

# OSART Good Practices

## MANAGEMENT, ORGANIZATION AND ADMINISTRATION

### Management Activities

#### Penly, France

Mission Date; 29 Nov.-16 Dec., 2004

Management presence in the field as a site management method. Significant presence in the field is set as a policy of plant management with high priority.

Implementation of this policy is well documented and communicated to the plant managers on all levels and to the entire plant staff.

Management of the site is based on strong presence in the field, which has improved the plant's results significantly.

Management presence in the field is an overall initiative with formal specification, extending over time, whose goals are shared by different management levels. It has been a progressive approach and it has reached the different levels of management, right down to the work groups.

As part of this initiative, each manager carries out field tours on which a report is written up (1,000 field tours have been carried out in 2004).

The aims of field tours are to:

- encourage staff and encourage positive behaviour and good ideas
- correct any deficiencies found in the field, remind staff of plant rules and standards
- note any organisational or logistic difficulties which hamper the proper performance of activities and note the skills to be improved

Each department management holds specific meetings to examine the findings of the different managers, the deficiencies are prioritised, dealt with and classified according to organisational lines of defence.

This classification gives each department management and the site an overview of the site's strengths and weaknesses, the management's findings are compared with the causes of significant events as well as with the Regulator's findings. Analysis of these lines of defence enables the management presence in the field programme to be readjusted to focus on identified weaknesses.

Training sessions for all staff members have been carried out, bringing together the site's different work groups.

All the site's management has received special training in the management of lines of defence, using the Paks fuel incident as an example.

The human factors committee is made up of representatives of departments from the whole site. It analyses the lines of defence found to be the weakest to better describe them and share good ideas and good practices between departments and make them more robust.

The initiative has been under way for three years and results are improving in all areas: nuclear safety, industrial safety (fewer significant incidents, no automatic reactor scrams for 2 years, fewer significant events, successful outages).

An opinion poll conducted by the management of the corporate nuclear operations division shows that the satisfaction level of the site's staff is above the average for the sites.

## Blayais, France

Mission Date; 2-19 May, 2005

Use of decision-making sheets in case of complicated questions concerning nuclear safety, radiation protection, plant availability and environmental protection.

Any important decision to be made in regards with nuclear safety, radiation protection, electricity generation or environmental protection area is formalized and approved by the operations or maintenance Manager or on-call Manager.

The traceability of the decision made includes the following items:

the definition of the problem and the decision to be made;

the persons involved in the decision making;

the possible solutions or scenarios to be considered and the related analysis/justifications;

the final decision made;

the internal and external communication to be made on the decision made.

As for examples, important decisions include the following:

decision to shutdown the unit or to maintain the unit in operation in case of technical problem;

decision to extend the outage duration for specific problems;

decision to change the reactor operating mode;

decision to reduce the power.

The decision to be made is raised by the shift supervisor or the outage project manager towards the related manager (Associate Directors or on-call Manager) and the basis for the decision making is prepared with the support of the necessary expertise (maintenance, engineering, safety engineers, RP, etc).

## Brunswick, USA

Mission Date; 9-26 May, 2005

### Site Teamwork

Management efforts have been effective in fostering a culture that promotes good teamwork, focuses the staff on the operational needs of the station, and fosters a healthy work environment. All levels of the organization have a low tolerance for behaviors that do not support team efforts.

A group of about 40 managers, superintendents, and supervisors participates in biannual team building exercises. Significant management time and company resources are invested to help build teamwork and enhance relations with the local community.

An operational focus list is used to track and resolve current issues that challenge operational needs of the station. Each item on the list has an assigned owner of accountability and an associated action plan. A large number of senior reactor operators throughout the organization facilitate the use of this tool.

Multi-organizational teams are utilized to perform project level work such as the development of a refuel team, comprised of mechanics, operators, I&C technicians, HP's and engineering. This concept is used in other multi-organizational teams. High Impact Teams (HIT) are utilized for the development of complicated and critical projects to be performed during a refuel outage. These HIT teams are comprised of O&S, maintenance, operations, engineering and HP personnel to ensure that all competencies are represented.

