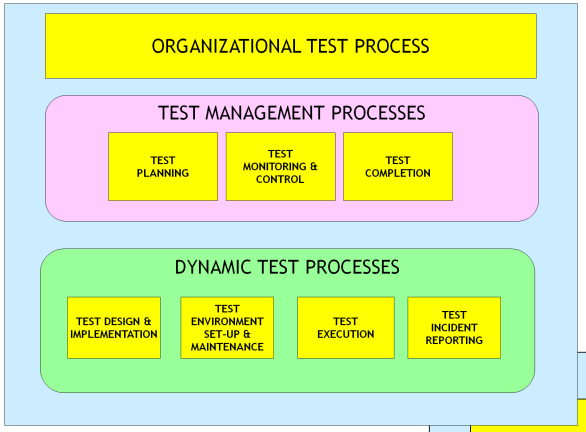
P2 - Process Model

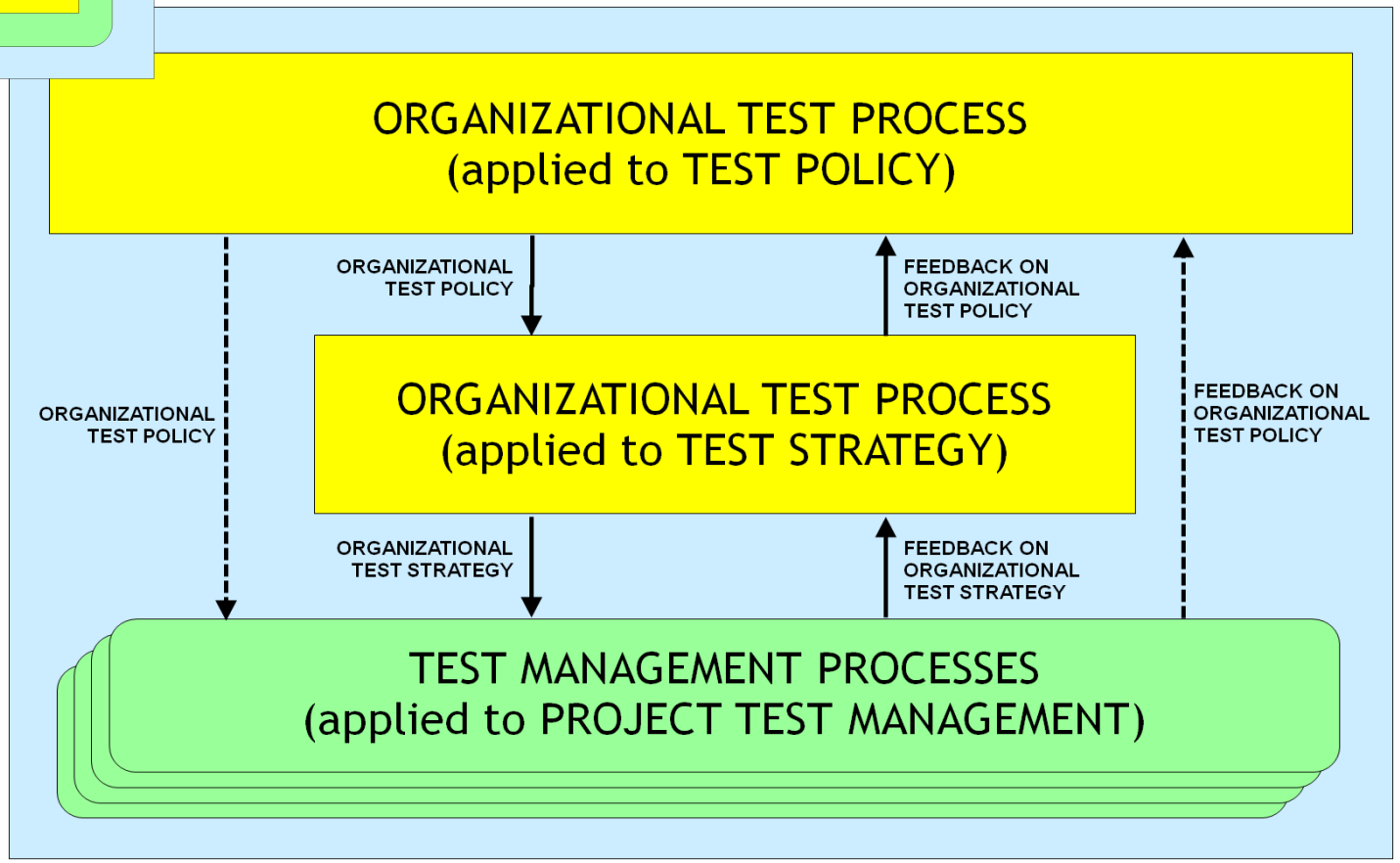




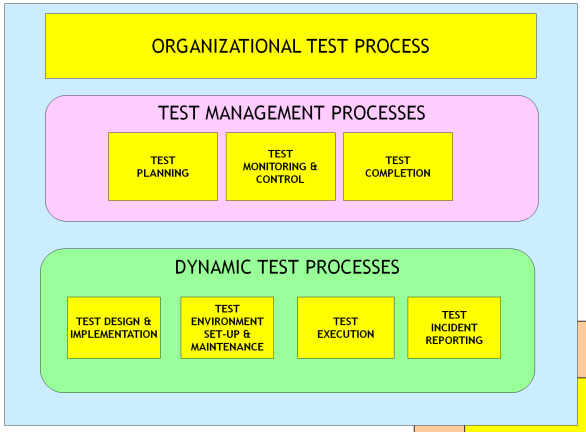
- Static Testing (reviews, static analysis…): covered by other standards, eg. IEEE 1012, 1028

