

# OSART Good Practices

## TRAINING AND QUALIFICATION

### Training Policy and Organization

#### Kozloduy 1/4, Bulgaria

Mission Date; 11-28 January, 1999

The plant has developed a well-established recruitment system for university degree personnel. The plant has a permanent office in the country capital university, where they are seeking promising students and offering them fellowships and future employment. Students have the opportunity to spend some time occasionally working in the plant during their study period and thereby become more familiar with the company. In addition, the plant maintains a data base about the potential new employees, willing to get employment in the plant. Currently they have about 2400 applications for employment, while their needs are about 250 new employees per year.

As an example the radiochemistry department recently wanted to employ a new technician. The head of the department has submitted the request including the education prerequisites to personnel department. They have found about 100 matching records in their data base and sent them to the department head for consideration. He has selected the new employee after interviewing 10 candidates with highest marks at the university. With such a system in place the plant can at any time employ the best available people

#### North Anna 1/2, USA

Mission Date; 24 Jan-11 Feb, 2000

The Training Review Boards create a partnership between plant and training staff which contributes to line management ownership of training resulting in continuous improvement of the learning environment.

The Training Review Boards oversee training at the working level and consist of Superintendent (applicable discipline), Superintendent Nuclear Training, Supervisor Nuclear Training (applicable discipline), Supervisor (discipline), and other relevant people may be co-opted, as necessary. The review boards meet quarterly.

These review boards cover all site disciplines (eg. Operations, maintenance etc.) and meet regularly to discuss all aspects of training, training performance, changes to training programs, approval of programs etc. They lead to a very close relationship between site and training staff, examples of which are seen in the following areas:

- Subject-Matter Experts (SMEs) from site are routinely used to present training in all areas. Classes presented by the SME are attended by a qualified instructor. The qualified instructor intercedes and provides support as necessary to assure SME instructional effectiveness and consistent presentation of the subject matter;
- Training mockups and simulators, extensively used throughout the station, are provided using line department resources. For example, a mockup of the charging pump seal array was designed and manufactured by Station machinists that enables Mechanics to practice seal disassembly/ assembly prior to maintenance;
- Instructors regularly attend meetings on site, get involved in site projects and provide support to the outage.

## North Anna 1/2, USA

Mission Date; 24 Jan-11 Feb, 2000

The systematic approach to training is applied using a comprehensive training database, which is used effectively to enable timely, accurate, and cost-effective program design and maintenance of accredited training programs.

Performance-based training focuses instruction on a documented set of job performance outcomes and standards. Using a systematic instructional design process, all of North Anna's accredited training programs' job/task analysis information is integrated into an electronic data system to reflect the entire performance-based process. The software, known as "VISION," allows instructors to view a program's complete layout (analysis, design, and development), and quickly search, review, and retrieve training information and various documents from a desktop computer.

Job performance measures (JPMs) and randomly generated tests are produced from the VISION database. These documents are used to qualify trainees on program tasks. Within VISION, tasks are arranged under function (i.e., duty) areas. Below each task are its performance steps and the skills and knowledge (KSAs) associated with it. These KSAs are converted into cognitive objectives, and test items are created to evaluate them.

All test items for instructional material are electronically collected to form a question pool from which the VISION software can produce randomly generated tests. A table of specifications (a blueprint of an exam or exam bank) is produced to ensure all objectives are covered. This table provides a link between the objectives and the test items, as well as identifies the type of test items (e.g., multiple choice, essay, etc.) available in an exam bank or on a specific exam. If more than one version of a test is required, the software automatically scrambles distractors and/or selects different questions.

The primary advantage of the VISION software is the efficiency and consistency it provides. The test and document generation features allow instructors to perform routine development duties more quickly and easier than previous methods. Another advantage is that the same links that tie the data together provide a search trail for change management.

## North Anna 1/2, USA

Mission Date; 24 Jan-11 Feb, 2000

A bimonthly electronic magazine, The Idea Factory, is used to update instructors and helps to maintain and improve instructional knowledge and skills. It provides ideas and activities for application either in the classroom or in the development of training materials.

Instructors and staff from both sites (North Anna and Surry) and corporate contribute ideas and activities. Examples of things covered by the magazine include the following :

- Aids to making Power Point presentations;
- Simple safety presentations that can be cut and pasted into other longer presentations;
- Details on presentation techniques;
- Examples and meanings of confusing words;
- How to search the Internet for training material;
- Training games;
- Training examples and Operating Experience Feedback (OEF) from other industries.

## Belleville, France

Mission Date; 9-26 October, 2000

System of shadow training.

