RESTRICTED

This Report is submitted to the Government of Czech Republic. Its initial distribution is restricted to the authorities concerned, the contributors to the report and responsible Agency staff. The Report will be derestricted within 90 days of the IAEA's transmittal letter unless a contrary response has been received from the Government of Czech Republic.

Only when it is known that the report has been ‘derestricted’ should this cover sheet be removed.

Division of Nuclear Safety and Security
International Atomic Energy Agency
P.O. Box 100
A-1400 Vienna, Austria

NSNI/CO-OSART/013/176

ORIGINGAL: English

IAEA
International Atomic Energy Agency

REPORT

OF THE

CORPORATE OPERATIONAL SAFETY REVIEW TEAM (CO-OSART)

MISSION

TO THE

ČEZ, a.s.

CZECH REPUBLIC

29 September to 9 October 2013

DIVISION OF NUCLEAR INSTALLATION SAFETY
OPERATIONAL SAFETY REVIEW MISSION
IAEA-NSNI/OSART/013/176

PREAMBLE

This report presents the results of the IAEA Operational Safety Review Team (OSART) review of ČEZ, a.s., Czech Republic. It includes recommendations for improvements affecting operational safety for consideration by the responsible Czech authorities and identifies good practices for consideration by other utilities. Each recommendation, suggestion, and good practice is identified by a unique number to facilitate communication and tracking.

Any use of or reference to this report that may be made by the competent Czech organizations is solely their responsibility.

FOREWORD

Director General

The IAEA Corporate Operational Safety Review Team (OSART) programme assists Member States to enhance safe operation of nuclear power plants. Although good design, manufacture and construction are prerequisites, safety also depends on the organizational factors, the ability of operating personnel and their conscientiousness in discharging their responsibilities. Through the OSART programme, the IAEA facilitates the exchange of knowledge and experience between team members who are drawn from different Member States, and corporate organization personnel. It is intended that such advice and assistance should be used to enhance nuclear safety in all countries that operate nuclear power plants.

A Corporate OSART mission, carried out only at the request of the relevant Member State, is directed towards a review of items essential to operational safety. The mission can be tailored to the particular needs of a corporate organization. A standard scope review would cover four review areas: corporate management; independent oversight; human resources and communication. Depending on individual corporate organization needs, the OSART review can be extended to additional review areas.

A Corporate OSART is an OSART mission organized to review those centralized functions of the corporate organization of a utility with multiple nuclear plant sites (and possibly conventional plant sites and other business areas) which affect all the operational safety aspects of the nuclear power plants of this utility in the phase of operation or commissioning.

Essential features of the work of the OSART team members and their corporate organization counterparts is the joint search for ways in which operational safety can be enhanced. The IAEA Safety Standards form the bases for the evaluation. The OSART methods involve not only the examination of documents and the interviewing of staff, but also reviewing the quality of performance. It is recognized that different approaches are available to an operating organization for achieving its safety objectives. Proposals for further enhancement of operational safety may reflect good practices observed at other nuclear power operating organizations.

An important aspect of the OSART review is the identification of areas that should be improved and the formulation of corresponding proposals. In developing its view, the OSART team discusses its findings with the corporate organization and considers additional comments made by corporate organization counterparts. Implementation of any recommendations or suggestions, after consideration by the corporate organization and adaptation to particular conditions, is entirely discretionary.

An OSART mission is not a regulatory inspection to determine compliance with national safety requirements, nor is it a substitute for an exhaustive assessment of a NPP's overall safety status, a requirement normally placed on the respective operating organization or operating organization by the regulatory body. Each review starts with the expectation that the operating organization meets the safety requirements of the country concerned. An OSART mission attempts neither to evaluate the overall safety of the NPPs nor to rank its safety performance against that of other NPPs reviewed. The review represents a `snapshot in time'; at any time after the completion of the mission care must be exercised when considering the conclusions drawn since programmes at operating organizations are constantly evolving and being enhanced. To infer judgments that were not intended would be a misinterpretation of this report.

The report that follows presents the conclusions of the OSART review, including good practices and proposals for enhanced operational safety, for consideration by the Member State and its competent authorities.

