"OSART Mission Highlights Related to On-the-Job Training"

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at the IAEA Specialists' Meeting on
On-the-Job Training and Qualification of Nuclear Power Plant Personnel
4-6 December 1995

This paper summarizes the highlights, related to the topic of on-the-job training (OJT), for Agency OSART missions conducted since 1990 (a total of 27 missions). Recommendations and suggestions for improvements related to on-the-job training and qualification programmes are discussed, as well as Good Practices and Good Performances. For Good Practices and Good Performances, the plant is identified to aid in follow-up by meeting participants. For recommendations and suggestions, the number of plants that had recommendations/findings in this area are identified by a number in parentheses after the item. The paper takes a broad approach toward highlights that are related to OJT. For example, there have been a number of OSART recommendations and suggestions concerning responsibilities, authorities and interfaces for NPP activities. These recommendations and suggestions relate not only to responsibilities and interfaces for on-the-job training and qualification programmes, but also to other areas as well.

The information contained in this paper was developed from a data base called OSMIR, using the Microsoft Access 2.0 programme. The data base is available from the Agency on diskette, free of charge. Contact M.A. Domenech, IAEA, NOSS-NENS, Wagramerstrasse 5, PO Box 100, A-1400 Vienna, Austria Fax: 43-1-20607, Phone: 43-1-2060-22031.

Management Roles and Responsibilities

↓ Responsibilities, authorities and interfaces among organizational units for training and qualification and other plant activities are not clearly defined. (5)

↓ Senior plant management does not perform periodic observations of training at the plant or at the training centre. (4)

↓ Departments, and in some cases individual first line supervisors, are responsible for the development and delivery of training programmes for their own personnel. There is no mechanism to enforce a standard of quality, or to avoid redundancy (4)

↓ There is no one responsible for the coordination of all on- and off-site training, drawing up training schedules, maintaining training records, and assisting departmental managers in discharging their responsibilities (2)

↑ The station training committee was created to coordinate general policies and activities for individual training programmes. It will increase the consistency of training and help communications between departments about training matters (Fessenheim 1/2-France)

↑ In order to ensure that training programmes are implemented and that line managers are involved in the training process, a Training Review Group for each section has been established that meets at least quarterly. The group is composed of personnel from the Training Section and from the corresponding work group. (Grand Gulf-USA)

Use of Procedures for the Conduct of Plant Activities

↓ There are either no written instructions/procedures for the conduct of plant activities, or the existing instructions are inadequate (8)

↓ There is no evidence that procedures are being updated, nor is use being made of experience feedback to improve procedures (3)

↓ Procedures are not routinely used for the conduct of plant activities (5)

↓ The required personnel qualification and estimate of work duration are not included in plant procedures, nor is this type of information tracked in the computerized work control system. (1)

↑ The procedures used to accomplish the maintenance programme are excellent documents with very precise details for performance of the job. They compare favourably with the best maintenance procedures of many other plants in the world (Fukushima Daini-Japan)

Qualification of Plant Personnel

↓ There is no structured assessment of skills before qualification of NPP personnel (6)

↓ There are no task-specific qualifications of plant personnel to aid supervisors in making job assignments (2)

↑ An Individual Training Qualification (ITQ) card is given to each person at the plant by the Training Records Group. The ITQ card indicates those courses required by each qualification category and their expiration dates. Employees use the ITQ cards to schedule their training and to demonstrate its successful achievement. (Grand Gulf-USA)

↑ Every contractor welder is required to pass a plant test on his welding skills, in addition to performance qualification required by applicable codes and standards. (Leibstadt-Switzerland)

Training Records

↓ A comprehensive training records system is not established to allow identification of initial and refresher training needs (3)

↑ A qualification booklet for both initial and continuing training is issued to all radiation workers (both plant personnel and contractors). This booklet provides common standards throughout the country for workers who move from one site to another. (Fukushimo-Daini, Japan)

Planning and Scheduling of Training

↓ Recruitment schedules have not been established to ensure sufficient plant maintenance staff (2)

↓ The number of staff scheduled to be trained in in-service inspection and pressure vessel inspections is not sufficient to meet the expected workload. (1)

