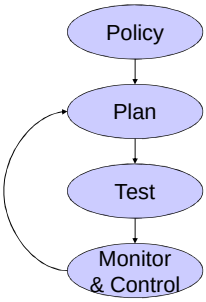
15. Test management

Policy
Plan
Test
Monitoring and control
Organisational structures

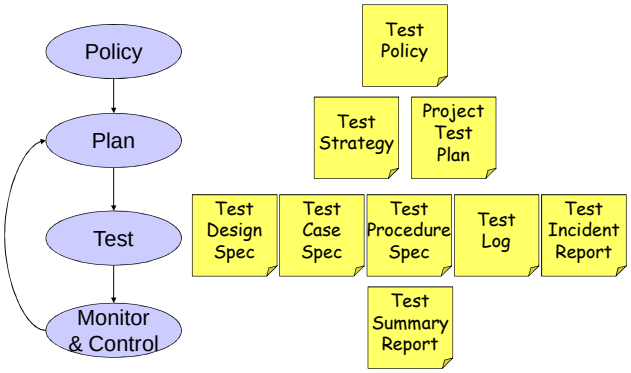
"Testing is the process of executing a program with the intent of finding errors."

Glen Myers

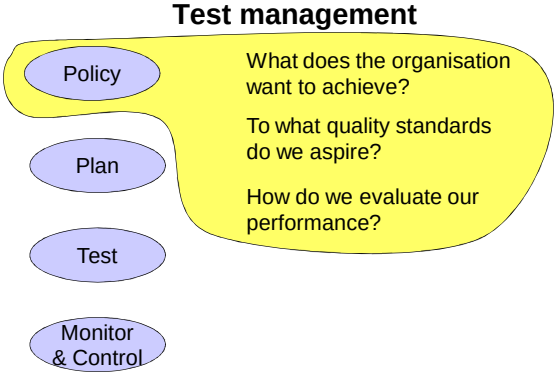
Test management



Test management, documentation and standards



Test management



1. Policy

- **Purposes**
  - To ensure that new or modified products meet the business requirements for which they have been developed or enhanced
  - To ensure that a testing strategy that is efficient, effective and economic is both devised and applied
  - To manage both test resource and test environment

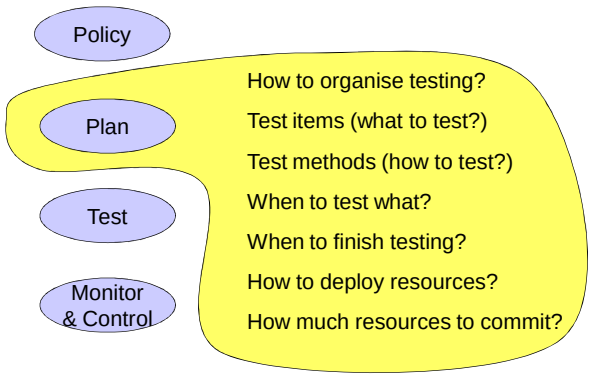
http://www.ogc.gov.uk/

1. Policy
Test Policy document

- A short, high level document, representing a “philosophy” of the organisation
- Comprises definitions of
  - Testing
    - e.g. “Checking that the software solves a business problem”
  - Testing process
  - Evaluation of testing
  - Quality to be achieved
  - Organisational approach to process improvement

For further examples of definitions see the **ISEB Practitioner Syllabus** (http://www.bcs.org/upload/pdf/practsyll.pdf or follow links from the Module Web Resources pages)

Test management



2. Plan
Test Strategy document

- Based on the test policy
- Covers the generic test requirements for an organisation
- Explicitly addresses the link between the risks and testing
- Includes a description of the test phases and their high-level description, e.g.
  - Entry and exit criteria
  - The approach to testing (top-down, bottom-up …)
  - The test design techniques
  - Standards to be complied with
  - Environment in which software will be tested
  - Metrics
  - Etc.

