SAT IN ENGINEERING SUPPORT PERSONNEL TRAINING

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S.A.T. Seminar

S.A.T. in Engineering Support Personnel
Objectives

I. Main tasks of 7 types

II. Brief description of "Simplified"

III. Advantages and disadvantages

Type 7

Determinations of which model

Model arrived at 4 PM.

Real example of "Simplified"

Simplified

of both types (complete & summarized)

SAT Approach

1. Objetives
3.1 REACTOR ENGINEER
This section describes activities commonly performed by the reactor engineer.

- Perform post-scram analysis.
- Prepare control rod withdrawal/insertion sheets.
- Assess core conditions to identify or confirm a degraded core, including abnormal geometry.
- Support a failed fuel action plan.
- Input core operating data into core follow program.
- Evaluate core follow reports for long-term trends.
- Develop a core shuffle and component shuffle sequence.
- Prepare a core physics test plan.
- Evaluate core physics test data.
- Monitor core performance during startup and periodically during operation.
- Perform a routine weekly reactor core surveillance and evaluate the results.
- Perform a core performance computer software safety review.
- Verify data input and updates.
- Determine the life expectancy of expendable core components.
- Perform individual responsibilities as a member of the site emergency response team.
3.2 IN-SERVICE INSPECTION (ISI) ENGINEER

This section describes activities commonly performed by the ISI engineer.

- Determine the applicable ISI requirements for selected plant systems and components.
- Develop ISI test procedures.
- Evaluate ISI test results to ensure conformance with acceptance criteria of applicable documents.
- Perform individual responsibilities as a member of the site emergency response team.
3.3 PERFORMANCE/RELIABILITY ENGINEER
This section describes activities commonly performed by the performance/reliability engineer position.

- Establish the acceptable performance levels for systems and equipment included in the performance/reliability program.
- Evaluate testing intervals using applicable vendor recommendations, operating experience, and equipment performance history.
- Evaluate test data to verify test acceptance criteria are met.
- Determine equipment operability and performance based on test results.
- Evaluate the trend and performance of a system and/or piece of equipment.
- Prepare a performance/reliability engineering analysis for a modification or test.
- Develop a reliability model for a safety system to be used to evaluate equipment performance, proposed modifications, test intervals, and operating practices.
- Test and evaluate the thermal performance of the overall plant, key systems, and components.
- Perform individual responsibilities as a member of the site emergency response team.
3.4 SYSTEM ENGINEER/MAINTENANCE ENGINEER
This section describes activities commonly performed by the system engineer/maintenance engineer.

- Monitor operation and maintenance activities of assigned systems and components.
- Evaluate system performance to improve efficiency and reliability.
- Determine preventive and predictive maintenance requirements for selected systems and equipment.
- Develop maintenance, surveillance, and other test procedures.
- Conduct walkdowns of assigned systems.
- Prepare, provide technical support, and document special tests as may be required for evaluation of system performance or to determine the cause of system malfunctions.
- Observe ongoing work and identify practices that are inconsistent with quality workmanship and industrial and radiological safety practices.
- Identify system and equipment problems and initiate appropriate corrective actions.
- Analyze system and equipment failures for root causes.
- Specify post-maintenance test requirements.
- Perform technical reviews of temporary modifications and conduct safety evaluations.
- Assist in the preparation and review of design change packages, installation procedures, and testing procedures.
- Assist in the investigation of reportable occurrences or significant operating events.
- Assure maintenance of the environmental and seismic qualification of plant equipment.
- Evaluate isolation boundaries for complex safety tag-outs.
- Perform individual responsibilities as a member of
3.5 STATION MODIFICATION ENGINEER

This section describes activities commonly performed by the station modification engineer.

- Prepare a station modification package.
- Develop modification conceptual designs.
- Evaluate detailed modification designs.
- Test modifications.
- Prepare a safety evaluation for a modification.
- Review proposed temporary modifications and jumpers, including technical and safety reviews (10CFR50.59) and safety evaluations.
- Periodically evaluate temporary modifications to determine continued need.
- Review setpoint and computer software changes.
- Perform individual responsibilities as a member of the site emergency response team.
3.6 QUALITY ASSURANCE (QA) ENGINEER

This section describes activities commonly performed by the quality assurance engineers.

- Develop a surveillance plan and method.
- Observe a surveillance test and evaluate the process and results.
- Perform QA review of engineering modification documents.
- Perform QA review of work order documents.
- Perform QA review of procurement documents.
- Perform individual responsibilities as a member of the site emergency response team.
3.7 REGULATORY COMPLIANCE ENGINEER

This section describes activities commonly performed by the regulatory compliance engineers.

