

# ***Standardization effort: ISO/IEC 29119 Software Testing***

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# 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

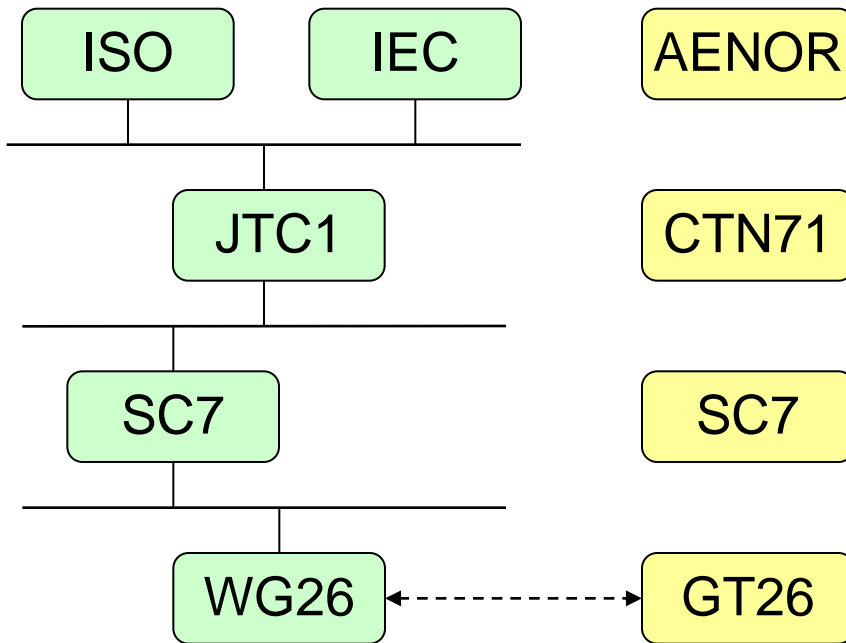
- IEEE & BSI Standards
  - IEEE 829 deals with documentation (implicit process)
  - IEEE 1008 deals with unit testing
  - BS 7925-1 & 2 unit testing standards
- Not covered:
  - Integration testing, system testing, acceptance
  - Explicit test process model
  - Project test management & organization-level
  - 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



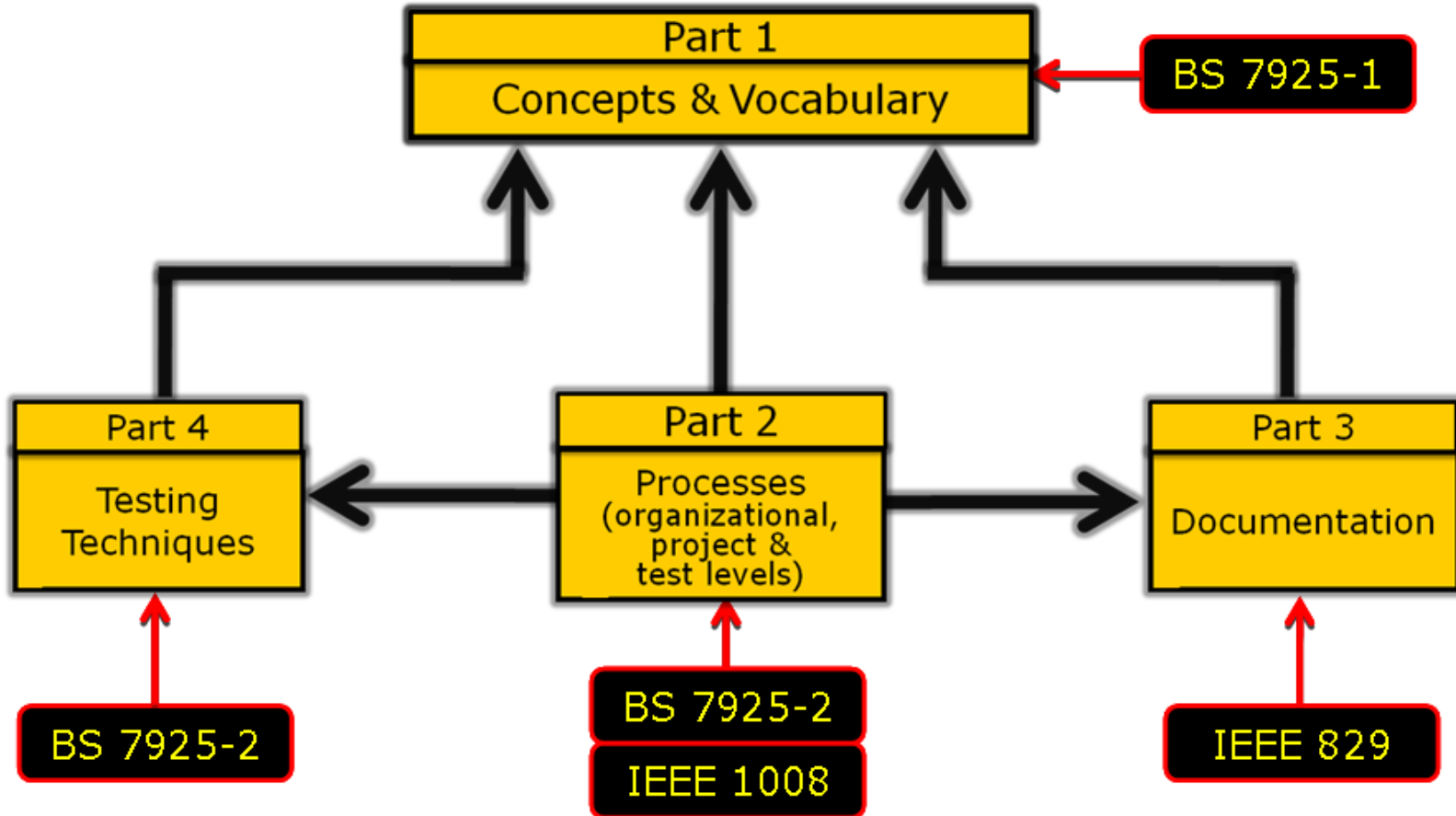
## ■ ISO Committees & Working Groups:

