OSART Good Practices
MANAGEMENT, ORGANIZATION AND ADMINISTRATION
Organization and administration

Kashiwazaki 3/6, Japan
Mission Date; 1-18 Nov., 2004

The removal of work in order to save valuable time for developmental initiatives was stimulated by an excessive work load and ever increasing overtime during recovery from the disclosure scandal and the subsequent increased regulation and external scrutiny. The approach used has been to initiate a "work scrap" process with the mandate to remove unnecessary work and save time for improvement projects. The difference with the approach used by Kashiwazaki-Kariwa NPP is the wide mandate and the high level of sponsorship and commitment. The implementation team, which has a formal mandate and process with essential criteria, meets once per week and is sponsored by the Site Superintendent and chaired by the Deputy Superintendent Quality assurance and Nuclear safety. It contains high level representation from all areas of the site. In the first four months of operation 84 ideas have been received and 23 enacted. As an example the meeting process and structure was examined. It was found that there were 35 meeting per month for managers above group level. Of those 6 have been eliminated and 9 shortened saving a total of 5600 manager hours per year. The OSART team also observed that the efficiency of some meetings could be improved and that there may be opportunities to combine some. The site management is encouraged to continue to reduce meeting time. As well as "meetings" the Work-Scrap team has identified many other areas such as inefficient organisational aspects, which are only in existence because "that was always the way it has been done" or where a small team approach can save considerable time over the normal process. With the high level sponsorship necessary changes are quickly enacted. An added side benefit is that the managers are working together in a cross function mode, out of their normal silos and creating group successes.

Kashiwazaki 3/6, Japan
Mission Date; 1-18 Nov., 2004

The process of plant improvements is well organized and displayed to the plant personnel and contractors. The plant has established a process in which anyone can suggest findings on the site for improvements. Proposals are regularly evaluated and in reasonable cases timely implemented. The bulletin boards at the entrances to the plant units are used to display results of the evaluation or implementation of the improvements. These boards further promote the improvement process and encourage personnel to participate.
Competence Mapping System as a tool to solve the retiring personnel issue and future staffing needs.
The national and local programme of replacement of retiring personnel ensures availability of knowledge with the long-term view (up to 2022), by defining the recruitment and training programme.
The significant number of staff reaching retirement over the coming years is being addressed proactively through the setting up of a skills renewal programme. This project is coordinated by corporate management from the Nuclear Operations Division of EDF.
To illustrate the problem, half of the plant personnel will be taking retirement over the next 10 years. The strengths of this programme are:
1. An overview of crafts and how they are changing encompasses the strategic view of corporate management and the experience of plant management.
2. The programme for forecasting succession management structured at three levels – corporate, plant and craft – with coordination between them. This initiative enables the flow of personnel to be proactively forecasted (recruitment, reallocation, etc.) as a way of covering for future retirement.
3. Skills mapping for each craft at plant level:
   · To visualise available skills and any changes over time
   · To decide on actions to be taken in the area of skills and resource management (training courses, shadow training, induction of newcomers)
4. Through developing complementary action plans for addressing transfer of knowledge, based around four points:
   · Integrating newcomers
   · Craft-specific initial training
   · Shadow training in the workplace
   · Know-how that is the key to performance
The programme is based on every single area of competence, how and when the change has to be organized. The date of change is estimated for every position. Lost skills and knowledge is identified. New requirements are defined assuming other factors such as development in area of safety, management improvement, company internal sources and sensitiveness of skills. Based on previous steps the recruitment and training programme is defined.
Relationship between plant, public relations departments and media.

Public Relations (PR) of SUNPP works in cooperation with public relations departments of Ukrainian NPPs and region mass media. PR department systematically takes part in workshops and other activities devoted to nuclear power engineering. PR department also provides experience exchange related to PR activities. It also uses advanced technology as nonlinear editing for TV-programmes and computer makeup. PR department provides subject-matter video and radio-programmes, newspaper releases of SUNPP performance. PR cooperates to broadcasting local and regional channels, FM-broadcasting and regional newspapers releasing. PR department provides excursions of the SUNPP and pumped-storage plant for pupils, representatives of other enterprises of the satellite-city as well as for regional settlements. PR department arranges annual competitions such as brain-rings and exhibitions for pupils aimed to be acquainted with power engineering.