The shadow training system in the departments works on two levels. Firstly there is an organization set up for apprentices who are studying at schools or colleges. This is based on a sandwich course of four weeks on site and four weeks of study. The apprentice is guided through the time on site by a tutor who also liaises with the school teachers. There is a contract between the plant and the apprentice who is ensured of a job position if he successfully completes the course. Secondly, there is a similar system for new recruits to the department based on a plant policy document with a standardized three party contract between the manager, tutor and trainee. The tutor in the shadow training process receives the appropriate professional development training. In the same way as for the first system, the tutor uses a shadow training booklet with defined tasks and skills required for their new job. Progress in the activities is signed off by the tutor and the trainee as the objectives are achieved. Every two to three months an appraisal interview is held between the trainee and the manager. The whole process takes about two years to complete.

## Temelin 1/2, Czech Republic

Mission Date; 12 Feb.-1 Mar., 2001

Evaluation of training effectiveness takes place by means of three different kinds of evaluation sheets to be filled out.

- by training participants immediately after training.
- by training participants after some months of experiences on-the-job.
- by supervisors who participated in training.

Beside other relevant determinants indicators of safety culture are evaluated by the training participants.

## Lingao, China

Mission Date; 6-23 August, 2001

LNPS has conducted comprehensive job and task analyses for positions important to safe and reliable operations.

The LNPS has undertaken an effort to reinforce existing training programs through use of the Systematic Approach to Training (SAT). The five production departments each have their own approach to analysis of training needs, based upon IAEA guidance on the Systematic Approach to Training (SAT). Comprehensive job and task analysis have been completed for almost all LNPS positions except for managers and some supervisors. The results of these analyses are being used to upgrade job descriptions, selection criteria, performance appraisals, training programs and plant procedures. Particular positions were selected as pilot projects for design, development and implementation of SAT-based training. The LPH Branch initiated the first LNPS SAT pilot project. In the case of operations, the blocking manager (assistant shift supervisor) position was selected for a pilot project. There has been broad participation in the analysis phase which has helped to create an atmosphere of learning. At LNPS, SAT is no longer regarded as a job for a few experts, but instead is a practice participated by each person, with benefits for all.

## Tricastin, France

Mission Date; 14-31 January, 2002

Since the Tricastin NPP has focused their attention on the improvement of training and established and implemented a monitored action plan, multiple methods are in use to ensure skills attached to tasks are met and maintained. During the review process it was noted that the maintenance of job functions are not based entirely on traditional type training courses. A specific policy implemented in Tricastin NPP is to offer a variety of methods to trainees to maintain their skills and competencies. The plant supports its new recruits with a formalised tutoring and shadow training program based on trained tutors and shadow training booklets. Immersion programs are proposed and implemented to improve cross-functional experience and skills. A project-based training method has been developed where there is theory input followed by the development of a project for each trainee to develop and implement based on course work completed. This project is then presented, discussed and assessed by the training centre and management. Situational team training is then used for practising action sheets for all field staff. The strength of this system lies in the fact that team management follows the field staff and completes observation sheets during the training. Afterwards well constructed debriefing sessions use methods of active trainee participation to prod and encourage response focused toward improvement. Newly appointed managers are provided with coaching to ensure they are able to perform the oversight function of this process. As a part of this program the operational departments monitor infrequently performed and other unusual activities so that these skills are constantly maintained by task assignment rotation and by including the tasks into scenarios for simulator training. The networks set up for key functions such as human factor specialists, contractor monitoring supervisors and team leaders enable the participants to identify training needs, share their experience, brainstorm and solve problems.

## Tricastin, France

Mission Date; 14-31 January, 2002

Since 1992, Tricastin NPP has been implementing a program of trainer support to the NPP identified as the " Club des Formateurs à Temps Partiel " or the Part Time Trainers Club. This group of individuals is specially chosen from volunteers, provides training for all the training departments at the site, which allows the trainers to share their plant technical knowledge and experience. This program also provides a mechanism for strong operating experience feedback. There are currently seventy-six (76) part-time trainers in the club coming from all the departments within Tricastin NPP. They cover the fields of nuclear safety, first aid, environment, emergency plan, radiation protection, information systems and fire fighting. A " club " coordinator within the training enter manages the scheduling of the part time trainers, relations with the managers and training skills development. Although many personnel volunteer for the program only those demonstrating the appropriate skills and attitudes are chosen. The part time trainers use their training skills to enhance their career development at Tricastin NPP as possible future managers and supervisors, future full time instructors, future experts and advisors. In the year of 2001 three hundred and eighty (380) man days of training was provided to the training departments at the plant. The program is controlled, proceduralized, monitored and assessed on a routine basis to ensure the highest level of implementation. Each trainer has a personnel file maintained within the department and evaluations are performed. Plant management supports the program and as mentioned above this provides many days of training for plant staff through the use of their staff. At the present time this program is specifically implemented at Tricastin.