- ISO: International Organization for Standardization
- 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

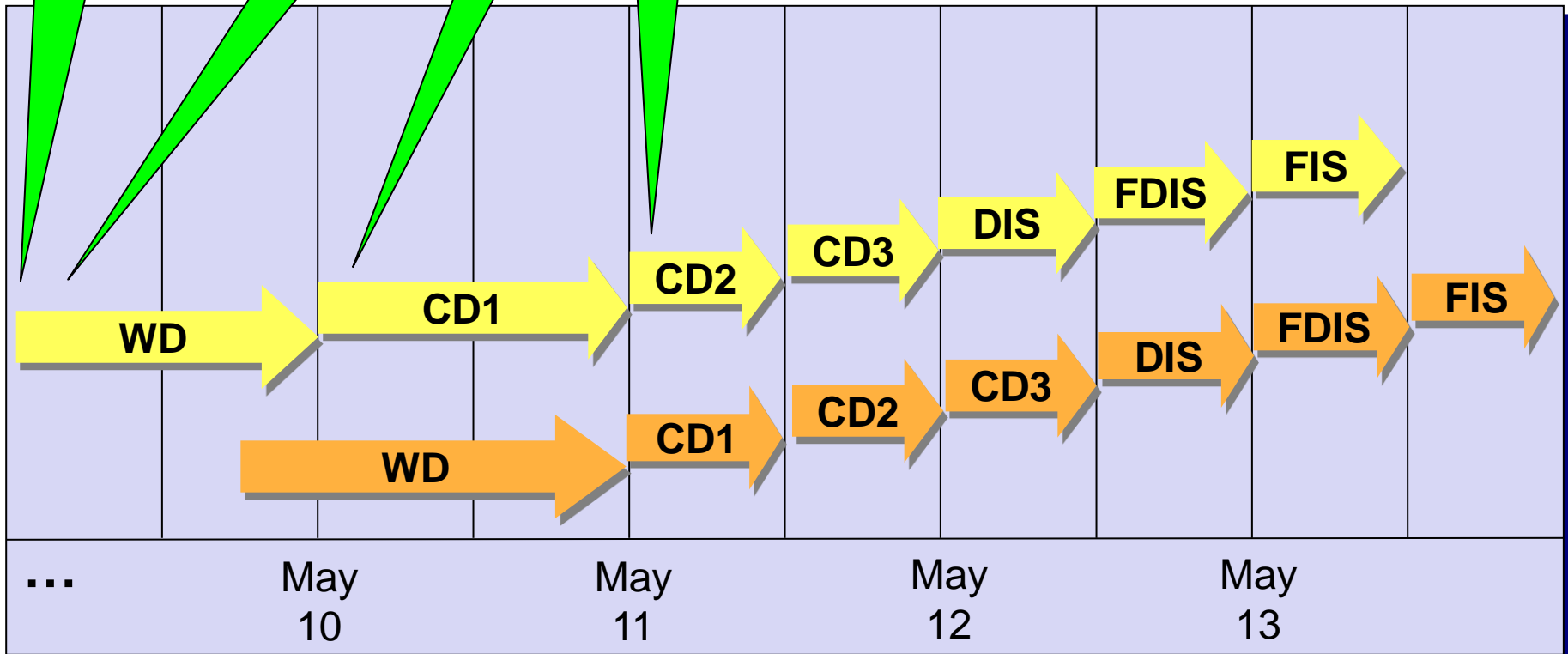
Parts 1 & 4

Aug 2008  
WD public  