↑ For specialized maintenance skills, such as non-destructive testing and in-service inspection, a suitably trained and equipped national team may overcome the problems with insufficient resources at individual units. (1)

↑ Team briefings are provided for plant personnel to update them on activities and changes taking place on the station. The briefings are conducted by senior staff to give credibility to the importance of the programme. (Hunterston-UK)

↑ The kick-off meeting before start of work is an excellent way to discuss and inform all involved personnel about important matters for performance of the work. (Fukushima Daini-Japan)

Design and Development of OJT Programmes

↓ On the job training is not supported by training materials, performance standards, or observation/evaluation checklists. A formal, structured on-the-job training programme should be developed. (9)

↓ Performance standards/objectives have not established for practical training (e.g., OJT, laboratory training, simulator training. (4)

↓ Lesson plans have not been developed specifying learning objectives, instructor and trainee activities, training methods, training equipment, and training material to be used. (2)

↓ Training requirements, including those for OJT, are not assembled into a concise document that defines the training programmes for each job/position. There is no list of minimum activities that are required to be demonstrated prior to qualificaiton. (5)

↑ The detailed use of an individual training plan, generated from the Plant Training Plan, the unit Training Plan Guide and the Departmental Standard Training Plan is a very structured and systematic method to ensure training needs of the plant are addressed. (Gravelines 3/4-France)

↑ Table top scenario-based training is provided for operations shifts in the diagnosis of plant equipment malfunctions to enhance integrated plant knowledge, team skills, and diagnostic capabilities (Kola, Russia)

↑ A three-month shadow training period is provided during which employees use a structured training pack and discuss risks associated with different plant locations and activities. (Cattenom, France)

Implementation of Training Programmes

↓ Not all courses include an assessment of trainee mastery of the objectives at the completion of the training (1)

↓ There is no, structured continuing training programme to provide personnel with refresher training on infrequently performed, difficult and important tasks, or on operating experience feedback, or revisions to plant equipment or procedures. (7)

↑ Practical training, including OJT is used to reinforce the safety culture attribute of maintaining a questioning attitude when performing a task, rather than completing it in a mechanical way. (Guandong, China)

Evaluation of Training Programmes

↓ There is no formal evaluation of OJT programmes (5)

↓ A system has not been established to ensure that training materials are updated to reflect plant modifications and procedure changes (3)

↓ There is no systematic process for the collection, review and response to feedback from trainees during training and after beginning work in their new positions, or from supervisors of trainees and graduates. (1)

↑ The system used in the Training Department to screen the operating experience information from internal and external sources is excellent. It secures the feedback of relevant parts of the information and includes it in the training programmes. (Grafenrheinfeld, Germany)

↑ Formal interviews are used at the beginning of each year to specify individual training needs and to identify needed improvements in training programmes (Fessenheim 1/2-France)

↑ After each training session, there is a formal evaluation of training with all individuals involved. This is followed by recommendations of changes to the training centre sub-working groups. Once a year these recommendations are analyzed and directed to the corporate level training division. (Blayais-France)

Verification of the Qualification of Contractors' Personnel

↑ Contractors staff requiring access to utility sites must have an access passbook which contains details of the individuals radiation exposure, and training in the areas of quality, safety, prevention of risk, and ALARA. Using the access passbook in this way, the utility is able to determine immediately if the contractor is qualified and hence the utility has an improved level of confidence in the contractor's ability to perform work on site. (Cattenom 1/4-France)

↑ The reception of contractors at the plant is performed in a way that ensures a high level of awareness of safety and quality. A handbook given to contractors provides them with important information for work on site. (Fessenheim 1/2-France)

Instructor Training and Qualification

↓ OJT instructor/evaluator training on instructional techniques and assessment techniques is not provided (2)

↓ In-plant personnel who design and develop training materials or conduct on-the-job training are not provided training on the skills and knowledge needed for these tasks. (1)

↓ No formal programme for continuing training of instructors is provided (4)

↓ Evaluation of instructor delivery of training is not performed (6)

↓ OJT trainers and evaluators should be identified for specific tasks (1)

INTERNATIONAL ATOMIC ENERGY AGENCY

OPERATIONAL SAFETY REVIEW TEAM (OSART) PROGRAMME

Description of the OSMIR Database

OSART mission results have been incorporated in a database OSMIR (per OSART MIssion Results). This database covers all missions since January 1991 and is currently operable. It is updated as the report of each mission is published and will eventually be maintained with results of the most recent five years' missions. The results of OSART follow-up visits are also included.