Examples of regular projects of public relations department:

- "Energetic" newspaper - once a week
- TV programme- once a week
- Radio programme- 3 times a week
- Special Informational programme- 2-3 times a week
- Press-fact release- once a week

Results: Workers, community or any person interested can obtain complete information about SUNPP performance and be convinced of its reliability and safety. Additionally, on a regular basis the SUNPP staff and local residents are informed via local mass media about the results of implementation of ALARA principle and of activities to minimize the quantity of liquid and solid radioactive waste at SUNPP.

Note: The OSART team leader was invited to present OSART methodology and OSART objectives to a meeting where all mayors of the SUNPP Region (about 30) were present. This meeting was followed by a press release. In the same way a video was taped during the press conference, which was organized at the end of the mission to inform the public on the progress of the OSART mission.
Permanent safety upgrades to reduce overall plant risk.

The FORTUM Corporation has demonstrated a long term commitment to ongoing investment in equipment and system upgrades that have significantly reduced overall plant risk for core damage and release of radioactivity.

Several extensive modifications were completed to improve availability of the ultimate heat sink following internal and external events, including:
- Improved design and added additional redundancy for the residual heat removal system, including electrical separation.
- Providing redundant cooling water supply to emergency diesel generators.

Several extensive modifications have been completed to reduce the likelihood of radioactive release post-accident including:
- Addition of automatic isolation of primary coolant purification system when pressurizer pressure decreases.
- Relocation of the reactor coolant pump emergency seal water suction line.
- Addition of automatic isolation of reactor coolant pump seal water heat exchangers based on high pressure.

Public information is exceptionally well developed.

The public relations department arranges its activities at a very high level for the following areas:
- Daily information is provided on the NPP web site www.xaec.org.ua regarding safe operation of the units, radiation monitoring level, environment and all events at the plant. Web-site material is presented in Ukrainian, Russian and brief version in English.
- Public relations department constantly informs NPP staff and the public of the satellite-town (Neteshin) and the whole region using the following means:
  o Newspaper "Perspectiva" (issued once a week, free distribution);
  o TV-programme (transmitted once a week to Slavuta, Shepetovka, Izyaslav);
  o NPP internal information TV (e.g. the current plant and safety performance, operational experience, planned activities for further safety improvements);
  o Radio broadcasting (twice a week); and
  o Live broadcasting with plant key specialists.
- Scheduled public interviews with NPP managers of all levels - 16 groups, 861 people;
- Regular meetings between KhNPP specialists and the public;
- Excursions for pupils, students, public organizations;
- Job-orientation activities for students of the satellite-town and nearby settlements.

Personnel and the public can receive complete and on-line information about the KhNPP operation, to understand its safety and reliability. Organized public relations activities are popular among the public and promote a good image of the KhNPP.
Structuring the management manual in such a way that the requirements for each unit are described in one chapter of the management manual. Responses by the units on how they will meet these requirements are described in an adjacent chapter. This structure aids in communicating expectations and commitments to the plant staff.

It is important to safety for the organization to be committed to the requirements. Thereby, the personal engagement can be improved supporting fulfilment of the expectations.

The plant has structured the management manual into four main chapters:
1. Management principles
   a. Company structure
   b. Vision and company mission
   c. Management philosophy
   d. Policies
   e. Management expectations
2. Organization
   a. Responsibilities
   b. Definitions of management levels
   c. Safety management principles
   d. Delegation
   e. Authorities
   f. Organization charts
3. Quality requirements
4. Replies from the individual units on how they meet the quality requirements.

In chapter 4, all eleven organizational units give their replies on how they meet the quality requirements stipulated in chapter 3. The replies are given on a free format, where applicable instructions, procedures, etc., are referenced in order to facilitate more detailed information when required.

Each reply must respond to all requirements placed on the organizational unit and the reply is used in internal audits to ensure that all responsibilities are taken care of. Internal audits are performed to ensure field observations are consistent with the commitments made.