P2,3

Sep 2009  
Redef.  
Proc. Model

Jun 2010  
WD/CDs  
P1,2,3

May 2011  
CDs  
P1,2,3,4

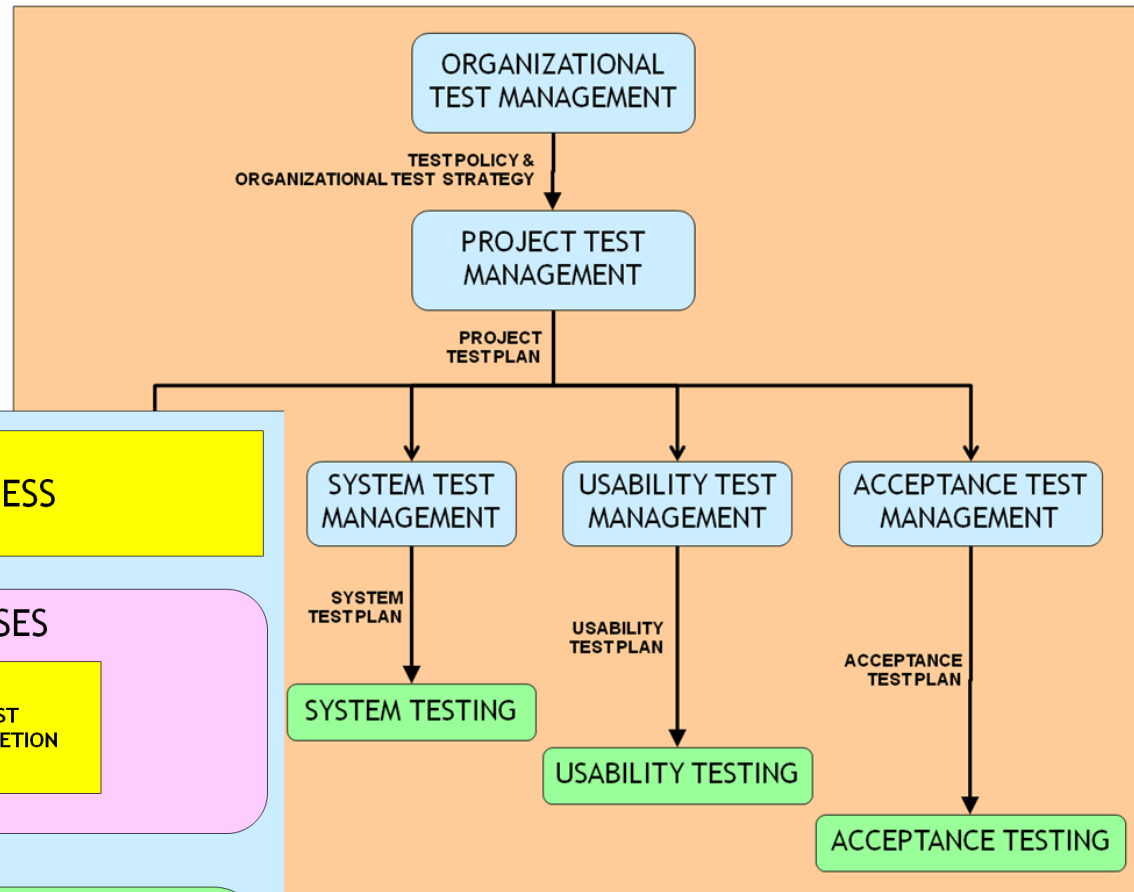
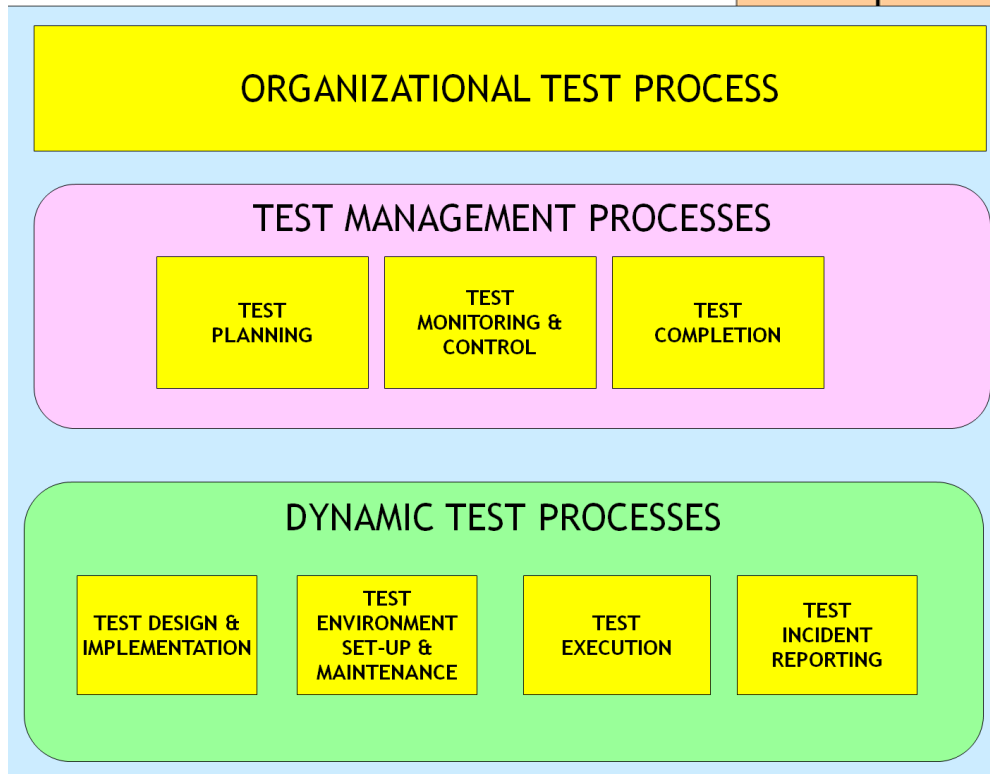


