The Systematic Approach to Training

Kent Hamlin
Director, Accreditation
Institute of Nuclear Power Operations

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Systematic Approach to Training

- Analysis
- Design
- Development
- Implementation
- Evaluation
Objectives

- Describe the SAT approach to training
  - Analysis
  - Design
  - Development
  - Implementation
  - Evaluation
- Organize SAT efforts for success
- Stimulate manager involvement
- Study performance problems using SAT
Systematic Approach to Training

- **SAT** (Systematic Approach to Training)
- **TSD** (Training System Development)
- **ADDIE** (Analysis, Design, Development, Implementation, Evaluation)
- **ABCD** (Accomplishment-Based Curriculum Development)

\[ SAT = TSD = ADDIE = ABCD \]
## What’s the Difference?

<table>
<thead>
<tr>
<th></th>
<th><strong>Education</strong></th>
<th><strong>Performance-based</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>defined by teacher</td>
<td>defined by analysis</td>
</tr>
<tr>
<td>Objectives</td>
<td>general</td>
<td>specific</td>
</tr>
<tr>
<td>Tests</td>
<td>shotgun</td>
<td>rifled</td>
</tr>
<tr>
<td>Training</td>
<td>meet instructor needs</td>
<td>meet learning objectives</td>
</tr>
<tr>
<td>materials</td>
<td></td>
<td></td>
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<tr>
<td>Lesson plans</td>
<td>variable</td>
<td>required</td>
</tr>
<tr>
<td>Standards</td>
<td>relative</td>
<td>absolute</td>
</tr>
<tr>
<td>Grades</td>
<td>normal</td>
<td>skewed (high)</td>
</tr>
<tr>
<td>Instructor</td>
<td>authority</td>
<td>leader</td>
</tr>
<tr>
<td>Feedback</td>
<td>informal</td>
<td>programmatic</td>
</tr>
</tbody>
</table>

*Education** is defined as teaching content, objectives, tests, training materials, lesson plans, standards, grades, instructor authority, and feedback. Performance-based instruction focuses on analysis, specific goals, rifled tests, meeting learning objectives, and programmatic feedback.**
• Endorses a Systems Approach to Training (SAT)
  – Portions of the license exam come from the SAT-based training program
Nuclear power plant personnel

Must use SAT to train and qualify:

- Maintenance (I&C, Electrical, Mechanical)
- Radiological protection technician
- Chemistry technician
- Engineers
- Non-licensed operator
- Reactor operator
- Senior reactor operator
- Shift technical advisor
- Shift supervisor
Customer Service

- Training managers care about plant performance
- Line managers care about training performance
Evaluation

- Monitor indicators
- Analyze data
- Identify and make improvements
- Apply operating experience
Example Indicators

↑ Worker performance
↑ Attendance
↑ Management observations
↑ License exam scores
↑ Station goals
↓ Radiation exposure
↓ Worker errors
↓ Maintenance rework
Analyze Data

• Monitor operating experience
• Confirm effectiveness of training
• Copy best practices
• Improve performance
• Enhance efficiency
• Respond to changing conditions
Effective and Efficient Training Programs

First Place

- Management influence
- Business demands
- Training evaluation
- Economies of scale
- Skilled training staffs
- A variety of training techniques
Success Factors
(Evaluation)

• 360° ownership
• Operating experience
• Self assessments
• Training effectiveness evaluations
• Training management committees
• Corrective actions completed
• Changes to initial and continuing training
Analysis

• Needs analysis
• Job analysis
• Task analysis
Needs Analysis

Possible Action
• supervision
• procedures
• plant mods
• other
• training

• Provide more supervision
• Revise the procedure
• Modify the plant
• Consider other options
• Provide training
• Obtain line ownership of action
Training Solution

• Team decision
• Considered after other alternatives
• Projected results
  *What do you want to improve?*
• Is not always the right solution
General Rule

If a person can perform the task when absolutely necessary, then training is not generally the best solution.
General Rule

If possible, modify the process, procedure, or equipment to remove the chance of error.

Consider possible consequences – avoid introducing errors.

Challenge “workarounds”
Faulty Needs Analysis

- False confidence the problem is fixed
- Error traps remain
- Can have repeat events
- Consequences
- Unsatisfied need
Perspective

- Program level
- Comprehensive
- Roles of:
  - Supervisors
  - Incumbents
  - Procedures
  - Templates
- Use
Job Analysis

- Plant procedures
- References
- Workers
- Supervisors
- Similar plants
Select Tasks for Training

- Difficulty
- Importance
- Frequency
Task Analysis

- What? = task
- When? = conditions
- How well? = standards
- References
- Procedures
Success Factors (Analysis)

- Customer focus
- Valid needs
- Projected return
- Responsive
- Efficient
Design

- Prepare learning objectives
- Develop test items
- Organize objectives
- Select training activities & methods
- Write tests
- Develop job performance measures (JPMs)
- Write training plan
Job Performance Measures

- Performance test
- Administered after:
  - prerequisites
  - training
- Performance standards
- Used for task qualification
Learning Objectives

• Define what the trainee will know and be able to do after training
• Used to develop tests
• Guides the training program content
Tests

- Check that students learned the material
- Based on the learning objectives
Organize Learning Objectives

• Simple to complex
• Logical relationships
• Makes training more efficient
• Guides the learning
• Team activity
Variety of Training Techniques
Develop Training Plan

- Procedures
- Schedule
- Training Settings
  - Classroom
  - Lab
  - Simulator
  - OJT
Success Factors
(Design)

- Clear learning objectives
- Learning objectives organized and linked to tests
- Training settings identified
- Customer review and approval of JPMs and learning objectives
Development

- Produce training materials
- Practice teach
- Revise as needed
Select Existing Materials

- Operating experience
- *Training Resources Catalog*
- *Generic Fundamentals Test Item Catalog - PWR & BWR Operator*
- Video materials
- Computer-based training
- *Industry guidelines*
- Other training organizations
Produce New Materials

- Development time
  - classroom
  - laboratory
  - simulator
  - in-plant
- Techniques
- Activities
Practice Teach

• Test the materials
  – Line managers
  – Instructors
  – Trainees

• Lets managers see the training before it is taught to workers

• Revise as appropriate
Success Factors
(Develop)

- Use existing materials
  - Regional training groups
- Operating experience understood
- Good quality materials
- Customer approval of training materials
Implementation

- Conduct training
  - classroom
  - laboratory
  - simulator
  - on-the-job
- Evaluate students & instructors
- Maintain records
Conduct Training
Evaluate Students & Instructors

- Verify students meet learning objectives
  - Exams, lab, etc.
- Observe instructor performance
  - Manager observations
- Identify opportunities for improvement
Maintain Training Records

- Attendance
- Test scores
- Training completed
- Qualifications
- Training materials
- Other
Success Factors (Implementation)

- Instructor selection
- Transfer people between training and other plant departments
- Instructor and student performance evaluations
- Continuing instructor training