The Brunswick NP team utilizes multiple communication actions to ensure all personnel are informed and current on critical plant and company activities. These include general communications efforts to provide "big picture" information to employees and specific up to the minute technical information.

Information is communicated through:

- Daily (Monday- Friday) e-mail of "Brunswick News"
- Periodic e-mail management updates via "Straight Talk"
- Daily Outage Newsletter
- Daily (Monday- Friday) OSART Newsletter
- Monthly site management meetings attended by all supervisors and managers
- Twice weekly site leadership meetings (Monday and Thursday @ 0800)
- Daily (Monday - Friday) Plan of the Day meetings @ 0730
- Weekly Site Vice President Lunch meeting with employees
- Quarterly Senior Management Compliments and Concerns meetings
- Weekly cycle training management luncheons

-Bi-Annual "all-hands" employee meetings attended by all available people at the site  
Current technical information is provided to a wide circle of plant staff through various computer systems. Plant personnel have easy direct access to this information. A few examples of this type of information are:

- Daily operator and turnover logs from the operating shift
- The work control system is on-line and workers can view the files on a read only basis. This allows people quick access to the latest on-line maintenance schedules and resource profile maps for system outages, as well as information on equipment out of service, scheduled system runs as well as system outage windows. It also includes restrictions placed on equipment such as limits on modifications or HVAC work. These profiles are updated automatically as adjustments are made.
- Site drawings, training records, licensing documents and other quality assurance documents are readily available over the computer.
- The BNP emergency preparedness (EP) internal web-site presents information in a format that is easy to read. It is current in a timely manner by the EP Staff and it contains links to these EP related documents that can be easily accessed by all employees for review:

As a result of the extensive communications outreach, employees are well informed on relevant issues, knowledgeable about important technical aspects of their jobs and quickly alerted when they need to respond. This results in increased ownership and pride in work performed well.

The plant practices risk-informed decision making within the licensing conditions is implemented for many purposes. The plant makes efforts expanding this to all sensible applications for the full scope level 3 living PSA in line with the plant policy to optimise production in the environment where nuclear safety has the overriding priority.

Ever since the plant developed its first Probabilistic Safety Assessment (PSA) it has been used to support safety related decisions. The plant has over 20 years of experience with probabilistic evaluations of design improvements. In 1984 a PSA analysis was performed to evaluate different design options for secondary pressure relief. In 1987 a study was started to investigate the reliability of the electrical bus bars.

Since then the plant has added PSA insights as additional input in its safety related decisions more and more. Examples of applications are:

- Pilot studies have been performed to optimize the Technical Specifications.

- A pilot study on “Lower End States” has been performed. Useful lower end states have been defined, e.g. a Trip Monitor and a Critical Safety Functions Monitor.

- This year (2005) a pilot study has been undertaken to investigate the use of the PSA in precursor analyses, both as a selection tool and to provide additional insights in an event evaluation process.

- Borssele’s PSA data have been used to support decision making with respect to source term forecast in (severe) accident situations. The programme (SPRINT) now shows the probabilities of the possible source terms.

The plant has experienced benefits both in safety increase and in cost reduction by using PSA and its applications in the decision making processes. Examples are:

- Reduction of workload in the refuelling outages while at the same time reducing the risk profile, both for the outage and for the complete fuel cycle.

- The PSA has been used in the design phase of the 1st Periodic Safety Review (PSR), where in several occasions the optimal design could only be selected by using PSA insights.

- The plant calculates the risk has actually occurred over the time by a living PSA tool, the “Risk Monitor”. Due to the planned and unplanned unavailabilities the risk increases and its significance depends on the absolute risk increase and the time of the unavailability. The plant has set yearly targets for risk increase due to planned and overall (planned and unplanned) unavailabilities. These risk increments are evaluated and analysed periodically (monthly and yearly) and corrective actions are initiated. The objective for planned unavailability has been set to 2 % of the Total Core Damage Frequency (TCDF). The target for the overall unavailability has been set to 5 % for 2000 with a decrease of 0,1 %/year to 2008. The yearly actual TCDF are 8,1%; 1,99%; 2,93%; 4,15% and 2,55% from 2000 to 2004 respectively.