# Part 1 – Concepts & Vocabulary (informative)

- 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

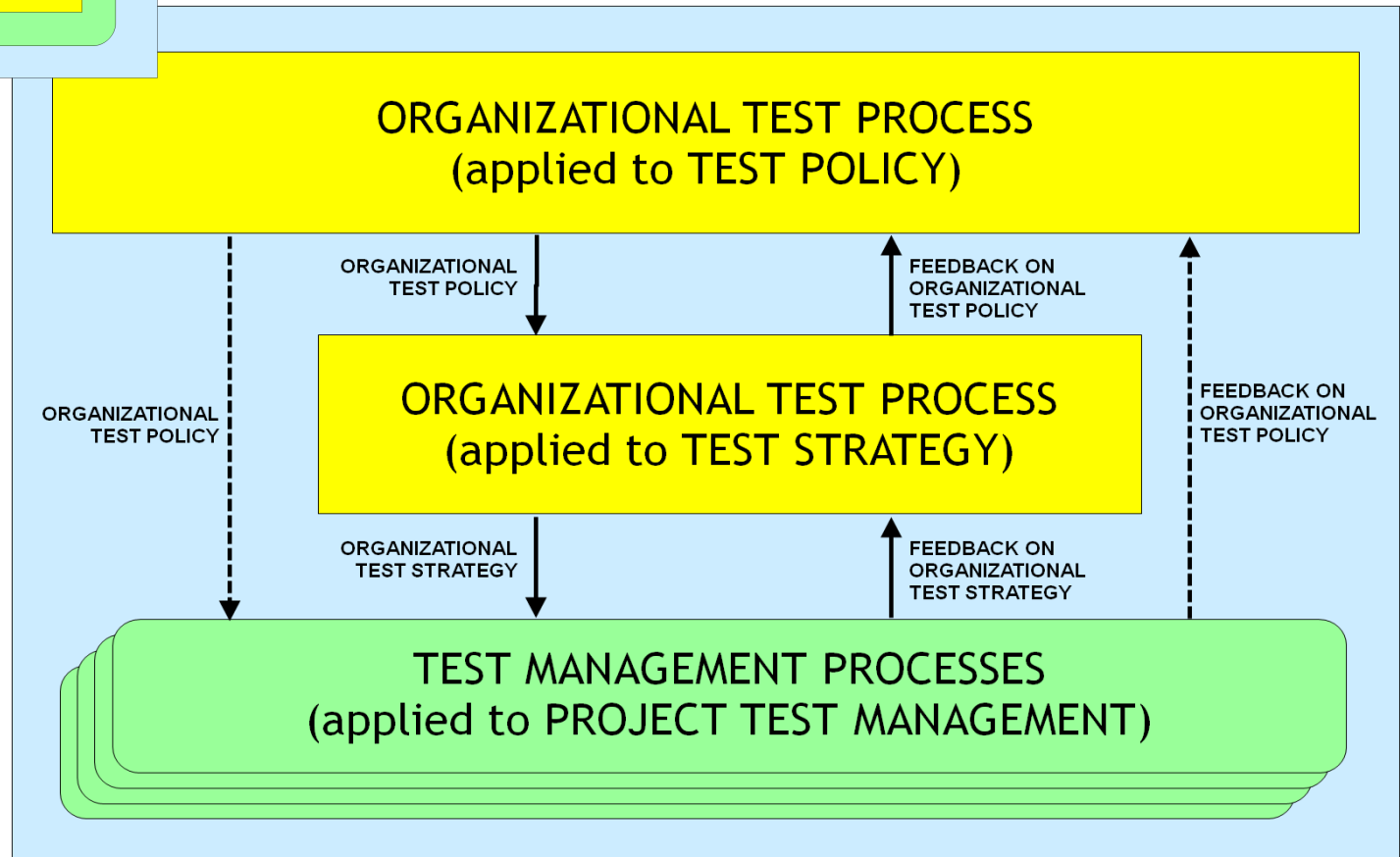
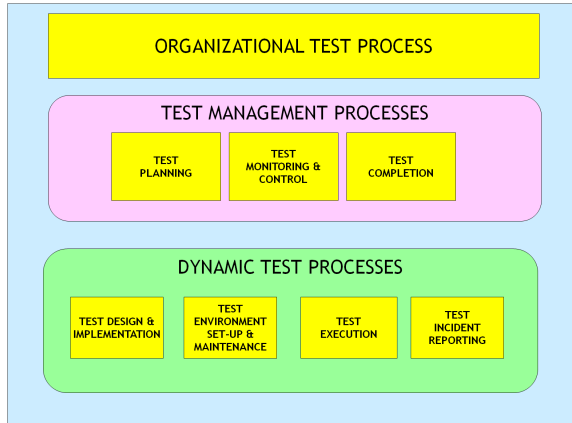