The information incorporated in OSMIR is the same as the results contained in the OSART mission reports, except for minor editing to identify abbreviations, replace specific by universal terms (when possible) depersonalize the information avoiding references to the NPPs, utilities, etc.

To date, the results of twenty-eight OSART missions and twelve OSART follow-up visits have been incorporated covering reviews carried out during 1991 to 1995. The information is filed according to:

- Mission identification (plant information, name, country, reactor type and size; dates of mission; type of mission; etc).

- Mission results (currently comprising 1532 recommendations, 1011 suggestions and 284 good practices) each of which is categorized by review area (15), topic (~160); together with a statement of the issues related to each recommendation and suggestion.

- Follow-up visit results giving information on remedial actions planned/carried out by NPPs and IAEA experts' comments and judgements of progress for all recommendations and suggestions covered by follow-up visits.

Examples of the type of searches that can be made of the database range from global searches, for example all findings related to a review area, e.g. training and qualification, to more specific searches, for example looking for recommendations of generic significance for a given topic at PWR plants that have been assessed during a follow-up visit as having been satisfactorily responded to.

The database is now available to NPPs, utilities, regulators and associated research institutes on two floppy disks in compressed (.zip) format together with decompression software. Alternatively, hard copy print-outs of results of requested searches can be provided. The database has been compiled using MS Access 2.0 and is currently 3.7 Mbytes in size with over 2,800 records. A technical description of the OSMIR database is available to assit users and would be included with each diskette copy of the database. Access tables can be exported to other databases, e.g. Paradox 3.X/4.X, FoxPro 2.0/2.5/2.6 and Dbase III/IV

The results are classified according to :

Search Key	Result
R	Recommendations
S	Suggestions
G	Good Practices

Results are contained in Review Areas and Topics following the criteria of the *OSART Guidelines*, IAEA-TECDOC-744). (see Attachment A), which permit the retrieval of selected results through pre-defined criteria. A result is therefore identified by the following keys e.g. (Guangdong NPP, Fire Protection Programme).

Mission No.	69
Review Area	3 (Operations)
Topic	8 (Fire Protection Programme
Type of result	(R, S, G)

OSMIR is composed of several tables, (see attachment B), the most important concerning search keys is "MISSIONS". This table contains all technical and administrative references described below:

Technical	Administrative
Plant (name)	Mission No.
Reactor type/size	Country
Plant status	Mission dates/year
Mission type	Report reference
Commercial operation	Report status

OSMIR contains all the results in memo fields. Each recommendation and suggestion is logged in two memo fields named Issue and Result. The Issue explains what the problem is while the Result recommends or suggests a specific action to solve the problem. Consequently to understand the concern in depth, both issues and results should be retrieved together. In some instances issues are not provided.

OSART Follow-up visit results are also included in OSMIR, although for various reasons not all OSART missions have Follow-up visits.

Part IV presents the OSMIR database printout of good practices and selected good performances by areas identified by OSART missions during 1993 and 1994. It is an example of the database and can be used by the power plants. For detailed information it is suggested to contact the power plants where good practices and performances have been noted. The addresses of the plants with good practices or selected good performances identified in the years 1993 and 1994 are in the attachment to Part IV.

Requests for further information, copies of OSMIR or printouts should be addressed to :

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DATABASE (OSMIR) TOPIC KEY LIST

1. MANAGEMENT, ORGANIZATION AND ADMINISTRATION

1. Corporate organization and management
2. Plant organization and management
3. Quality assurance programme
4. Regulatory and other statutory requirements
5. Industrial safety programme
6. Document and records management
7. Site access control (optional)

2. TRAINING AND QUALIFICATION

1. Organization and functions
2. Training facilities, equipment and material
3. Control room operators and shift supervisors
4. Field operators
5. Maintenance personnel
6. Technical support personnel
7. Radiation protection personnel
8. Chemistry personnel
9. Management and personnel
10. General employee training

3. OPERATIONS

1. Organization and functions
2. Operations facilities and operator aids
3. Operating rules and procedures
4. Operating history
5. Conduct of operations
6. Work authorizations
7. Accident management
8. Fire protection programme.