- Review proposed plant modifications to verify compliance with license requirements.
- Review procedures and procedure changes to verify compliance with license requirements.
- Observe plant conditions and evolutions to verify compliance with license requirements.
- Verify compliance with technical specification surveillance requirements and other required surveillances.
- Review/screen industry operating event reports, notices, and bulletins for plant applicability.
- Develop a license change recommendation.
- Assist in the investigation of reportable occurrences or significant operating events.
- Perform individual responsibilities as a member of the site emergency response team.
SUMMARY OF FACTS
ABOUT S.A.T.

*C.N ALMARAZ: 23 JOB POSTS—8 YEARS
(FIRST ONE DEVELOPED)
*REDUCED METHOD
(CORRELATION PROCESS)
276 JOB POSTS: 7 MONTHS

*TYPICAL NUMBER OF TASKS:
REACTOR OPERATOR: 400
ENGINEERING JOB: 15 (MACROTASKS)
MAINTENANCE: 40–50 TASKS

TIME DEVOTED TO ERT(JPM):
USA: 1,2T/D/M
SPAIN(AMA): 1,5T/D/M

SAT (COMPLETE PROCESS)
ATUCHA(ARGENTINA):
7 JOB POSTS: 15 MEN 1 YEAR
(ONLY ANALYSIS&DESIGN PHASES)
15 ANALYSTS, ONE DATA BASE MANAGER
2 SW/HW EXPERTS
SUMMARY OF FACTS
ABOUT S.A.T.

HUNGARIA: 10 JOB POSTS FOR MAINTENANCE.
(SIMPLIFIED SAT): 2 YEARS

COMPLETE SAT: 1,5T/D/M

SIMPLIFIED SAT: 8T/D/TOP TABLE
ANNEXE III - FLOWCHART OF THE DIFFERENT METHODS PROPOSAL BY TECNATOM TO DEVELOP A SAT

COMPLETE

JOB DESCRIPTION

PERFORM BY ANALIST

TASK DESCRIPTION

K/S/A BY TASK

USING K/S/A TAXONOMIE CODE

ERT (JPM) BY TASK

USING SAT PROCESS MANAGEMENT DATA BASE (GESFORM)

COMPETENCE BY JOB POSITION

COMPETENCE BY TRAINING SETTING AND JOB POSITION

INDEX BY TRAINING UNIT

USING TRAINING DEVELOPMENT DOCUMENTATION PROCEDURES

TRAINING DOCUMENTATION

SIMPLIFIED

JOB DESCRIPTION

PERFORM BY ANALIST

TASK DESCRIPTION

K/S/A BY TASK

USING K/S/A TAXONOMIE CODE

ERT (JPM) BY TASK

USING COMPETENCE TAXONOMIE CODE

PERFORM IN TABLE TOP

COMPETENCE BY JOB POSITION

TERMINAL & ENABLING OBJECTIVES BY TRAINING SETTING

INDEX BY TRAINING UNIT

REDUCED

JOB DESCRIPTION

PERFORM BY ANALIST

TASK DESCRIPTION

K/S/A BY TASK

USING COMPETENCE TAXONOMIE CODE

TERMINAL & ENABLING OBJECTIVES BY TRAINING SETTING

INDEX BY TRAINING UNIT

USING TRAINING DEVELOPMENT DOCUMENTATION PROCEDURES

TRAINING DOCUMENTATION
ANNEXE I
PROPOSAL SAT SEQUENCE

OCCUPATIONAL ANALYSIS (TRAINING NEEDS)

JOB ANALYSIS

TASK ANALYSIS

REFERENCE TAXONOMIE CODE

COMPETENCE (K/S/A)

VS COMPETENCE

CATEGORIES

( TO HELP ANALIST
TO OBTAIN K/S/A BY
TASK IN A OBJECTIVE
WAY )

(Task (Does not Analyse))

(Task (To Analyse))

(To help analyst
obtain K/S/A by
task for
very complicated
job)

COMPETENCE

OF A JOB POSITION

(K/S/A BY CATEGORY
OF COMPETENCE)

ELEMENTS OF COMPETENCE (GOALS)

(General state what will be a common
prism for K/S/A of Compet. Categ.)

TERMINAL OBJECTIVES (WHAT TO KNOW?)

Categories:
Cognitive (Knowledges)
Psychomotor (Activity)
Affective (Attitude)

Contents:
Verb describing the learning required (essential)
Content of skill component (essential)
Required performance level of learning (optional)
Any conditions under which learning is to take place (optional)
We say that someone owns "professional competence" when he owes the knowledge, skills and aptitudes needed to develop a profession in order to solve the professional problems in a self-sufficient and flexible way and when he is training to collaborate in the professional environment and in the work organization.

- **Categories of competence**

  Contents of the professional competence.

  The category of competence can be different according to the own organization needs.