## Tianwan, China

Mission Date; 26 Jan.-12 Feb., 2004

The training engineers are embedded into the production branches to assist the branch managers to implement the training programmes for their personnel. Their role is to analyze the changing job tasks for the personnel and appropriately modify training programmes, and to analyze the performance of branch personnel and make appropriate corrections in their training programmes. This system facilitates establishing the effective training network which connect main elements of the training programme at TNPS. The tight contact with the Training Center from one side, and the direct involvement in the production branch activities on the other, provides good basis to immediately respond to the training needs in the branch using the methodology provided by the Training Center. The training engineers system is expanded to the shift level of where appropriate staffers are assigned as coordinators of shift personnel.

## Blayais, France

Mission Date; 2-19 May, 2005

Plant managers assess staff skills using a skills mapping tool.

Skill mapping involves using a table that helps work teams see clearly:

- individual skills categorised by type of activity
- overall collective skills, strengths and shortcomings, by comparing them to a set target value
- the likely evolution of individual skills over the coming years, focusing on each person's particular professional life-time plan (career development, retirement).

Analysis of this skills mapping allows managers to:

- better identify any specific skills needed
- anticipate the skills development action plans needed to ensure their teams' continuing ability to carry out their responsibilities.

Results achieved are:

- Analysis of the impact of retirement among I & C workers and adapting recruitment plans correspondingly (due to lengthy a training programme).
- Development of a plan for training electricians following a change in policy regarding the use of contractors.

This simple tool helps managers ensure their staff's skills match those required for operating the units.

## Brunswick, USA

Mission Date; 9-26 May, 2005

The training organization incorporates human performance training into all training sessions to reinforce management expectations and to improve worker performance. For example, all supplemental workforce personnel attend two hours of classroom human performance fundamentals training and two hours of lab exercises. The lab exercises consist of faulted plant work scenarios where the worker is asked to identify unacceptable plant or work conditions (i.e., FME, housekeeping, chemical control, confined space, etc.). These faulted scenarios are typically developed based on previous outage conditions which were identified as improvement opportunities.

Supplemental workforce personnel are also required to attend pre-outage human performance continuing training which typically consists of a review of OE from previous Brunswick outages as well as lessons learned from other utility outages. Prior to the outage, the 'Human Performance Steering Committee' participated in an INPO web cast meeting where plants shared outage related human performance issues. As a result of this meeting, Brunswick learned that other plants were seeing issues with the control of supplemental workforce as well as night shift personnel in general. Based on this feedback, targeted or focused observations were performed throughout the outage with an emphasis on night shift work and work being performed exclusively by supplemental workforce personnel.

Observation of work is a key element of improving human performance. A team of individuals composed primarily of training instructors is identified each year to conduct observations prior to and during the refueling outage to recognize negative as well as positive behavior. These observations are analyzed each shift and "real time" information is provided to the management team regarding potential emerging trends.

An example of this was this past outage when the observations revealed that workers were not wearing proper hand protection in contaminated areas. This information was shared with the workforce and managers and the condition was corrected within 24 hours.

## Brunswick, USA

Mission Date; 9-26 May, 2005

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The 'Training Advisory Board' (TAB) and the 'Training Programme Committees' (TPCs), which are sub-committees of the TAB, provide oversight and direction to the training section. They are very effective in ensuring that training is used to improve plant performance and is meeting the needs of the line organizations.

The TAB is chaired by the BNP vice president and attended by section-level management, training, and TPC representatives.

The TPCs are chaired by a line manager or supervisor and include incumbents and training personnel. They each address one or more related programmes and are the primary means of ensuring that training drives improvements in personnel performance at BNP.

When performance problems are identified that can be addressed by a training activity, or job incumbents identify additional areas where training can improve plant performance, they are documented on the TPC action plan. The action plan includes: a description of the performance improvement item, the desired outcome, action item assignments for the training interventions that will result in the desired outcome, a description of how training effectiveness will be determined, and a status/results section.

The action plan forms the core of an annual presentation by each TPC to the TAB. It is a tool for capturing and reporting improvements in personnel performance that are linked directly to training interventions.

## Ignalina, Lithuania

Mission Date; 5-21 June, 2006

As a part of the Ignalina NPP preparation for decommissioning, the systematic analysis of decommissioning personnel training needs has been done, including feasibility study of planning, design and development of a decommissioning training center.

The overall aim of the project was identification of training requirements to meet pre-decommissioning and decommissioning training needs in the short and medium term.

The project covered the following stages:

-Analysis of the Unit 1 expected decommissioning activities that require the training of the personnel. For each of identified field of activities the tasks were determined demanding the training of the personnel.