CONTENT

INTRODUCTION AND MAIN CONCLUSIONS 1

1. CORPORATE MANAGEMENT 3

2. INDEPENDENT OVERSIGHT 18

3. CORPORATE SUPPORT TO PROVIDE HUMAN RESOURCES 25

4. COMMUNICATIONS 36

5. MAINTENANCE 49

6. TECHNICAL SUPPORT 60

7. PROCUREMENT 69

DEFINITIONS 76

LIST OF IAEA REFERENCES (BASIS) 78

TEAM COMPOSITION OF THE OSART MISSION 82

INTRODUCTION AND MAIN CONCLUSIONS

INTRODUCTION

At the request of the government of the Czech Republic, an IAEA Corporate Operational Safety Review Team (OSART) of international experts visited the Czech Corporate organization ČEZ, a. s. from 29 September to 09 October 2013. The purpose of the mission was to review corporate functions in the areas of Corporate Management; Independent Oversight; Human Resources; Communication; Maintenance; Technical support; and Procurement. In addition, an exchange of technical experience and knowledge took place between the experts and their counterparts on how the common goal of excellence in operational safety and corporate functions could be further pursued.

The ČEZ Corporate OSART mission was the first Corporate OSART and 176th in the OSART programme, which began in 1982. The team was composed of experts from Finland, France, Romania, and the United States of America, together with IAEA staff members and one observer from France. The collective nuclear power experience of the team was approximately 270 years.

Before visiting the corporate organization, the team studied information provided by the IAEA and ČEZ to familiarize themselves with the ČEZ corporate's main features and operating performance, staff organization and responsibilities, and important programmes and procedures. During the mission, the team reviewed many of the ČEZ corporate's programmes and procedures in depth, examined indicators of the corporate performance, held in-depth discussions with the corporate personnel and visited the Temelin NPP.

Throughout the review, the exchange of information between the OSART experts and the corporate personnel was very open, professional and productive. Emphasis was placed on assessing the effectiveness of operational safety and corporate processes rather than simply reviewing the content of programmes. The conclusions of the OSART team were based on the corporate organizational performance compared with the IAEA Safety Standards.

The following report is produced to summarize the findings in the review scope, according to the Corporate OSART Guidelines and OSART guideline documents.

MAIN CONCLUSIONS

The OSART team concluded that the managers of ČEZ, a. s. are committed to improving the operational safety and reliability of their nuclear power plants and corporate processes and performance. This was clearly demonstrated by the fact that since the Corporate OSART seminar in December 2012, and preparatory visit in March 2013, the Corporate organization has introduced or extended several programmes contributing to improved performance. The team found good areas of performance, including the following:

- A proactive and targeted approach that enhances the timeliness and accuracy of regulatory and legislative safety related requirements evaluation and implementation.
- The Safety Portal implemented on the intranet of the ČEZ Group is effectively used to convey safety information throughout the whole organisation.

- A project aimed in the area of talent acquisition, the outputs of which are implemented on a routine basis by the Strategic Recruitment Section.

A number of proposals for improvements were offered by the OSART team. The most significant proposals include the following:

- The corporate organization shall organize the areas of management as an integrated level for the processes connected with activities important to nuclear safety and radiation protection.
- The corporate independent oversight should be extended to cover all corporate functions with potential impact on the nuclear safety, and in particular quality management, human resources management, procurement and strategic development.
- The corporate organization should develop a comprehensive policy addressing a succession planning which includes key performance indicators and a regular structure review by senior management of the overall succession planning program

ČEZ, a. s. management expressed a determination to address the areas identified for improvement and indicated a willingness to accept a follow up visit in about eighteen months.

1. CORPORATE MANAGEMENT

1.1. CORPORATE STRUCTURE, RESPONSIBILITIES AND LINES OF AUTHORITY

The corporate structure, including responsibilities and lines of authority, are clearly defined and communicated.

The strategic objectives, Strategic Order of the Chief Executive Officer (CEO), issued by the CEO, are clearly distributed to the different divisions. These objectives are adopted by the Division Director and transmitted (Strategic Order of the Division) to the plants and the different sections.

The Director of the Production Division has the role of Chief Nuclear Officer (CNO). He is a member of the Board of Directors and the Plant Managers report directly to him. The CNO reports regularly to the Supervisory Board on behalf of the Board of Directors.

The Management System of the company is comprehensive and covers all the areas of the company's activities. Fourteen basic areas of management have been defined, as well as, 63 management areas, and 163 processes. Twenty-three areas of management and 76 processes are related with nuclear safety or radiation protection.