Overall personal commitment to the requirements set up by the company is significantly improved by this structured approach.
Balakovo 4, Russia

Permanent public answering machine (hot line) on the plant current status. There are several ways how the plant information center informs the public in case of an operational event in the plant. The press release on the event is distributed to about 20 press agencies and newspapers. The information about the plant event is published on the corporate and the plant web pages. Following press articles and web information are monitored to provide timely and focused feedback. The plant information center also operates an answering machine permanently available to the public. In case of an operational event in the plant, the information on the answering machine is updated within few hours, 24 hours round, including days off. Using a permanent public answering machine with prompt information on the plant safety status is considered as a good element of transparency.

Example of the hot line information about an abnormal event:
"...on 8 April 2008, 13:32, there was a power reduction and disconnection from national grid of the Balakovo NPP unit 4 caused by a problem at the external electrical transmission line. The reactor unit was stabilized at 40% of nominal power. Power output of the units 2 and 3 was reduced to 700 MWe on request of the national grid dispatcher.

Level of radiation in the town of Balakovo and in the vicinity of the plant is without changes. Eight (8) to 15 microroentgen per hour, is the level of natural background activity in the European part of Russia. .."
The effective use of Performance Indicators to provide a foundation for driving continuous improvement

The plant staff utilizes performance indicators to effectively influence plant performance. The indicators are prevalent at all levels of the organization with lower tier indicators feeding forward to the broader scope indicators. The management team monitors the indicators and drives performance based on the goals reflected by the indicators. Goals are established which represent excellence in the industry. The monitoring of the indicators is woven into the daily plant status meetings to facilitate a high level of engagement in performance. The indicators are also used as key input elements in decisions. The administrative aspects of populating the indicators are integrated into the tasks to minimize the burden.

There are a variety of examples where the indicators have been used to improve performance. In the Radiological Protection area, dose and contamination performance has been sharply improved by broadly communicating the overall goals and then establishing short and intermediate targets for organizational focus. For example, success in meeting the annual dose goal is built upon meeting daily and weekly goals throughout the year. Dose performance is reviewed daily in management and working level meetings. Progress curves are utilized to monitor outage preparation and execution. These curves are reviewed frequently and are utilized to coordinate resources, identify problem areas and motivate the staff. The focus on goals associated with INPO(The Institute of Nuclear Power Operations) index, forced loss rate, and unit capability factor have also resulted in significant improvements in these areas.

The plant’s high level indicators are reviewed by the corporate office and peers from other plants on a six week basis as part of Management Review Meetings. This provides an opportunity to examine performance, challenge goals and exchange ideas for improvements. The higher tier performance indicators reviewed at this level are reflective of the lower tier indicators and performance. This structure helps establish vertical alignment of the organization giving the plant staff common goals.

The indicators are both leading and lagging meaning they are used to establish performance goals for the future and measure past performance. The leading indicators are commonly indicators that measure preparation or monitoring of activities. The lagging indicators commonly measure actual production or accomplishments.

The benefit gained from this approach is a collective focus of the staff on the correct performance elements for the plant. The performance indicators are a leadership tool, a management tool, a communication tool, an education tool and a means of motivation. The engrained nature of the use of performance indicators provides a foundation for driving continuous improvement.
Planning of staffing needs, cooperation with external educational institutions, and succession training for manager positions

A five yearly and an annual planning procedure for staffing needs is implemented at Rivne NPP. The planning is performed on the basis of the analysis of the human resources flow, which includes the following:
- Analysis of retiring personnel of all categories,
- Analysis of voluntary terminations of working contracts by employees,
- Study of promotions including transfer to other parts of the organization.

On the basis of scheduled needs, the sources of human resources are specified. Usually they are the state employment services, external hiring processes, vocational schools of Rivne NPP and high educational institutions.