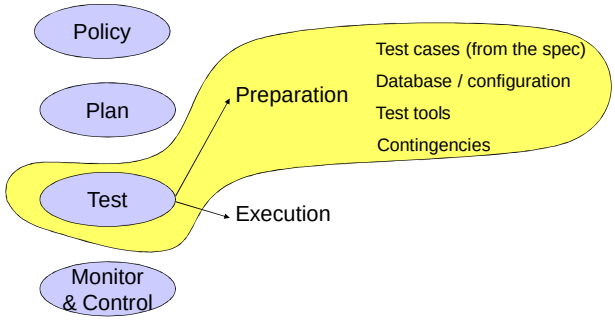
2. Plan
Test Strategy document (cont.)

- Test Strategy does not have to be enclosed in a single document (see e.g. IEEE Std. 829-1998)
- For further items comprising the Test Strategy Document see the **ISEB Practitioner Syllabus** (follow links from the Module Web Resources pages)
- See IEEE Standard 829-1998 for the templates and examples of the Test Strategy items (templates in sections 4.1 – 4.2, examples in Annex A)

2. Plan
Project Test Plan document

- Documents the implementation of the overall strategy
- Normally comprises a separate document
- See IEEE Standard 829-1998 for the templates and examples of the Project Test Plan (templates in sections 1-4, examples in Annex A) (in: ieee_std_829-1998.pdf - follow links from the Module Web Resources pages)

Test management



3. Test
Preparation: test planning

- The requirements definition and design specifications to facilitate the identification of major test items
- A detailed test plan and schedule with key test responsibilities indicated
- Test estimation, including all the resources (people and time) and contingencies

3. Test
Preparation: test specifications

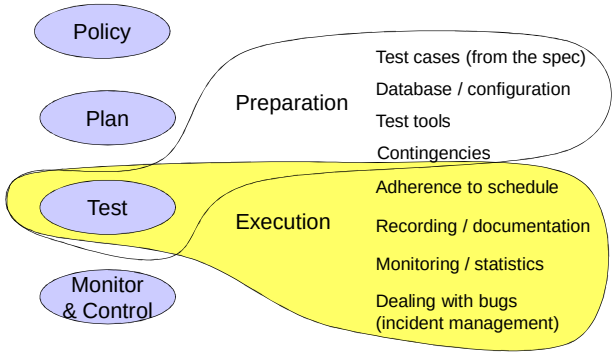
- Preparation of test specifications for all levels of testing and covering all categories of tests
- The required outcome of each test must be known before the test is attempted
- Configuration identification

  Configuration items = software items, tools, test case databases, etc; and their versions

3. Test
Preparation: phase test plans

- Detailed plans for each software testing phase envisaged in the test plan, e.g.
  - Component testing plan
  - Integration testing plan
  - System testing plan
- See IEEE Standard 829-1998 for the templates and examples of the relevant documentation (templates in sections 5-7, examples in Annex A)
- Test design specification
  - Test case specification
  - Test procedure specification

Test management



3. Test
Execution: recording and monitoring

- Involves measures for tracking progress of testing
  - Number of test runs
  - Tests passed / failed
  - Incidents raised
  - Incidents fixed
  - Retests
  - Etc.
- Necessary input for management decisions, e.g.
  - When project runs out of resources
  - When project runs out of time before completion criteria are achieved

3. Test
Execution: incident management

- "An incident is any significant, unplanned event that occurs during testing and requires subsequent investigation and/or correction."
- Incidents are raised when expected and actual test results differ
- Incidents may be raised against
  - Documentation
  - Code
  - System under test

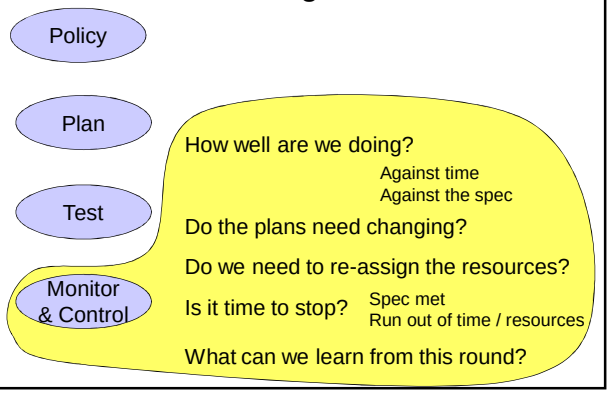
3. Test Execution: incident management

- Incidents should be logged
- Details to be included in the log
  - Expected and actual results
  - Test environment
  - Software under test
  - Tester(s) name
  - Severity
  - Scope
  - Priority
  - Any other information relevant to reproducing and fixing the potential fault