The PSA and its applications support performance evaluation and identify possibilities for further developments. The results show that, while surveillance and planned maintenance has increased during power operation, the level of nuclear safety has improved over the

years.

## **Mochovce, Slovak Rep.**

Mission Date; 4-20 Sept., 2006

Combined probabilistic and deterministic risk assessment for the different operational and maintenance scenarios control and minimize of risk.

The risk-monitor (RM) system is implemented in NPP Mochovce for real-time evaluation of units in relation to the actual configuration of systems and equipment. Unit configuration includes system and equipment status change, mode and operational unit status change, securing of components from operation for the purposes of tests, maintenance or repair and following renewal of these components by repeated putting into operation. RM calculates new reactor core damage frequency value on the basis of executed changes and configuration of systems and equipment in relevant time. Furthermore, in cases where actual calculated risk is too high, this tool may work as an advisor identifying what equipment has to be put into operation to decrease the risk to acceptable level.

Deterministic risk analysis of outage activities using Failure Mode and Event Analysis (FMEA) methodology is applied in outage preparation. The analysis consist of listing potentially risky activities, and ranking them based on "risk index" ( frequency, potential consequences, potential of easy detection) and defining preventive measures.

## St. Laurent, France

Mission Date; 27 Nov. - 14 Dec., 2006

### ID+ challenge and innovative idea forum

As part of total quality management aiming to have innovative ideas come up from shop floor level, an innovative idea forum was put in place at the Saint Laurent plant in 2002.

Each EDF and non-EDF staff member working at the plant can suggest improvements in any given area (nuclear and industrial safety, radiation protection, environmental safety, availability, cost, working conditions, communication, organization, etc.). The first level of validation is done at departmental level. It is then submitted for plant-wide validation to the plant innovative idea committee involving all plant departments. An 'idea of the month' is thus selected every month.

At the end of the year, a challenge is organized to pinpoint the best suggestions. During this event, the best Saint Laurent ideas are selected for representation at the corporate DPN challenge.

Savings in all areas (nuclear and industrial safety, radiation protection, environmental safety, availability, cost, working conditions, communication, organization, etc.). Thanks to the current organization, relevant suggestions can be submitted to the corporate DPN innovative challenge, for enhanced performance.

With this system, working conditions can be improved, thanks to the provision of the right solution to a given issue and efforts can be acknowledged (selection of the best idea every month, prizes granted to the winners of the ID+ challenge).

The solutions offered represent gains in all areas.

The suggestions selected during the ID+ challenge are shared with other plants during the corporate DPN innovative challenge. The good practices that are chosen to win are made compulsory to other EDF plants.

### Safety Management System Concept

The plant has commissioned in 2006 a Safety Management System (SMS) which is based on ISO 9001 standard.

The initiative started after a German event in 2001. The concept is to divide plant processes. For each process there have been defined performance indicators and an owner is responsible to monitor the process. The processes are separated in three categories: leadership processes, core processes and support processes. In total there are around 70 processes. For each process, there are common structured descriptions, which are shown in comprehensive flowcharts. These flowcharts describe how the process is working, the interfaces and the distribution of responsibilities. Process owners make sure that the process functions as expected, using performance indicators. All is supported by a sophisticated computer programme.

With the implementation of this concept the plant obtains:

- a standardized structure of the main plant processes,
- ensure the processes work appropriately at the cross functional interfaces, and
- by monitoring the processes, early decline can be detected.

### Motivation programme/ professional competitions

Comprehensive motivation programmes of professional competition are implemented both at the corporate and the plant levels. There are formalized criteria and indicators for competition among the plants (such as “the best nuclear power plant in Russia”, “the best plant in safety culture”), among the plant departments (the best department of Balakovo NPP, the best control room crew, the best working place of operational personnel, ...) and among individual workers (the power industry man of the year, the best welder, the best field operator, the best electrician, ...). Regular competitions are conducted with plant volunteer fire brigades. The competitions are widely popularized by the plant means of internal communication and the winners are given financial bonuses.