4. MAINTENANCE

1. Organization and functions
2. Maintenance facilities and equipment
3. Maintenance programmes
4. Procedures, records and histories
5. Conduct and control of maintenance work
6. Material conditions
7. In-service inspection
8. Stores and warehouses
9. Outage management

5. TECHNICAL SUPPORT

1. Organization and functions
2. Surveillance programme
3. Operational experience feedback system
4. Plant modification system
5. Reactor engineering
6. Fuel handling
7. Safety related computer applications

6. RADIATION PROTECTION

1. Organization and functions
2. Radiation work control
3. Internal radiation exposure
4. Radiation protection instrumentation, equipment and facilities
5. Personnel dosimetry
6. Radioactive waste storage and discharges
7. Radiation protection support during emergencies

7. CHEMISTRY

1. Organization and functions
2. Chemistry control in plant systems
3. Chemical surveillance programme
4. Chemistry operational history
5. Laboratories, equipment and instruments
6. Quality control of operational chemicals
7. Radiochemical measurements

8. EMERGENCY PLANNING AND PREPAREDNESS

1. Emergency organization and functions
2. Emergency plans
3. Emergency procedures
4. Emergency response facilities
5. Emergency equipment and resources
6. Training, drills and exercises
7. Liaison with public and media

9. COMMISSIONING

1. Organization and management of commissioning
2. Commissioning programme
3. Training in commissioning
4. Preparation and approval of test procedures
5. Control of test and measuring equipment
6. Conduct of tests and approval of test results
7. Maintenance during commissioning
8. Interface with operations

9. Interface with construction
10. Interface with engineering (designer)
11. Initial fuel loading
12. Plant handover
13. Work control and equipment isolation during commissioning
14. Control of temporary modifications

10. PROJECT MANAGEMENT

1. Corporate organization and management
2. Construction and operating organization - site responsibilities
3. Organization of main contractors
4. Organization of the regulatory body's responsibilities
5. Project objectives, planning, scheduling and monitoring
6. Methodology for maintaining consistency in project results
7. Design and construction engineering
8. Procurement: criteria and control
9. Control of changes
10. Industrial safety programme
11. Fire protection programme

11. CIVIL ENGINEERING AND CONSTRUCTION

1. Civil contractor organization
2. Quality control
3. Planning
4. Document control
5. Procurement and material control
6. Civil construction and installation
7. Material testing laboratory

12. MECHANICAL EQUIPMENT INSTALLATION

1. Mechanical contractor organization
2. Quality control
3. Planning
4. Document control
5. Procurement and material control
6. Mechanical construction and installation
7. Testing and preparation for turnover

13. ELECTRICAL AND I&C EQUIPMENT INSTALLATION

1. Electrical and I&C contractor organization
2. Quality control
3. Planning
4. Documents control
5. Procurement and material control
6. Construction and installation
7. Testing and preparation for turnover

14. QUALITY ASSURANCE IN CONSTRUCTION AND COMMISSIONING

1. Corporate QA programme
2. QA programmes of the NPP project Organization
3. QA programmes of contractors
4. QA during commissioning and startup
5. QA programme for the operational phase
6. Document control
7. Non-conformance control and corrective actions
8. Records
9. Audits
10. Procurement control

15. PREPARATIONS FOR STARTUP AND OPERATION

1. Management, organization and administration
2. Training and qualification
3. Operations
4. Maintenance
5. Technical support
6. Radiation protection
7. Chemistry
8. Emergency planning and preparedness
9. Commissioning