# P2 - Process Model

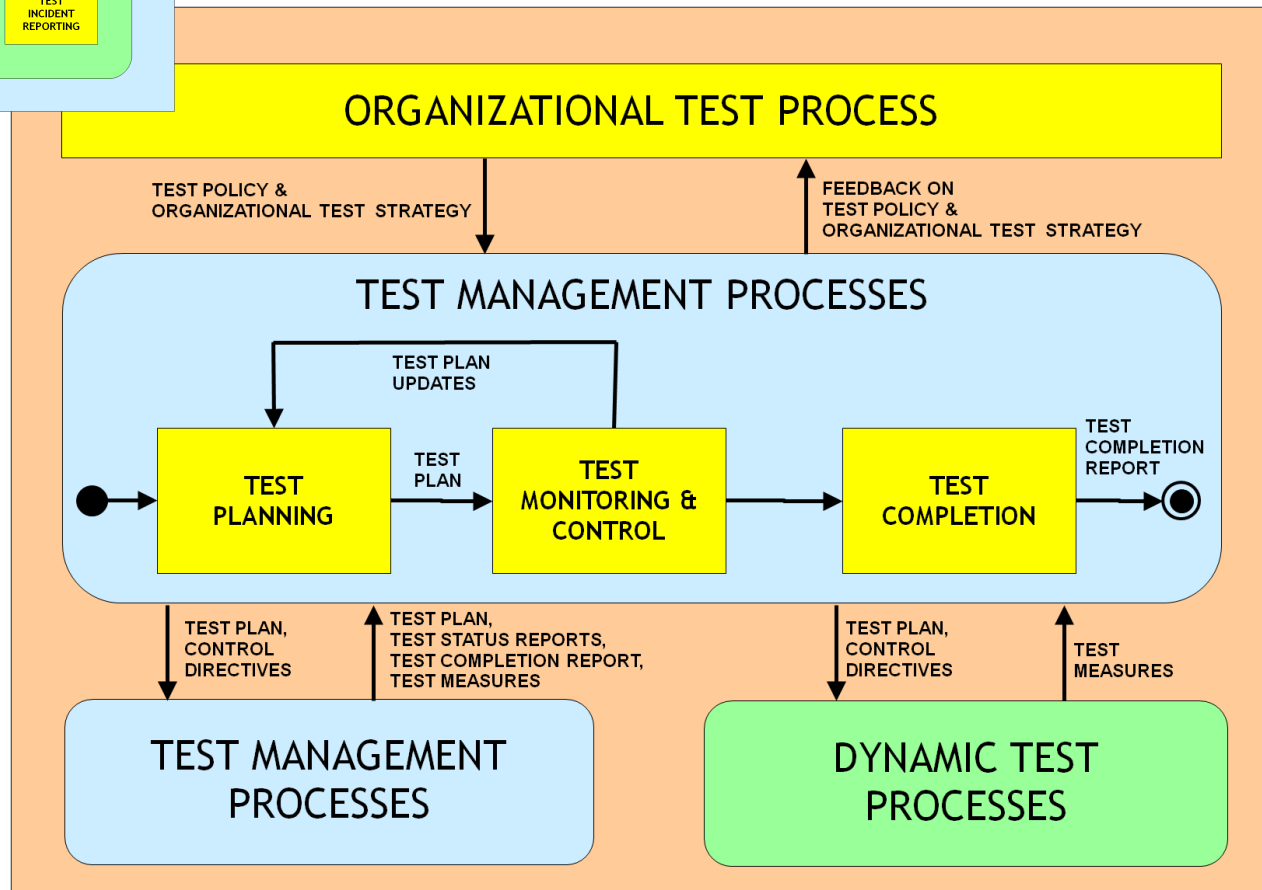
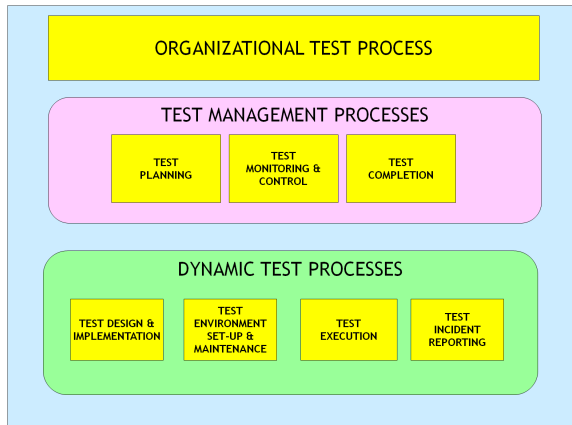