3. Test Execution: incident management

- Incidents must be tracked, from inception to close-out and resolution
- Incidents should be analysed to monitor the test process and to aid in test process improvement
- See IEEE Standard 829-1998 (templates in sections 9-10, examples in Annex A)
- Full details in IEEE Standard 1044.1-1995 “Guide to Classification of Software Anomalies”

Test management



4. Test monitoring, control and assessment

- Ongoing monitoring and assessment of the integrity of the development and construction
- Ongoing reviews of the status of the configuration items against the phase plans
- Executive mechanisms involving re-allocation of resources and changes of plan
- Used mainly for dealing with changes and contingencies, e.g.
  - Changes to the test schedule
  - Deployment of testing staff
  - Change of the test environment

4. Test monitoring, control and assessment

- Preparation of test progress reports to provide assurance of the verification and validation activities
- See IEEE Standard 829-1998 (templates in section 11, examples in Annex A)

4. Test monitoring, control and assessment

- **Product assurance**
  - To ensure that the outcome of the verification activities meets the agreed acceptance criteria
  - Necessary prior to the decision to negotiate the acceptance testing programme and the release and commissioning of the service product
  - May involve overseeing some of the test activity and may participate in process reviews

Organisational structures for testing

- Testing could be carried out by
  - Developers
  - The team (“buddy” testing)
  - One specific person in the organisation
  - Dedicated testing team
  - Internal test consultants
  - External organisation

Recommended approach

- Multidisciplinary dedicated testing team
- Skills and roles
  - Test analyst, to prepare strategies and plans
  - Test automation expert
  - Test database designer and/or administrator
  - User interface expert
  - Test environment manager
- External participants
  - User representatives
  - Domain experts
  - Management representatives
  - Software development team representatives

Further reading

- Craig and Jaskiel, Appendix C: IEEE Templates
  - Test documents (IEEE Std. 829-1998)
  - Test plan (IEEE Std. 829-1998)
  - Software unit testing (IEEE Std. 1008-1997)
  - Test design specification (IEEE Std. 829-1998)
  - Test case specification (IEEE Std. 829-1998)
  - Test procedure (IEEE Std. 829-1998)
  - Test log (IEEE Std. 829-1998)
  - Test incident report (IEEE Std. 829-1998)
  - Test summary report (IEEE Std. 829-1998)
- The original IEEE Standards are available from the Module resource web page (local access only)

Web resources

Standards

- IEEE Standard 829-1998 for Software Test Documentation Local access only
- IEEE Standard 830-1998 Recommended Practice for Software Requirements Specification Local access only
- IEEE Standard 1008-1987 IEEE Standard for Software Unit Testing Local access only
- ISO 9000 International Quality Assurance System Standards

British Computer Society (BCS) resources

- Testing Standards Working Party (BCS)
- British Computer Society: Software Testing Qualifications
- BCS Specialist Interest Group in Software Testing (SIGIST)

Web resources

User groups and other organisations

- Software Testing Online Resources (STORM)
- Software Testing: Monographs and Opinions (STORM)
- Software Testing Resources (ApTest)
- Automated Testing Specialists: Automated Test Tools
- KANER.COM. Articles on Testing Computer Software.
- KANER.COM. Software testing - Course notes
- Testing Education
- comp.software.testing FAQ
- PBSystems: Software Testing Links
- PBSystems: Tools
- Software testing techniques - downloadable references

Web resources

Other links

- A primer on Requirements Engineering
- Crib sheet of key software testing terms
- Testing Software Systems Using Scenarios
- Sample Design Specification (.zip)
- Sample Weekly Status Report (.zip)
- Sample Final Release Report (.zip)
- Standard Test Plan (.doc)
- Standard Test Approach (.doc)