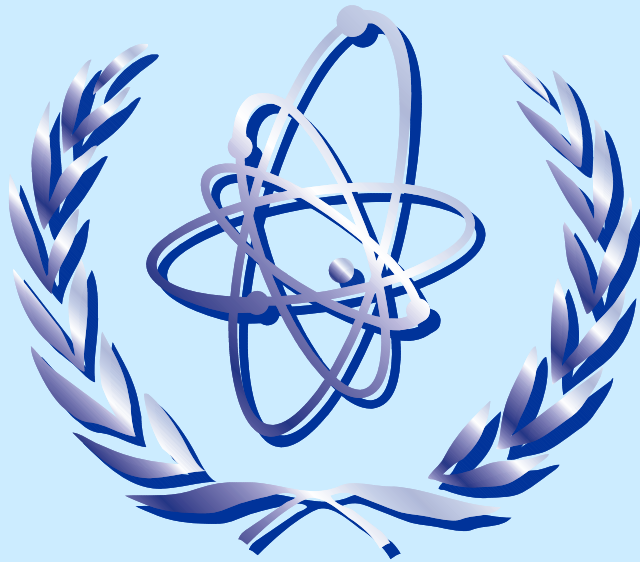


IAEA Training in level 1 PSA and PSA applications

PSA Project



QA Programme for PSA



Content

- **Why a QAP for PSA ?**
- **MANAGEMENT**
- **PERFORMANCE**
- **ASSESSMENT**



Why a QAP for PSA ?

- **“PSA is a tool of increasing importance that may influence design and operation of NPP”**
- **QAP is an essential tool of good management and is fundamental to achieving a quality PSA**



QA Programme for PSA

MANAGEMENT **Q.A.Programme**

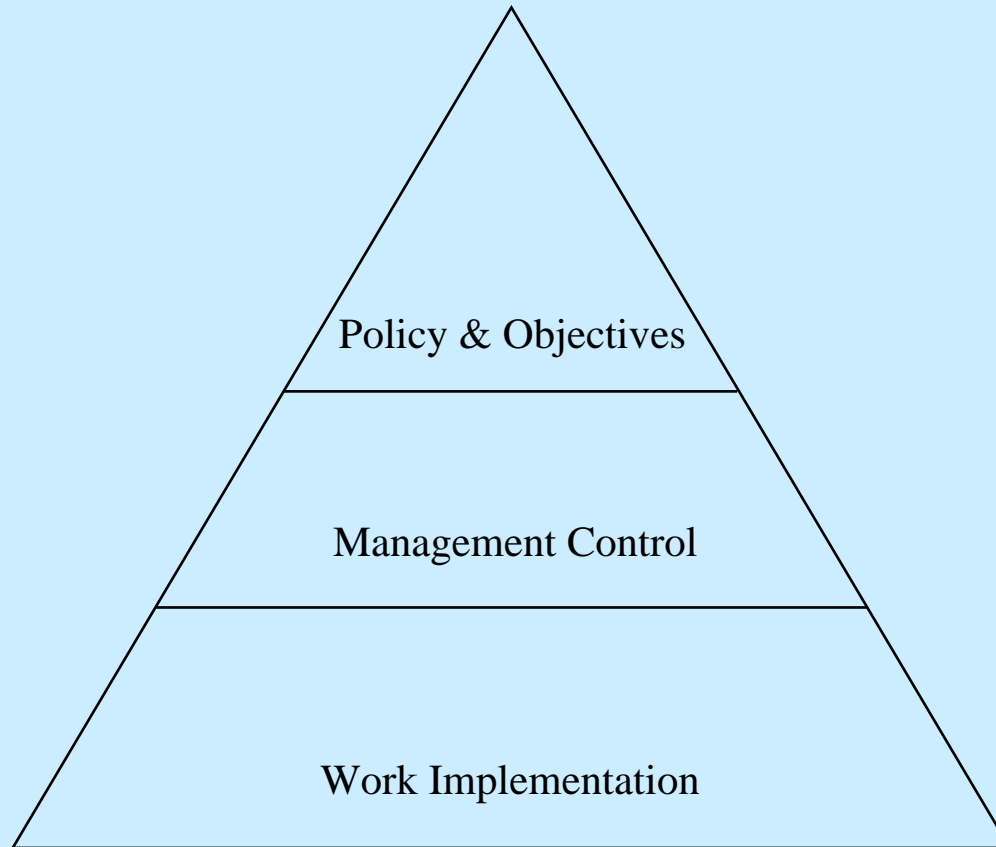
- **Understanding plant design & operation**
- **Clear objectives & purpose of PSA**
- **Planned scope and depth**
- **Methodology & data to use**
- **Organisation & expertise of team & leaders**
- **Document configuration management**
- **Thorough interface control**
- **Comprehensive technical review**