DATABASE (OSMIR) - ACCESS - FILE STRUCTURE

DATABASES

1. MISSIONS (MISSIONS)

1. Mission No	MISSION_No	L1	Num	Integer
2. Mission Type	MISS_TYPE	L8	Text	1
	O:Operational			
	P:Pre-Operational			
	T:Technical Exchange Visits			
	S:Safety Review Missions			
3. Country	COUNTRY		Text	15
4. Plant	PLANT		Text	20
5. Reactor Type/Size	R_TYP_SIZE		Text	15
6. Plant Status	PLANT_STAT	L9	Text	1
	C:Construction			
	K:Commissioning			
	O:Operation			
7. Commercial Operation (yr)	COMME_OPER		Date/Time	Medium Date
8. Plant Standards	PLANT_STAN		Text	1
	N:Normal			
	U:Upgrading Process			
9. Dates	DATES		Date/time	Medium Date
10. Year	YEAR		Num	Integer
11. Report Reference	REP_REF		Text	22
12. Report Status	REP_STATUS		Text	1
	A:Being written			
	C:Sent out for comments			
	R:Finalized and Sent out (Restricted for 90 days)			
	D:Derestricted			
13. Report Status date	STAT_DATE		Date/Time	Medium Date
14. Team Leader(Name)	TEAM_LEAD		Text	15
15. IAEA Staff (N°of)	IAEA_STAFF		Num	Integer
16. External Exp (No)	EXT_EXPERT		Num	Integer
17. Scient.Visit (No)	SCI_VISITR		Num	Integer

2. FOLLOW-UP VISITS (FUP_VIST)

1. Follow-up Vis. (No)	FUP_VIS_NO	L2	Num	Integer
2. Mission No.	MISSION_NO.	L1	Num	Integer
3. Dates	DATES		Text	20
4. Year	YEAR		Num	Integer
5. Report Reference	REP_REF		Text	22
6. Report Status	REP_STATUS		Text	1
7. Status Date	STAT_DATE		Date	8
8. Team Leader (Name)	TEAM_LEAD		Text	15
9. IAEA Staff (N°of)	IAEA_STAFF		Num	Integer
10. External Exp (No.)	EXT_EXPERT		Num	Integer
11. Scient. Visit (No.)	SCI_VISITR		Num	Integer

3. MISSION RESULTS (MISSREST)

1. Mission No.	MISSION_NO	L1	Num	Byte
2. Review Area	REV_AREA	L3	Text	3
3. Topic Reference	TOPIC_REF	L4	Num	Byte
4. Ref. to Topic (in report)	REF_TOPIC	L5	Text	11
5. Key for Selection	SELECKEY		Text	1
6. Result type	RES_TYPE	L6	Text	1
	R: Recommendation			
	S: Suggestion			
	G: Good Practice			
7. Issue	ISSUE		Memo	
8. Result	RESULT		Memo	

4. FOLLOW-UP VISIT RESULTS (FOUPREST)

1. Mission No	MISSION NO	L1	Num	Integer
2. Follow-up Visit No	FUP_VIS_NO	L2	Num	Integer
3. Ref. to Topic (in report)	REF_TOPIC	L5	Text	11
4. Follow-up Visit Result Status	FUP_STATUS	L7	Text	1
	1:Issue resolved			
	2:Satisfactory progress to date			
	3:Little or no progress			
	4:Withdrawn			
5. Plant Response	PLANT_RESP		Memo	
6. IAEA Comments	IAEA_COMME		Memo	

5. REVIEW AREA (REVIEWAR)

1. Review Area	REV_AREA	L3	Text	3
2. Review Area Description	RA_DESCRIP		Text	50

6. TOPIC (TOPIC)

1. Topic Reference	TOPIC_REF	L4	Num	single
2. Topic Description	TOP_DESCRI		Text	80
3. Review Area	REV_AREA	L3	Text	3

7. RESULT TYPE (RESULTTY)

1. Result Type	RES_TYPE	L6	Text	1
2. Result Description	RES_DESCR		Text	20

8. FOLLOW-UP VISIT RESULT STATUS (FURESTAT)

1. Follow-up Visit Status	FUP_STATUS	L7	Text	1
2. Status Description	FU_ST_DESC		Text	30

9. MISSION TYPE (MISSTYPE)

1. Mission Type	MISS_TYPE	L8	Text	1
2. Mission Type Description	MI_TYP_DESC		Text	30

10. PLANT STATUS (PLANSTAT)

1. Plant Status	PLANT_STAT	L9	Text	1
2. Plant Status Description	PLA_STA_DES		Text	15