List of the plant general and professional competition programmes:

- The best NPP of Russia,
- The best Balakovo NPP department for fire safety
- Balakovo NPP department of the year
- The power industry man of the year,
- The best work place of operational personnel,
- The best department in industrial safety (evaluated monthly),
- Quiz on radiological safety among Balakovo NPP subdivisions,
- Quiz and competition of plant volunteer fire brigades and subdivisions operating personnel,
- Quiz on industrial safety rules,
- The best control room crew,
- The best health physicist,
- The best field operator,
- The best electrician,
- The best welder,
- The best machinery maintenance worker,
- The best chemistry laboratory assistant,
- The best engineer,
- Competition for best training-methodological material,
- Russian Competition "Enterprise of high social effectiveness"

The use of a Human Performance Programme to develop a culture of continuous improvement.

The plant has a focus on behavioral improvements that result in prompt feedback that drives continuous improvements. The focus on behavioral improvements is evident throughout the organization including the management positions and individual contributors. Feedback is provided and accepted freely. The feedback occurs from supervisor to individual contributor, from peer to peer and from individual contributor to supervisor. The behavioral focus has become engrained in the fleet culture where emphasis is placed not only on what is done but how it is done and the behaviors exhibited. Behavioral feedback has become natural, accepted and even sought by all levels of staff and contractors.

Various tools are utilized to provide structure for the behavioral improvements. Leadership Effectiveness Logbooks are utilized as a simple means to document the coaching interaction. Goals are utilized on the number of interactions to help ensure interactions occur. The information is tabulated in a database and reviewed by the second line manager. A simplified coding system of behaviors is utilized to minimize the documentation burden. The database is used to analyze the data for trends. During refuel outages the data is compiled and analyzed daily. Behavior improvement messages are formulated based on the analysis. The message is communicated daily and represents the focus area for the next days coaching. The subsequent day's data analysis is a means of checking for penetration of the message.

The mental and physical wellbeing of the employees is monitored by observation of their behaviors. By observation of the employee, the supervisor establishes a baseline of behaviors. The supervisor observes for deviations from the established norm. The supervisor certifies monthly by signature that the observations have been made and no deviations are noted. Supervisors are trained annually on what behaviors to observe. All employees (including contractors) are covered by this programme.

The foundation for the human performance programme is based on formal procedures. The procedures describe the roles and responsibilities as well as the process elements. The procedures also describe the various behavioral traps (time pressure, shift change, etc.) and provide tools (self check, peer check, etc.) to counteract the traps.

The fundamental benefit of the focus on improving behaviors is that it results in a culture of continuous improvement. The free flow of behavioral feedback both reinforcement (positive) and correction (negative) results in continuously driving to new levels of performance. Errors are reduced and thus plant performance improved because of the feedback on human performance. Employee well being is improved because of early identifications of behavioral issues. Corrections are made before significant consequences are experienced. Additionally, the human performance programme fosters an environment which encourages the development of complementary programmes within the plant.

### Safety Days

Rivne NPP has a practice of conducting Safety Days. Conduction of such days is based on the industry level standard document "Regulations in the area of work with personnel in the operating organization" and "Regulations about Safety Day conduction, developed at Rivne NPP."

A central commission is created yearly for the conduction of Safety days. The following people are included into this commission: Director General (commission chairman), Chief Engineer (deputy chairman), and managers of the upper levels (deputies general manager, deputies chief engineer, heads of the nuclear safety department, radiation safety department, internal inspection and fire protection) as members of the commission. This commission and the yearly programme for Safety Days' conduction are approved by the plant level order.

On the last week of each quarter inspections are carried out for two-three days. They cover different activity areas:

- Radiation safety. Review of compliance with radiation control regulations during relevant processes, the state of the arrangements for radiation control and following the requirements for radiation safety during storage, transporting and handling radwaste, compliance with the license conditions for activities associated with the sources of ionizing radiation.
- Nuclear safety. Review of the issues in the area of nuclear safety, fresh fuel handling, actual state of safety systems and safety related systems as well as compliance with the requirements for their operation. Consideration of issues of implementation of the schedule for modifications and modernisations aimed at the safety improvement at the Ukrainian power units in operation, compliance with the requirements of permits and licenses for unit operation. Review of the safety culture in the departments.
- Industrial safety. Review of adequacy of compliance with the regulator requirements, correctness of processes and certificates issued after technical inspections of equipment and pipelines; following the terms and schedules for the technical inspection of the equipment. Review of the operating instructions, programmes and results of equipment and pipeline tests. Review of operational safety indicators in the departments.