QA Programme for PSA

MANAGEMENT

Q.A.Programme documentation structure





MANAGEMENT

Q.A.Programme documentation (1)

- **QA Programme description**
 - **Overall statement**
 - **Objectives & Requirements**
 - **Organisation & Resources**
 - **QA Programmes integration**
 - **Communication & Interfaces**
 - **Required training & expertise**
 - **QAP assessment**
 - **Review**



MANAGEMENT

Q.A.Programme documentation (2)

- **Management Documents**
 - **Planning & Scheduling**
- **Working Documents**
 - **H.R. analysis**
 - **System analysis**
 -



MANAGEMENT ORGANISATION

- **Originating organisation**
 - **QAP establishment**
 - **PSA project plan**
 - **Technical review involvement**
 - **Report approval**



MANAGEMENT INTERFACES

- **Internal interfaces**
- **External interfaces**



MANAGEMENT STAFFING, TRAINING , QUALIFICATION

- **Plant knowledge**
 - **Plant operation**
 - **Plant maintenance**
- **PSA techniques knowledge**
 - **Thermal-hydraulics, modelling, HR PSA software,**



MANAGEMENT PLANNING

- **Earliest opportunity before start**
- **Project Plan preparation**



QA Programme for PSA

MANAGEMENT NON CONFORM. CTRL. & C. ACTION

- **Focus on immediate safety impact**
- **Systematic control**
- **Corrective Action when necessary**



MANAGEMENT DOCUMENT & INFORMATION CONTROL (1)

- **Information available at start**
 - **Scope, Input data, Previous calculations**
- **In process documentation**
 - **Assumptions, Source traceability, Changes**
- **Output documents**



MANAGEMENT DOCUMENT & INFORMATION CONTROL (2)

- **Availability of plant information**
 - **System to receive or make available plant information**
 - **Cut date for consistency**



MANAGEMENT DOCUMENT & INFORMATION CONTROL (3)

- **PSA update subject to equivalent QAP**
 - **Error correction**
 - **Refinement of assumptions**
 - **Revision of input data**
- **Simulations clearly segregated**



MANAGEMENT CONFIGURATION MANAGEMENT (1)

- Ensure that models, data, specifications, verification, documentation & software is mutually identified and at known status
- Record changes in configuration status
- Keep team updated on latest changes in PSA information (software, models, tree attributes....)
- Model version control as per procedures



MANAGEMENT CONFIGURATION MANAGEMENT (2)

- **IDENTIFICATION of CONFIGURATION**
 - Project info subjected to status control
 - Software and e-info subjected to configuration control
 - Keep track on purpose of each version
 - Establish a baseline
 - Changes incorporated into baseline



QA Programme for PSA

PERFORMANCE

QA OF INPUTS QA OF TASK PERFORMANCE QA OF TASK OUTPUTS

Verification of compliance with task instructions

Verificacion of results acuracy

Compliance with requirements for other tasks

X	X	X
X	X	X
X	X	X



PERFORMANCE VERIFIED INPUTS

- **Control of external inputs**
- **Control of internal inputs**
- **QA process before released for use or**
- **Obtained from recognised source & evaluated**



QA Programme for PSA

PERFORMANCE VERIFIED COMPUTER CODES

- **All computer codes verified and validated**
 - **By vendor (commercial codes)**
 - **Internal QA measures (when internal)**



PERFORMANCE

V&V of analytical work products

- **Verification of system models**
 - **Verification performed by competent personnel**
 - **Not involved in original work**
 - **Planned performance**
 - **Consideration to intermediate results when appropriate**



PERFORMANCE **PSA Reviews**

- **Different types of review**
 - ◆ **Informal (self review)**
 - ◆ **Supervisor review**
 - ◆ **Independent review**
 - ◆ **Specialist review**
 - ◆ **External review**



PERFORMANCE **PSA Change Control**

- Same controls as original PSA
- Document reason for change
- Typical controls involve:
 - Information control
 - Configuration control
 - Document control
 - V & V , review



PERFORMANCE PSA OUTPUTS

- **According to PSA procedures**
 - (see “Procedures for conducting PSA of NPP level 1” 50-P-4)



ASSESSMENT

- **Self assessment**
- **Independent assessment**
- **Aspects to be assessed:**
 - **Completeness**
 - **Consistency**
 - **Accuracy**
 - **Document control**
 - **Configuration control**



References

- **IAEA-Safety Series 50-P-4 Procedures for Conducting Probabilistic Safety Assessments of Nuclear Power Plants (Level 1)**
- **IAEA-TECDOC-1101 Framework for a quality assurance programme for probabilistic safety assessment**