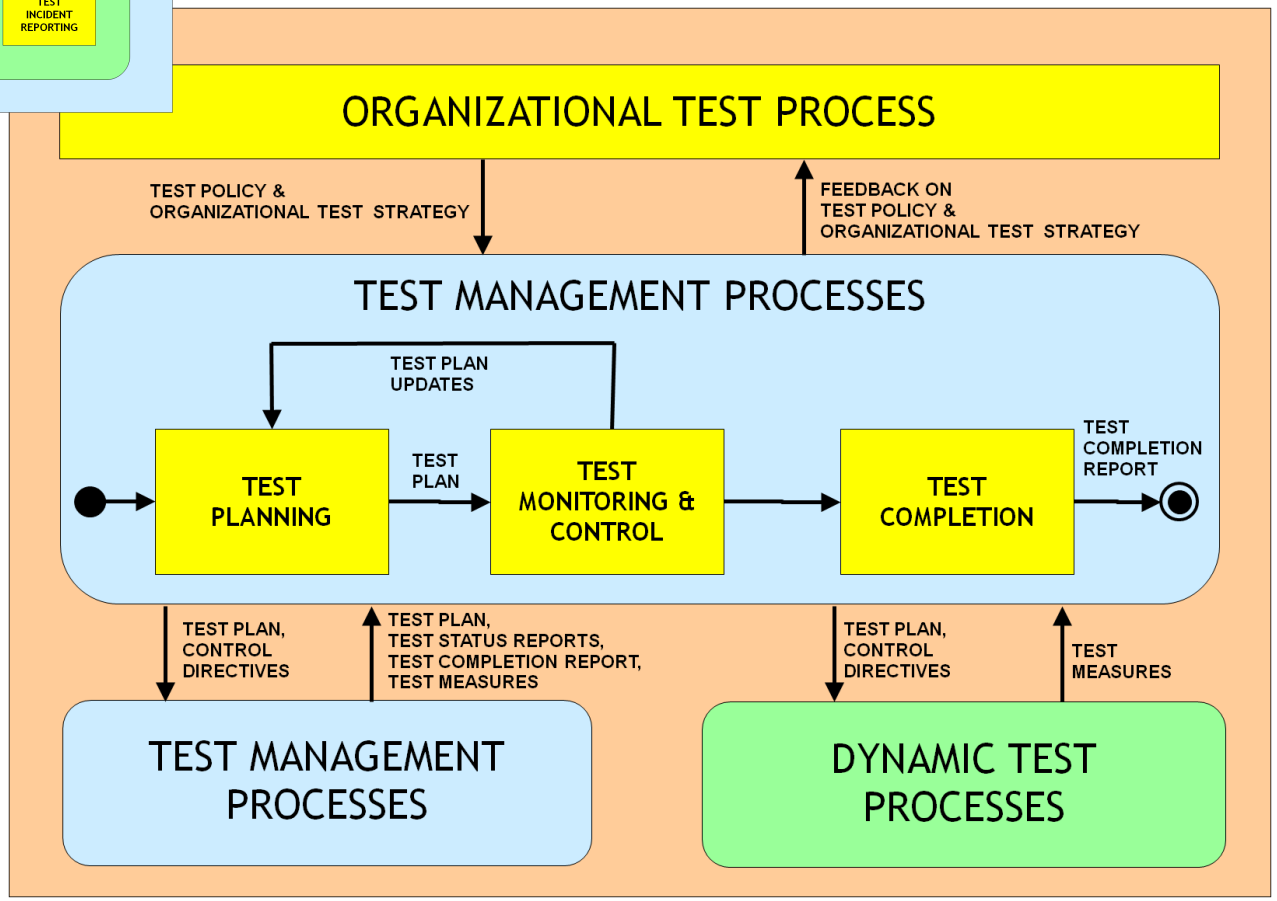
P2 - Organizational Test Process

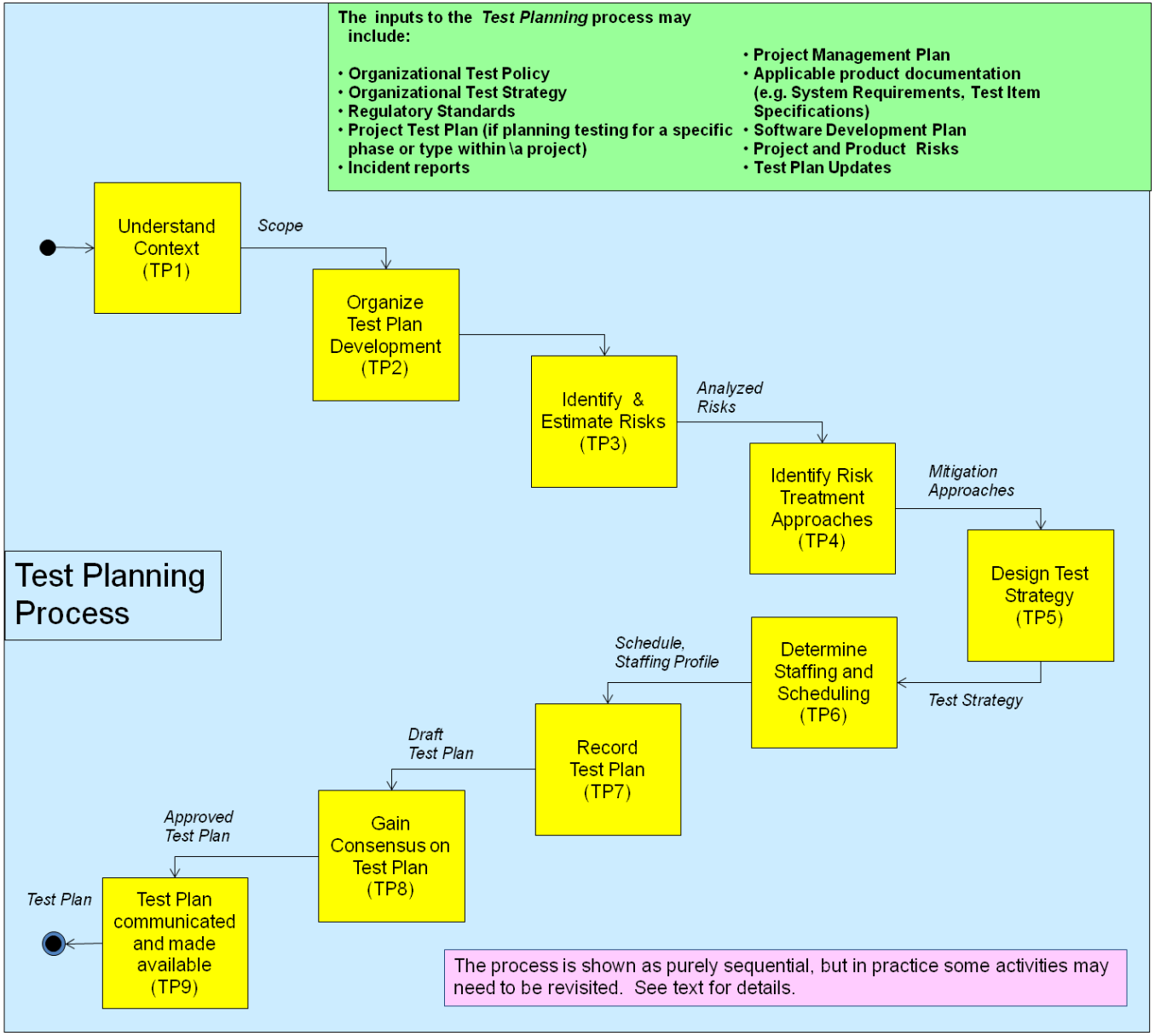




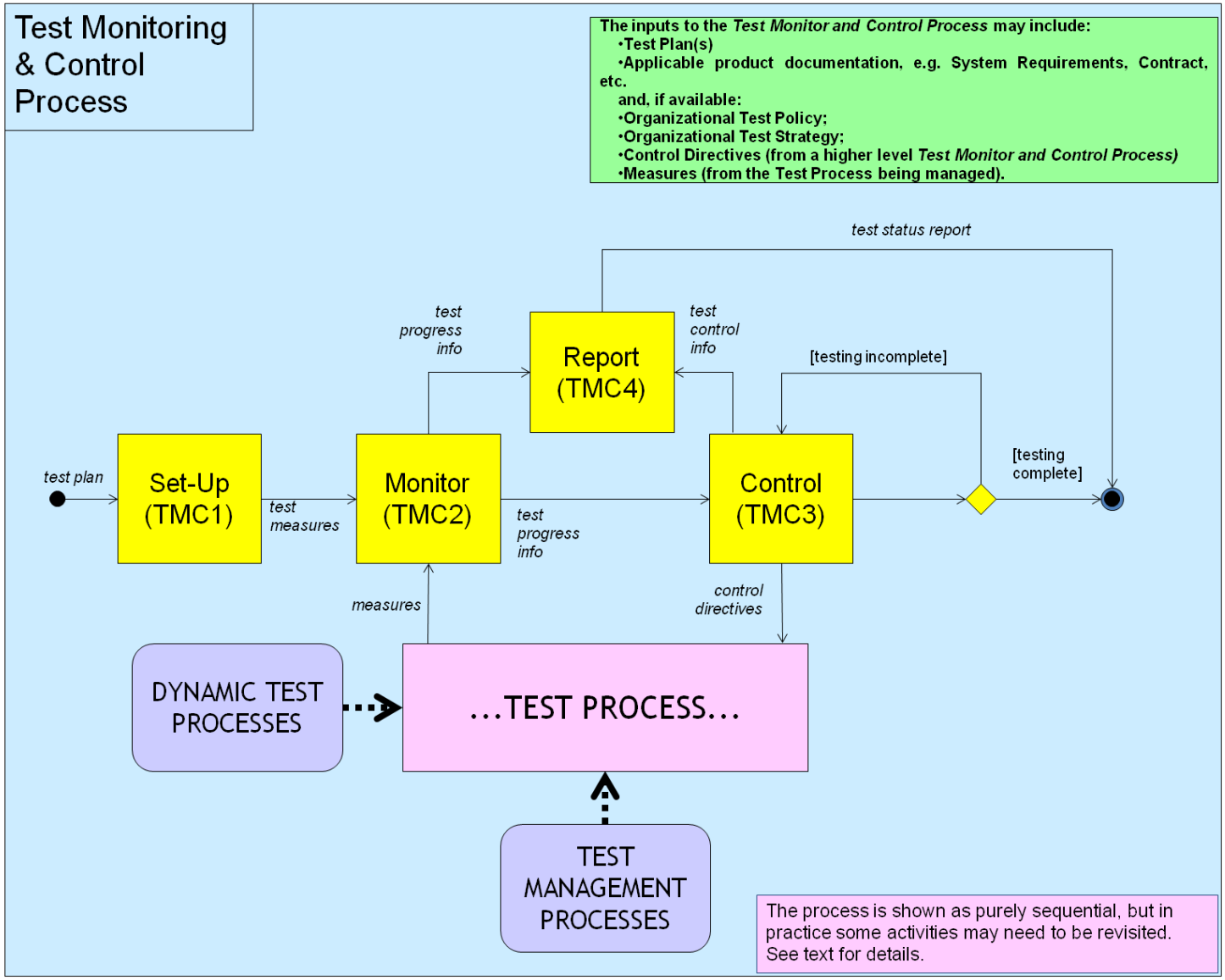
P2 - Test Management Process



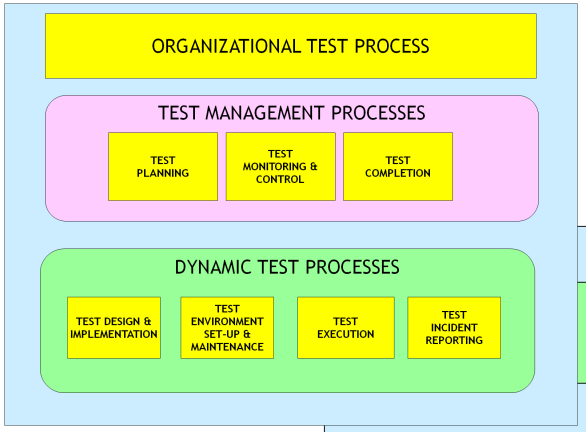


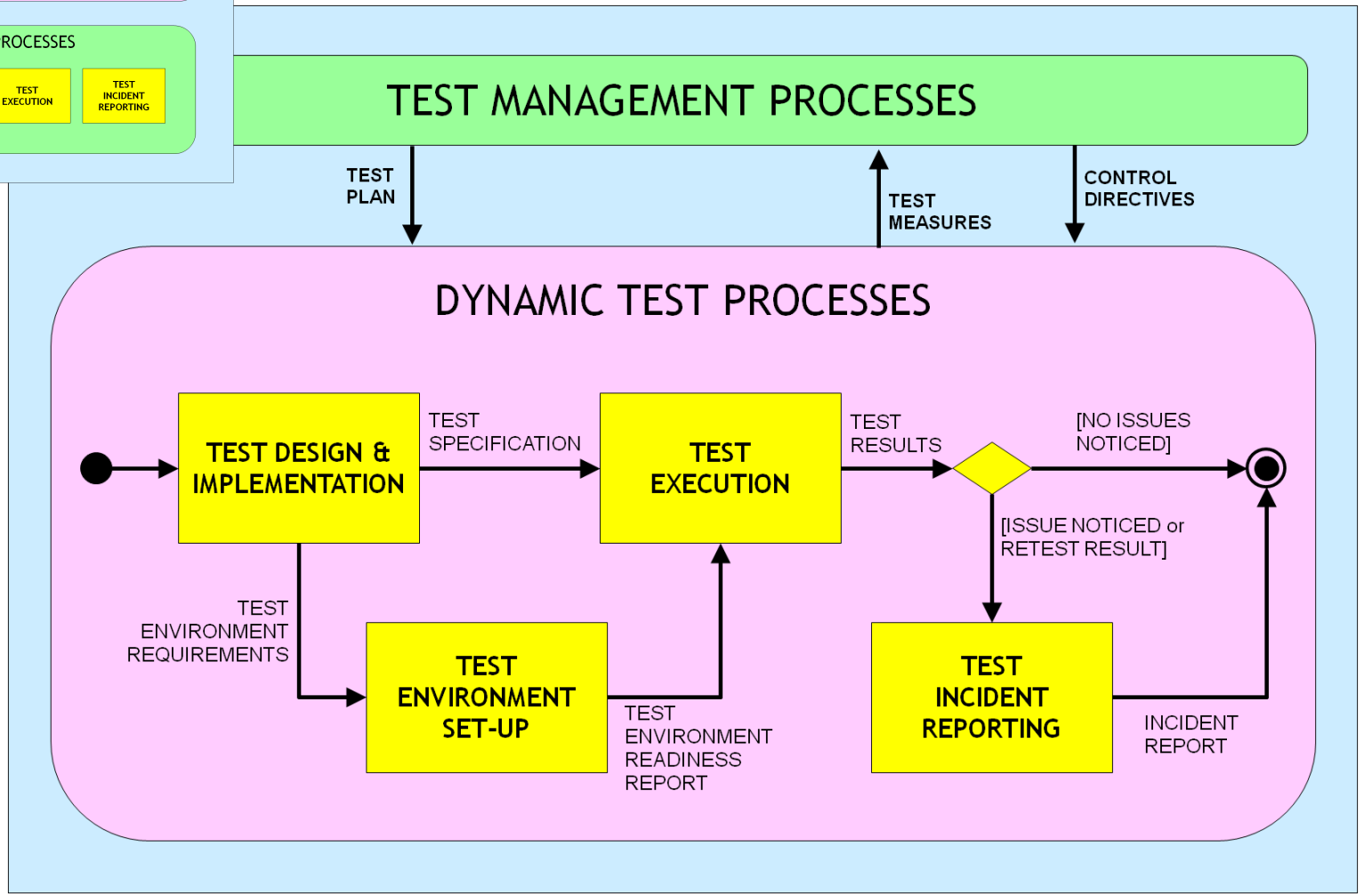

The inputs to the Test Planning process may include:
• Organizational Test Policy
• Organizational Test Strategy
• Regulatory Standards
• Project Test Plan (if planning testing for a specific phase or type within \a project)
• Incident reports
• Project Management Plan
• Applicable product documentation (e.g. System Requirements, Test Item Specifications)
• Software Development Plan
• Project and Product Risks
• Test Plan Updates
Test Planning Process
Understand Context (TP1)
Scope
Organize Test Plan Development (TP2)
Identify & Estimate Risks (TP3)
Analyzed Risks
Identify Risk Treatment Approaches (TP4)
Mitigation Approaches
Design Test Strategy (TP5)
Test Strategy
Determine Staffing and Scheduling (TP6)
Schedule, Staffing Profile
Record Test Plan (TP7)
Draft Test Plan
Gain Consensus on Test Plan (TP8)
Approved Test Plan
Test Plan communicated and made available (TP9)
Test Plan
The process is shown as purely sequential, but in practice some activities may need to be revisited. See text for details.