The majority of the operational departments take part in these reviews. Inspections are carried out inside the departments by department commissions. The chairman of each department commission is the department head. The members of the commission are appointed by the department head, usually chosen from the administrative and engineering-technical staff. One member from the central commission takes part in the work of each department commission. After the inspections each department commission registers all the detected deviations and remarks and also states activities for their elimination with the appointed responsible persons and terms for the implementation for these activities.

The final step of Safety Days are final meetings headed by the central commission chairman. At these meetings he listens to the reports of the department commission chairmen and the members of the central commission about the state of the activities which were scheduled for the previous quarter and results of the current quarterly review. Department commissions propose organizational-technical activities to eliminate deficiencies which were detected during the conduction of the Safety Days and the sufficiency of these activities is discussed at the final meetings.

A statement is issued during the week following the Safety Days of the results of its conduction. All the organizational-technical activities, with the terms for their implementation and responsible persons, are given in the attachment to this statement.

Areas of control are distributed as follows:

- The area of nuclear safety- responsibility of Nuclear Safety Dept. Head
  - The area of industrial and technical safety- responsibility of Internal Inspection and Fire Safety Head.
  - Radiation safety- responsibility of Radiation Protection Dept. Head.
- Complex organizational issues in part of Safety day conduction are the responsibility of Rivne NPP Nuclear Safety Department.

The approach used during the Safety Days is more extensive than the typical industry practice of communicating and reinforcing safety standards. The methodology and processes used allows improvements, including cross-cutting issues which can only be resolved with the involvement of several depts., to be addressed, and hence enhance the operational safety performance of the plant

### Production Activity Planning

The main tasks of Rivne NPP production activities for each year are specified in the "Integrated Plan of Organizational and Technical activities" and put into force by a direction approved by the corporate organization. The activities are grouped in the following way:

- Quality and management systems and certification;
- Safety analyses;
- Introduction of new equipment and technologies, equipment modernisation
- Ensuring nuclear and radiation safety;
- Operation of the active core and fuel handling;
- Environmental protection and efficient employment of resources;
- Radwaste handling;
- Ensuring labour, technical and fire safety;
- Lifetime extension;
- Management of materials;
- Water chemistry, including protection from corrosion;
- Emergency response system and civil protection;
- Personnel training and preparation;
- Physical protection;
- Metrology.

The basis for incorporation of activities into this integrated plan is:

- the Strategic Programme for the corporate organization development,
- the integrated programme for modernisation and improvement of power unit safety,
- special conditions of temporary regulator permits for power unit operation,
- the list of activities for the improvement of the safety of power units which are under operation in Ukraine, and
- industry level technical decisions and other documents.

The activities from this integrated plan are included into the monthly working plans of departments. The completion of these activities is controlled on the monthly basis. The department heads report on a quarterly basis about the completion of the activities in the integrated plan.

If it is necessary to make changes in the integrated plan, such as extension of the term of the activity completion or cancellation of an activity, then the department which initiates changes requires approval of the Director General.

The department working plans include the following activities:

- Main production and safety indicators
- Personnel development activities
- Development (revision and correction) of documentation
- Improvement of the production activity of the department (separately by laboratories, groups, sections etc)
- Activities identified in the collective contract
- Activities identified in the plans from the corporate organization
- Preparation for autumn-winter and spring-summer periods
- Activities resulting from the outcome of the meeting held by a commission headed by Director General, which reviews the results for the year
- Observance of requirements of statutory and other organizational regulative documentation of Rivne NPP
- Activities in the area of modifications and modernisation
- Activities resulting from the reviews by external organizations

- Specific areas of department activities

These arrangements support an integrated approach and clear accountability whilst retaining ownership at a functional level. This approach has led to an increase in plan implementation rate and a focus on key activities to support an enhancement in the level of safety and production at Rivne NPP.