In order to satisfy the needs of staffing and work with personnel, a system of cooperation with educational institutions of different levels (universities, technical schools, vocational schools, training centres of other Ukrainian nuclear power plants) is implemented at Rivne NPP and in the operating organization. Cooperation with educational institutions is aimed at addressing the following issues:
- Selection candidates for future employment at Rivne NPP (professional orientation)
- Preliminary preparation of NPP working personnel and managers in order to provide them professional training
- Creation and maintaining the plant training base on the necessary level
- Advanced full time training of the personnel
- Improvement of the plant personnel of their general and professional education and knowledge

In addition, the cooperation with educational institutions has the following benefits:
- Work in the area of professional orientation for young population of the region in order to form a positive image of the power plant and encourage people to learn the professions necessary for the nuclear power plants.
- Support of the student development process.
- Provision of opportunities for internships.
- Ensuring future employment for students who have decided to work at the power plant.

The positions of managers of all levels are supported by the availability of well structured and trained staff reserve of all the management chains. A high level of effectiveness of manager staff reserve should be noted. The policy of planning for career promotion of these personnel ensures sufficient number of qualified and experienced personnel and the necessary inflow of young trained personnel. Creation and management of the management staff reserve is performed at all the levels of the Rivne NPP structure taking into account the following basic principles: dialogue, publicity, mobility, detection of potential, joint leadership, delegating of authorities. The process of generation and management of the management staff reserve in accordance with the above mentioned principles ensures the following:
- Organizational system of Rivne NPP management training on the basis of principle of management competencies development
- Development of management incentive and motivation in the staff reserve development
- Creation of a new generation of managers, capable of transferring to the modern type of NPP management based on the principles of strategic management and the involvement of managers of different levels in the organization management.
The organization of the commissioning interface between DNMC and CNPEC is well established.

The commissioning interface is clearly documented, responsibilities are clearly determined, regular coordination meetings are held, goals and objectives are consistent among both Company’s line managers, experienced staff are assigned to CNPEC. The organization is very well supported by shared Information and Management System that allows both Companies to thoroughly monitor the commissioning. Examples of systems put in place are:
- Process to take over systems is well described in clear procedures: take over for blocking, take over for maintenance, take over for temporary operations, Building Hand Over. At each stage level 1 criteria are defined which are to be fully complied with for take over. A leading DNMC department has been designated for the different stages.
- A computer data base is shared with CNPEC, Take over Information and Management System, which allows both organizations to follow-up pending issues related to take over process, to have statistics and retrieve all documents related to the system take over.
- A unique schedule of DNMC and CNPEC activities is issued regularly and reviewed by the operations preparation department. This schedule includes all activities, including take over for blocking, for temporary operations, etc. It allows management to address potential resource conflicts with the needs of operating units.
- Instrumentation and Control maintenance engineers were involved in the review and test acceptance of a new design, the Distributed Control System, at the beginning of the process.
- DNMC personnel have a defined schedule of participation in the start-up of systems and plant in order to get the technical knowledge needed during operations. A schedule to verify the consistency and accuracy of the plant procedures is in place to take opportunity of the different stages of the commissioning.
- The monthly monitoring report on readiness for operations reviewed by the management gives comprehensive performance indicators on quality and readiness during commissioning.
- A comprehensive review of all contracts to check the comprehensiveness of spare parts needed for the two first years of operations has been performed by DNMC. Spare parts are procured by CNPEC. A data base "Equipment Integrated Preparation System" is shared by both companies to monitor and check the full process.
- Responsibility is clearly defined between construction and operations. The responsibility of chairing the commissioning committee is taken by the plant manager from the first fuel loading.
- In order to handle the main milestones, a dedicated focus team has been set up, lead by senior managers (cold functional test, hot functional test, first fuel load, take over, environment and emergency, etc.).

To set up such a well linked organization between DNMC and CNPEC will strengthen co-operation and capability to address any issue during the take over of the plant.
In 2004, the plant established a programme to have Senior Reactor Licensed Engineers in departments other than the operations department. This programme supports the safe operation of the plant and improves the plant knowledge of line managers and engineers. Currently there are nine licensed engineers in the following departments:
- two in system and reactor performance department;
- two in work control division;
- four in maintenance superintendence; and
- one in support engineering superintendence.
These engineers support their departments with the license training knowledge and assist in the decision making process with regard to the safe operation of the plant.

