SAT vs. Conventional one: Comparison and Benefits

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- **Date of Birth:** 11 June 1955
- **Education and Specialized Training:**
  - Moscow Engineering Physics Institute, M.S.
  - Post-graduate studies
  - Strategic Management and Marketing
  - SAT
- **Fields of Nuclear Training Activities:**
- **Work Experience:**
  - 20 years with Nuclear Training
  - Projects in Russia, Ukraine, Slovakia, Bulgaria, Hungary, Pakistan, Lithuania
  - Worked with 15 Nuclear Power Plants and Enterprises
  - Expert Services for the IAEA and International Initiatives

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Objectives and Expectations:

- To discuss main features distinguishing a SAT-based training system from a conventional training system.
- To introduce expected training-related benefits of SAT implementation.
- To discuss expected improvements for the utilities resulting from SAT implementation.
- To state major responsibilities of the utility staff in the development and upgrade of the personnel training system.

(to be continued)

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Objectives and Expectations
(continuation)

- For the Workshop (WS) participants to be able to complete SAT Advantages’ evaluation form.
- In the medium-term, for the WS participants to evaluate the status of a SAT application or applicability at their NPPs / utilities / operating organizations.
- In the long-term, for the WS participants to be able to conduct the seminars or presentations on the SAT-based personnel training / qualification processes.

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Main features distinguishing a SAT-based training system from a conventional one

Requirements for personnel competency, training, and qualification

<table>
<thead>
<tr>
<th>Conventional training system</th>
<th>SAT-based training system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuzzy, large job descriptions. Fuzzy task statements in procedures. Fuzzy procedures to qualify personnel and assess knowledge by means of vast examinations.</td>
<td>Short job descriptions plus complete clear task list. Specific criteria to assess job performance. Assessment of knowledge only necessary to perform tasks.</td>
</tr>
</tbody>
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Identification of training needs

<table>
<thead>
<tr>
<th>Conventional training system</th>
<th>SAT-based training system</th>
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</thead>
<tbody>
<tr>
<td>Not systematic; mostly based on standard training programs.</td>
<td>Clear and well organized technology to analyze training problems. Constant feedback to personnel training.</td>
</tr>
</tbody>
</table>
Main features distinguishing a SAT-based training system from a conventional one

### Training objectives and assessment of their achievement

<table>
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<tr>
<th>Conventional training system</th>
<th>SAT-based training system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent or fuzzy. Standards are practically absent.</td>
<td>Exist and are consistent with required competencies. Standards are established and known both to a trainee and to an evaluator.</td>
</tr>
</tbody>
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Main features distinguishing a SAT-based training system from a conventional one

### Training materials and instructors

<table>
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<th>Conventional training system</th>
<th>SAT-based training system</th>
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</thead>
<tbody>
<tr>
<td>Focus on training material development. Strong dependence upon individual judgments of instructors.</td>
<td>Focus on explicit training objectives. Instructors activities are directed by training objectives, lesson plans, and training materials with appropriate content.</td>
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Main features distinguishing a SAT-based training system from a conventional one

<table>
<thead>
<tr>
<th>Cost-effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional training system</strong></td>
</tr>
<tr>
<td>Is not considered.</td>
</tr>
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</table>

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Expected Training-related benefits of SAT Implementation

- Clear requirements for personnel competency. Personnel duty areas, tasks, performance and knowledge standards, approved by plant managers.

- Ensuring the achievement of required competency. Implementation the QA/QC of training, as a part of overall plant Quality Assurance Programme and Quality Control System.

*(to be continued)*

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Expected Training-related benefits of SAT Implementation  (continuation)

- Recommendations to improve job descriptions and procedures.
- Recommendations to modify plant systems/equipment, to improve working environment, to upgrade organizational structure.
- The trainee will know what to expect from training, established standards, and the results of the training.

(to be continued)

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Expected Training-related benefits of SAT Implementation  (continuation)

- The trainer will clearly know what to teach and the results of the training.
- The assessor will clearly know what and how to measure.
- The manager will clearly know the content and the results of the training.
- Development and upgrade of all aspects of training system: training materials, training tools, facilities.