-Based on the tasks identified in the first stage, personnel training needs analysis was done as well as analysis of requirements for changing the existing training system with respect to the Ignalina NPP decommissioning. As a result, a training matrix was developed identifying number of people to be trained, number of trainers, the scope of training programmes and the projects for which they are to be trained.

-In the 3rd stage, needs of training center facilities, infrastructures, equipment and technical means including funding were analyzed.

International support and expertise was used in this project.

Such systematic approach to training for decommissioning phase of the plant life cycle done before real start of specific decommissioning activities can be considered as a good practice as it gives the plant an opportunity to prepare personnel with required qualification in proper timing and a cost-effective way.

Well thought-out organization of continuing training for operating shift crews employing the recreation activities for the personnel.

A continuing training programme for operating shift crews includes both training and health rehabilitation (at the specialized recreation facility). Annual continuing training for operating shift crews includes two training sessions, two weeks each. Every training day operating crew attends Training Centre only for four hours; the rest of the day the crew spends at the specialized recreation facility located at beautiful place close to the river. Personnel recover their health according to the individual prescriptions, including individual diet and rehabilitation activities. The recreation facility is equipped with different means for active rest: gym, sauna, and other premises for rehabilitation. An operating crew works in special conditions (rotating shifts, stresses, etc.); and it is crucially important for safety to provide a possibility to recover health during total four weeks per year. As a result of sport events the team spirit is developing, which is considered to be an important factor for safe operation. Such training programme arrangement allows also a significant increase of training effectiveness (it is well known fact that human ability to effectively receive information decreases significantly after four-five hours of intensive learning).

### On-line Training Management System

An on-line management system using business data processing software has been implemented at the plant. This system enables access to training services and allows the plant to effectively track personnel qualification.

Training and qualification records are centralized in a database, accessible from within the company network by all employees and their supervisors. Individual qualification records are linked within this system to the work planning process such that work planners are notified if they attempt to schedule work to be performed by individuals whose qualification has lapsed.

Initial and continuing training are scheduled as required by specific training programmes. However, complementary training courses are selected by the individual, approved by the supervisor and scheduled for implementation through this same system. Employees have the ability to select from courses already entered into the database or to input requests for new training services. The system displays a training calendar for each individual to assist in course scheduling. Enrolled students are automatically reminded of upcoming courses at one month before, one week before and one day before the scheduled class.

Important incoming documents are scanned on receipt and electronically distributed to responsible plant personnel through the work flow system integrated into this software. Managers and supervisors use this system to further distribute important information and operational experience items to their employees. This feature is just one of many customizations of the business software that has been further enhanced by Neckerwestheim personnel for use at the plant.

This system has resulted in better control of work processes through automatic personnel qualification verification. Delays in course scheduling have been reduced. The software facilitates re-scheduling because Central Services Training Section is automatically notified when courses are 80% full. Notification has enabled the training section to look ahead and schedule additional classes to accommodate need. Course attendance has been improved by automatic notifications sent to enrolled students.

### Training feedback evaluation process

Rivne NPP has implemented and managed effectively a unique training feedback evaluation process (Methodology for evaluation of the training 181-9-M-QA) for all the Rivne NPP personnel levels (from the level of the workers and field operators to the Director General Deputies). It represents an unusual and good approach to review the effectiveness of the training process and individuals' qualification. Also all evaluators have passed a special training programme about the training evaluation process.

The TC personnel receive special training on evaluation skills in the Engineering and Technical Center of Nuclear Personnel Training in Kiev. The programme for initial training of department managers (training for new job position) contains topics on methodology of the SAT and evaluation process. The operating shift personnel also receive such training within the frame of continuing training in TC. The above described evaluation practice was implemented at Rivne NPP in the period from 2004 to 2008.

The Methodology for evaluation of training (181-9-M-QA) covers the following aspects:

- Entry level evaluation of trainees' knowledge;
- Intermediate evaluation of knowledge;
- Exit level evaluation of knowledge after each stage of training (theoretical training, simulator training, on-the-job training);
- Assessment of training programmes;
- Assessment of training arrangement (questionnaire);
- Evaluation of instructors.

For specific operating positions the department managers perform the training feedback assessment at the plant 9-12 months after assumption of independent job performance by the trainees. Also the personnel training efficiency is assessed in external educational institutions.

In the course of the simulator training the operating personnel provide a self-assessment for simulator training session and also they evaluate their colleagues.

The important aspect of training quality assurance is a feedback process based on the training evaluation results. The feedback process ensures continuous monitoring of training indicators and criteria, and provides benchmarking against the established norms. The specially trained personnel in the Training Centre perform integrated analysis of training efficiency, develop the corrective measures, aimed at improvement of the training components and entire training system at the Rivne NPP. The information about the training evaluation results is communicated to all people involved in the process (managers of all levels).