Risk ranked activities evaluations are used to monitor contractors in the field. The Nuclear Project Group is responsible for many of the capital improvement projects undertaken at plant and it relies heavily on contracted work forces to implement these projects. As a result, an important focus area for staying in the preventive mode is contractor control. Nuclear Project Group uses many tools to achieve an effective contractor control program. One of the more comprehensive tools is a detailed Contractor Field Activity Monitoring Plan (FAMP).
The Nuclear Project Group develops the FAMP to ensure contractors’ activities are performed safely and completed with first time quality. Focus areas of the FAMP include the contractor’s organization, supervisor to worker ratios, training/qualifications and work package preparation. The plan uses a graded approach for identifying where focused monitoring and oversight will be performed. The contractor’s field activities are evaluated and risk ranked. The risk ranking considers both industrial safety and equipment/nuclear safety. Activities identified as high risk are flagged in the outage schedule as a High Risk FAMP Hold Points.
The use of FAMP has become an important and effective tool to strive for improvement in the area of contractor control. The plant has been using FAMP the last 5 years. The plant has had several plants come and benchmark the process and have FAMP as one of their transferable good practices.
The efficiency of the Nuclear Project Group’s control is evidenced by:
- Back to back breaker to breaker runs for the last two operation cycles with no challenges due to contractor performance in the field; and
- Contractor performance during the last refuelling outage where there was one first aid, no Occupational Health and Safety recordable injuries.
Koeberg has developed an educational board game to enhance the understanding of the business cycle with the essential focus on safety and to improve the alignment around top level Koeberg goals, by using it in the Management and Leadership development program.

The object of the game is to accumulate the highest number of Key Performance Indicators (KPI) points whilst staying solvent. The key role of safety is built into the set of KPIs. The KPI washers are weighed at the end of the game to determine the winner.

There are 4 pairs of players and one banker at a table. Each team has a token item (representing a power station) which is driven clockwise around the board with the next landing point governed by the results of a double dice throw. Players take turns. A team falls out of the game if it is unable to pay any debt incurred, more than one KPI reaches zero, or the team cheats.

Each team has a KPI Rack filled with 30 KPI washers to bring it to target level at the start of the game. The higher the number of KPI washers, the better.

Each team starts with a fixed amount of money.

Each Initiative Card represents an action which is in support of a Station Goal as indicated in the centre of the board. When a player lands on an Initiative Card and it is not purchased, he may purchase it and then enjoy the KPI points benefits indicated should he again land on the block in future. If he lands on an Initiative block already owned, then he pays the penalty number of KPI points indicated to the bank. Any time he lands on an initiative block that he already owns, apart from collecting the KPI benefits from the bank, he may elect to increase the benefits and penalties of that block by paying the indicated doubling or tripling fee to the bank. Once a team owns an initiative block then he should put one of his buttons on the block. If the owner has pushed its penalties and benefits to double or triple then a corresponding number of buttons should be put on the block.

Event cards: On landing on an Event block (event are drawn from actual records), the team must carry out the instructions indicated on the card on the top of the pack (placing the old card at the bottom).
Angra 1, Brazil

The plant requires all Managers to obtain and retain at least Cold (Inactive) Licenses as a Shift Supervisor, which means that they undergo the entire training and evaluation (including psychological and medical) as a Shift Supervisor, including Simulator Training and routine re-training. The only difference from a Hot (Active) License is the requirement to perform a minimum number of shifts every year, which can be easily met if required. This practice was started several years ago, to combat the shortage of licensed Shift Supervisors, as one of the measures to increase the attractiveness of this specialized career (Operations) involving the arduous task of obtaining the License, the difficulties of working in shifts, and the tension of this highly responsible position. That difficult phase is now long past, but this practice still provides the following significant benefits:

- An ample supply of Shift Supervisors is assured.
- All members of the plant management are well aware of the whole plant, its safety features and requirements, the exigencies of plant operation and the priorities in emergency situations.
- The top management of the plant, coming from this pool, also enjoy this strong background.
The Exelon Nuclear Management Model (NMM), coupled with strong inter-site and corporate support allows credible cross-site comparisons to be drawn and leverages the efficient use of company resources. Station personnel are widely familiar with the NMM and the expectations for its use. The model integrates all the elements of management of the Exelon nuclear fleet so that processes and activities that may affect safety are established and conducted coherently with other requirements. Implementing the model ensures that safety is not compromised by other requirements or demands and accords with IAEA SSR 2/2 Section 3: The management and organizational structure of the operating organization.