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Expected improvements for the utilities resulting from SAT implementation

- Plant regulations, job descriptions, and procedures
- NPP organizational structure and human resources management.
- Human Performance Evaluation System.
- Recruitment procedures.
- Quality Assurance and Quality Control.

(to be continued)

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Expected improvements for the utilities resulting from SAT implementation (cont.)

- Mutual understanding of management and their subordinates.
- Requirements for the contractors providing training services are well defined.
- Working contacts with the regulatory body, public, and international missions.

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Training impact on job performance
A study for a non-reactor nuclear facility
(Dr. R. W. Klemm, 1994)

What is the performance difference between TRAINED and NON-TRAINED workers?

Answer:
The overall performance difference between the two groups (as measured by management and supervision) is +2.48 points on a 0 to 9 scale. When this rating is converted to Standard Deviations above/below the Average Job Performance, it signifies an average of 44% Job Performance improvement for the TRAINED worker.

(to be continued)

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Training impact on job performance
A study for a non-reactor nuclear facility (Dr. R. W. Klemm, 1994) (continuation)

What is the dollar value added (gain or loss) of the performance-based training programs used to train workers for their jobs?

Answer:
The dollar value of TRAINED operators is $59,155 per operator. This value would provide a payback period of one and a half years even if no other operators were TRAINED in that period of time.

(to be continued)

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Training impact on job performance
A study for a non-reactor nuclear facility
(Dr. R. W. Klemm, 1994) (continuation)

- What is the dollar value added (gain or loss) of the performance-based training programs used to train workers for their jobs?

Answer:
Projecting the same dollar gains for untrained operators in two of the three facilities and given their larger operator population of ~ 150 operators, the monetary performance value gain would be $8,873,250 a year.
(to be continued)

Cost/benefit analysis of nuclear training programs
(Dr. R. W. Klemm, 1992)

- The results of the study indicated that there was a significant difference in job performance of highly trained and moderately trained nuclear maintenance workers.

- The models used yielded a 24% increase in job performance and from a $1,476 to a $6,760 savings per trainee after training program costs had been removed.
Responsibilities of the utility/plant staff in the development and upgrade of the personnel training system

The utility/plant managers committed personally to:

- Know basic SAT principles.
- Exercise responsibility for the quality of training programs (that should be stated in their job descriptions).
- Analyze personnel training problems on a regular basis.

(to be continued)

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Responsibilities of the utility/plant staff in the development and upgrade of the personnel training system  

(continuation)

The utility/plant managers committed personally to:

- Take necessary actions in relation to the urgency, criticality, and attainability of a problem solution.
- Participate in plant Training Review Committees (that should be established by Plant Manager directive).
- Establish criteria for the effectiveness of training.

(to be continued)

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Responsibilities of the utility/plant staff in the development and upgrade of the personnel training system (continuation)

The utility/plant managers committed personally to:

- Participate in training observation and evaluation.
- Issue plant documents stating the policies for personnel training.
- Provide time for personnel training as needed.

(to be continued)

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Responsibilities of the utility/plant staff in the development and upgrade of the personnel training system (continuation)

The utility/plant managers committed personally to:

- Allocate necessary financial resources.
- Develop and establish optimal procedures to staff the training department, using full-time instructors, a system of personnel rotation, and adjunct instructors from the plant.

(to be continued)

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Responsibilities of the utility/plant staff in the development and upgrade of the personnel training system (continuation)

The utility/plant PERSONNEL are committed to:

- View training and maintenance of qualifications as one of their main activities.
- Participate in training development; beginning from the Analysis phase through to Training Evaluation.

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Key Considerations

- Strange though it may seem, but SAT works hard and efficiently.
- An approach provides the principles or methodology. Specific SAT model describing the TECHNOLOGY should be customized and used.
- MAKE IT YOURS! 

(to be continued)

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Key Considerations (continuation)

- Qualitative constructive analysis has convincingly showed the advantages of SAT-based training, but...
- While completing the Evaluation Form you will hopefully find the preconditions to gain benefits.
- Design, Development, and Implementation take ~80% of the resources in our life, but Analysis and Evaluation provide ~80% of the gains...

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Key Considerations (continuation)

- So, conduct SAT Implementation phase, TRAIN personnel !!!!

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