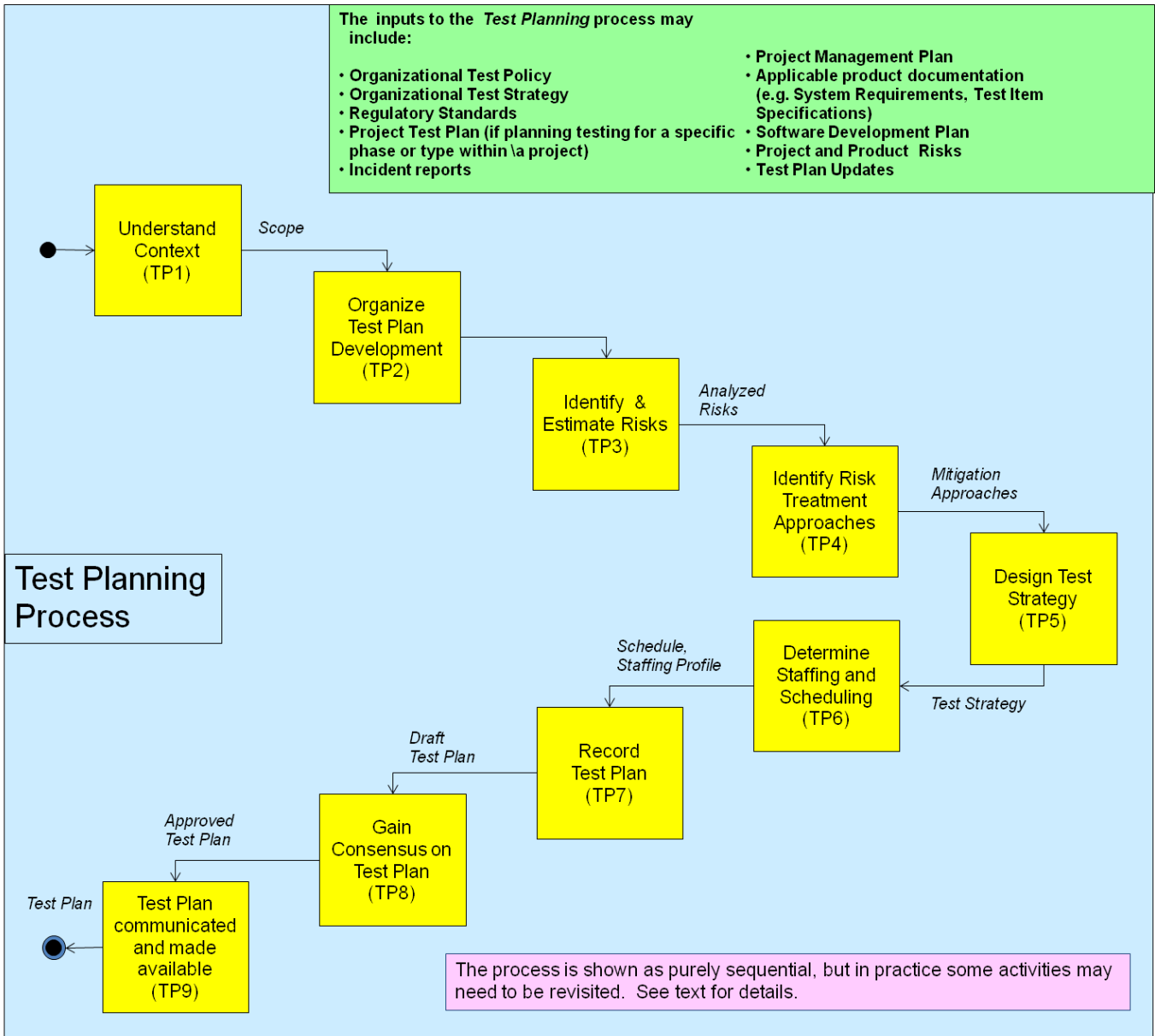
- Static Testing (reviews, static analysis...): covered by other standards, eg. IEEE 1012, 1028