Test Monitoring & Control Process

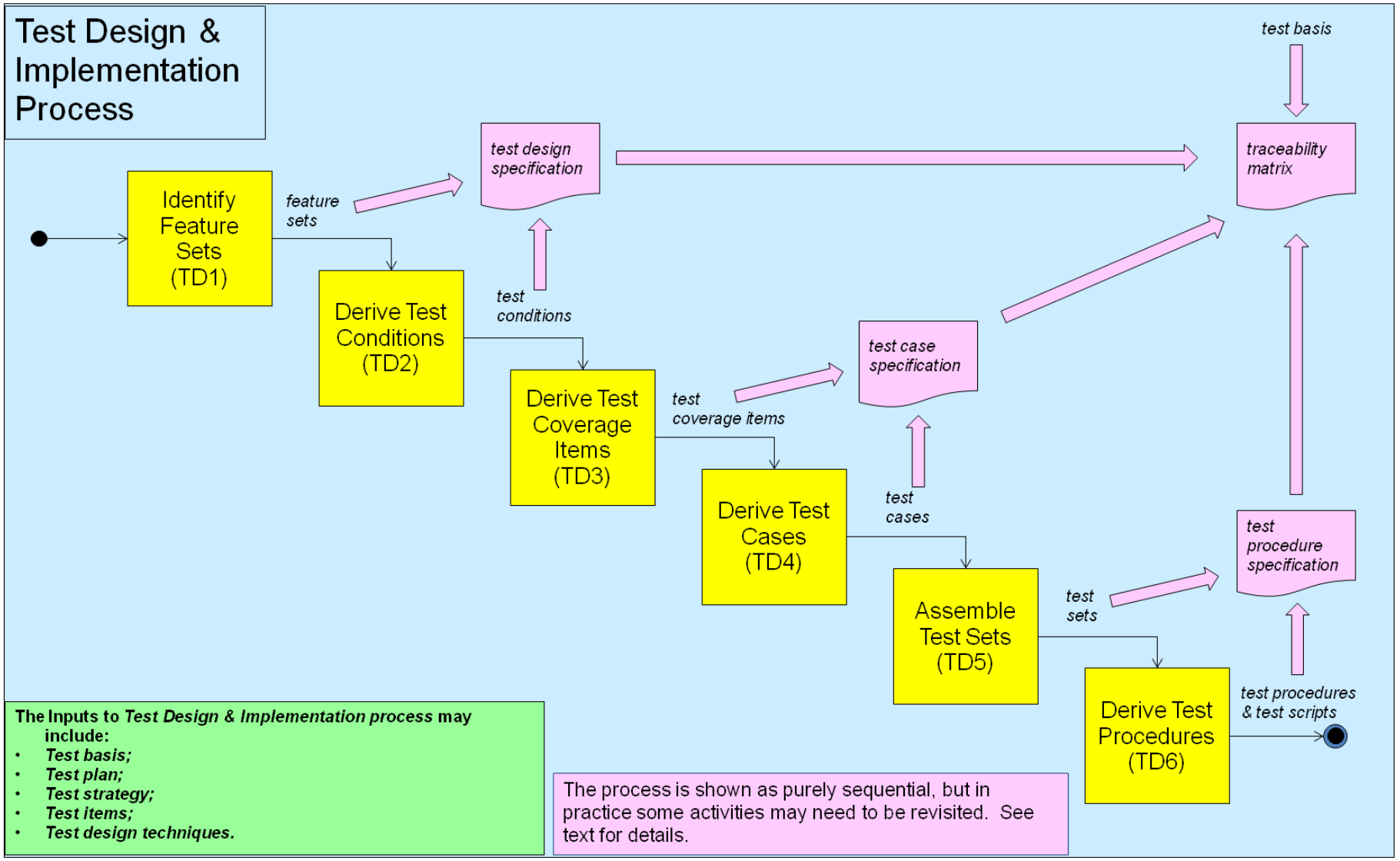


P2 - Dynamic Test Process





Test Design & Implementation Process



Parts 3,4 – Documentation and Techniques

- P3 - Documentation
  - Content + Templates + Examples
- P4 - Techniques
  - Description + Examples
  - Dynamic Testing: Specification-based, Structure-based
  - Static Testing (covered in other standards)
  - Test Measurement Techniques
  - Test of Quality Characteristics

More: Test Process Assessment

- May 2010 Proposal New Work Item (part 5?)
  - ISO/IEC 15504-2 as a Reference Assessment Model
  - ISO/IEC 29119-2 as a Reference Process Model
  - Consider TMMi & TPI
- To consider include it in the new versions of 15504 (33000 series)
  - ISO/IEC 33063 Process Assessment Model for Software testing processes

Conclusion

- International standard ISO/IEC 29119 will provide practitioners with guidelines for testing that cover all aspects of the life cycle
  - Provide consistent set of definitions, processes, procedures & techniques for software testing
  - Fill gaps not covered by current standards
  - To be adopted by national standards bodies
  - Currently has representation from 18 nations and is being reviewed by software testing professionals world-wide
- More Info:
  - GIIS Software Engineering Group: http://giis.uniovi.es/
  - Working Group GT26: http://in2test.lsi.uniovi.es/gt26/