The structure and purpose of the NMM and its documented structure is clear. It facilitates consistent application of company standards and procedures across a large, technically diverse fleet. When new stations enter the Exelon fleet a gap analysis is performed between the NMM and the incoming plant’s arrangements. The model is updated where improvements are seen and a reasonable period of time is given for the new plant to transition to the model.

Similarly, if a gap is identified through processes such as self-assessments and INPO evaluations, peer groups consider the issue and whether the model should be updated. Proposed revisions are piloted at a small number of sites prior to introduction across the fleet if the pilot is successful. This promotes engagement of the peer groups and their associated working groups.

New hires in certain supervisory or ‘singleton-expert’ roles are assigned mentors from other parts of the fleet or the corporate organization. This accelerates their development and promotes use of fleet best practice.

Corporate Functional Area Managers (CFAMs) are drawn from senior levels within the organization. The knowledge, experience and authority they possess gives added credibility to the use of the NMM and encourages inter-station co-operation and use of corporate support.

Some of the notable standardizations and benefits noted by the team are:
• Operating experience: the CFAM co-ordinates the company response for all level 1 and 2 INPO Event reports (IERs), distributing the required actions to the fleet, monitoring the response and ensuring consistency.

• Training: the corporate organization has provided a centralized training centre used for much of the initial training and certain specialized training such as welding. The corporate organization has oversight of the training procedures.

• Emergency Planning and Preparedness: corporate personnel are involved in the provision of facilities, equipment and procedures for the fleet. They have deployed standard criteria for the evaluation of drills and exercises which facilitates support from site to site, fleet comparisons of performance and dissemination of lessons learned.

• Nuclear Oversight: audits and assessments are coordinated across the fleet and conducted using peers from stations, other nuclear utilities and the corporate organization. The results are used to implement fleet-wide solutions in a resource-efficient manner.
• Severe Accident Mitigation: a unified approach to, and means of mitigating, severe accidents.

Examples were also seen in other review areas such as Operations, Radiation Protection, Technical Support and Maintenance.

Kola, Russia

Mission Date; 11-28 Nov., 2014

Induction and development of young professional recruits by undertaking a comprehensive work oriented project as a part of their individual development programme.

Each young professional is assigned to a mentor who has valuable expertise in his/her working area. During the first day following recruitment, the young professional prepares an individual development programme in collaboration with his/her mentor. This individual development programme is made up of a number of elements, including developing a project with the purpose of proposing a solution to a specific work related task.

The objectives of the project are to:
• reveal, support and develop the engineering potential of young professionals;
• deepen their knowledge of the plant and its equipment;
• establish contacts with colleagues and experts from other departments.

The time allowed for the fulfilment of this task is one and a half years. The task is chosen by considering the work area (specialism) of the young professional.

The best projects will be evaluated for implementation at the plant. They are also considered for scientific reports from the Kola NPP, as part of the plant’s participation in industrial and international competitions or conferences, for example - Youth: safety, science, business.

The examples of projects are:
• Modernisation of the plant drainage system and the turbine condensate return.
• Oil cooling scheme modifications for turbine oil systems 1-4.
• Creation of an object oriented data base for buildings and rooms at the Kola NPP, with the possibility of 3D modelling.
• Development of a process sheet for the radiographic inspection of elements of V-230 reactor covers.

The development of the projects enables the plant to:
• reveal the engineering potential of young professionals;
• have a fresh look at solving some urgent problems;
• focus the attention of young professionals on the importance and priority of safety, during the fulfilment of their task.