# P2 - Organizational Test Process



# P2 - Test Management Process





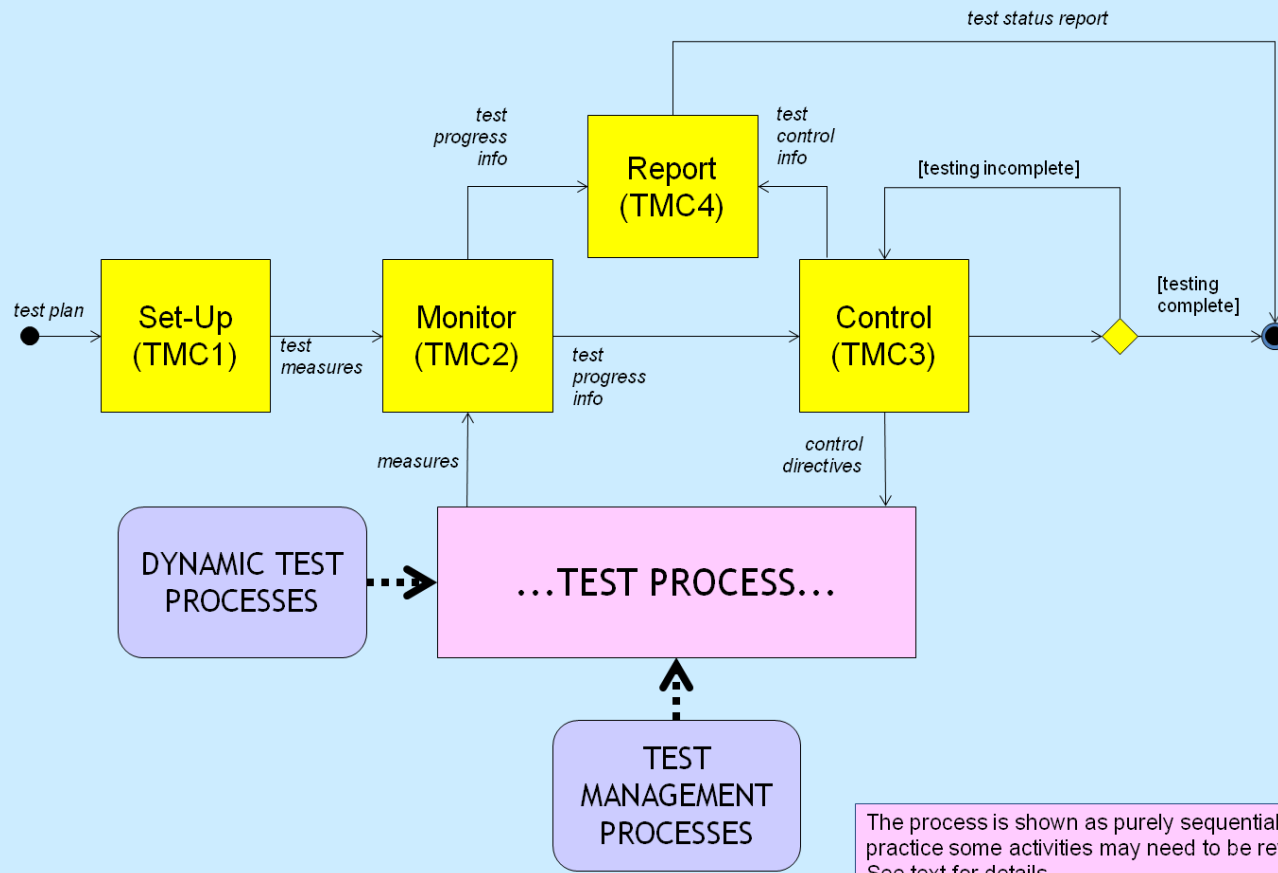
# Test Monitoring & Control Process

The inputs to the *Test Monitor and Control Process* may include:

- Test Plan(s)
- Applicable product documentation, e.g. System Requirements, Contract, etc.

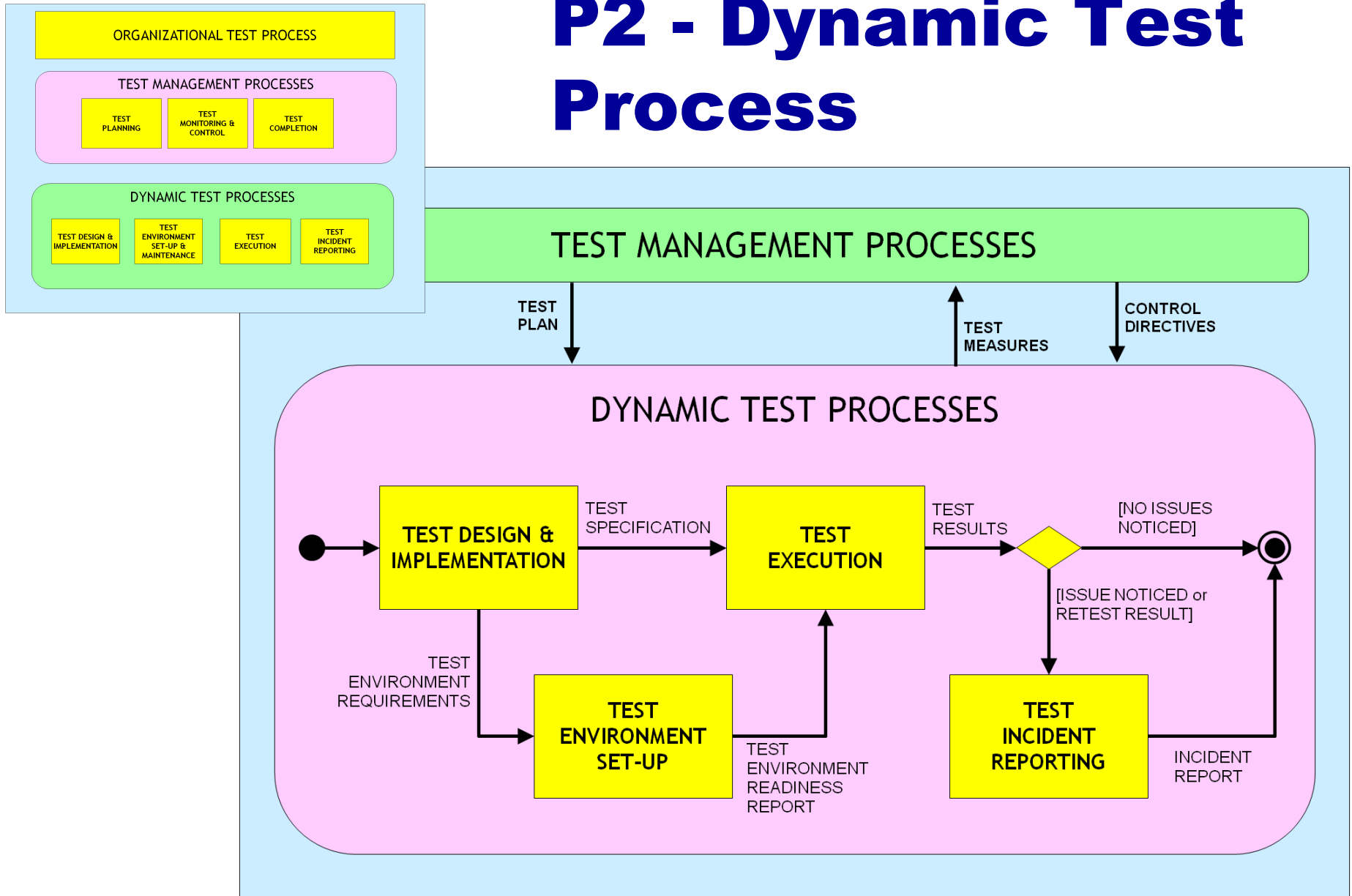
and, if available:

- Organizational Test Policy;
- Organizational Test Strategy;
- Control Directives (from a higher level *Test Monitor and Control Process*)
- Measures (from the *Test Process* being managed).

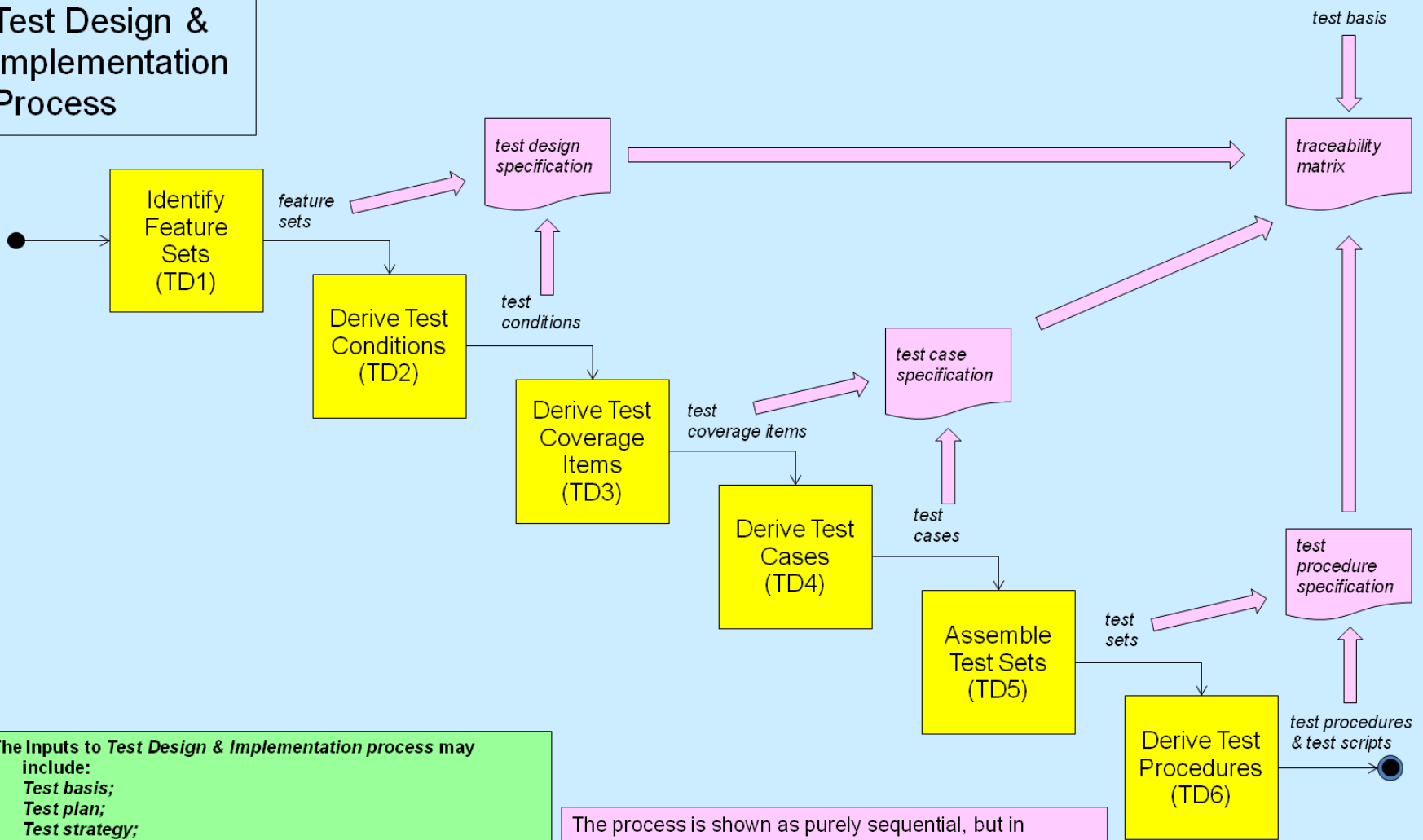


The process is shown as purely sequential, but in practice some activities may need to be revisited. See text for details.

# P2 - Dynamic Test Process



# Test Design & Implementation Process



The Inputs to Test Design & Implementation process may include:

- Test basis;
- Test plan;
- Test strategy;
- Test items;
- Test design techniques.

The process is shown as purely sequential, but in practice some activities may need to be revisited. See text for details.

# 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/>