All the processes connected with nuclear safety or radiation protection ("orange" processes) have been described in detail: input, output, contributors and indicators have been identified. These descriptions are also available to the regulator.

The ARIS database tool is used for management system implementation and publishing. It is very relevant and can be applied across all management levels, from CEO to particular lower management roles. The team considered this a Good Practice.

The hierarchy of documentation is clearly defined. The documentation system is complete and easily accessible on the internal website. It is supported by ECM software connected with the ARIS database. The team considered this as a Good Performance.

The Plan-Do-Check-Act (PDCA) principles are fully integrated (after a communication campaign) with the involvement of the line management (through adapted training and the contribution of a high level consultant from the automotive industry).

The Management System is large and complicated with 163 processes. The areas of management (63) and the basic areas for management (14) are not really used to perform synthesis and a vertical integration. The team made a Recommendation in this area.

The company has implemented a centralized monitoring of legislation and centralized legal and licensing support for the entire area of the Nuclear Power Plants (NPP) safety. As a result, high reliability in obtaining licenses and high reliability of the monitoring of new safety-related generally binding legal regulations has been reached. The team considered this a Good Practice.

The interpretation of legislation can cause discussion with the regulator.

1.2. POLICIES, EXPECTATIONS AND INFLUENCING PRIORITIES, PRACTICES AND BEHAVIOURS

The top management of the company has a very clear view of their role as leaders regarding nuclear safety.

- The CEO is regularly present in the plants and has direct relations with the Chairperson of the State Office for Nuclear Safety (SÚJB). His assignment for the strategic orders includes clear directions without any ambiguity for the priority for safety;
- The CNO receives a daily report from all the plants and conducts a weekly face-to- face meeting with the plant managers and the safety manager.

Evidences of involvement and leadership of high level managers in the field of safety culture was demonstrated by some examples:

- The Production Division meeting includes a dedicated time for safety in every monthly division meeting. A dedicated Division Safety Committee takes place on the following day;
- A current communication campaign on the intranet safety portal, "You decide" where top management (including, for example, the CEO and the Chief Financial Officer) present their views on safety; and
- Good communication from Temelin's plant manager after a power uprate in the plant: "nuclear safety is our priority."

Besides the National Atomic Act, a specific agreement has been signed to detail mutual expectations between CEZ and SÚJB, for example, reporting obligations and time.

As a supplement of the statutory acts, both CEZ and SÚJB consider that informal connections are essential at any level.

The relations with SÚJB are qualified as "professional" by the regulator itself.

CEZ wants to be leader in the field of Quality in the nuclear power engineering: the company aims to improve nuclear safety in the Czech Republic through execution of the NUQAS project within the framework of the Quality Council of Czech Republic. The team considered this as a Good Performance.

1.3. MONITORING, DECISION MAKING AND CORRECTIVE ACTIONS

A report is issued for each plant daily by electronic transmission, weekly in the CNO's office, monthly during the Production Division meeting, and quarterly with a detailed analysis.

Furthermore, a report from the Nuclear Inspectors is analyzed quarterly by the Board of Directors.

A safety report from the Safety Section is also analyzed annually in the Production Division meeting, and safety reporting is included on monthly basis.

There is a system of inspections, evaluations and assessments at different levels of the organization to provide assurance that the managed activities, processes, and systems are implemented in compliance with defined requirements, and that the non-conformities identified are dealt with in a timely and controlled manner. The disposition of the non-conformities from the NPPs level is connected with the corporate level.

An effective process exists to annually review every process (76) connected with safety. This evaluation is based on the PDCA principles. It is performed by both the owner of the process and the Quality and Management System section. The team addressed the fact that there is no systematic integration of the efficiency of the process and the satisfaction of interested parties, and made a suggestion in that area.

A global review of the management system is made annually and discussed with the Division Directors Committee: it includes clear decisions concerning the areas for improvement. The content of this review has been recently adapted and is now corresponding with the IAEA Safety Standards. The next review will use this model. The team encourages the company to fully follow the model

1.4. PROVIDING RESOURCES CONSISTENT WITH RESPONSIBILITIES AND NEEDS OF SITES

An annual plan (rules and regulations related to safety and availability requirements) and portfolio of specific activities listed in the Map of Risks & Opportunities of Power Plant Status Report represent the basis for the annual budget both short (Annual Assignment) and long term (Mid Term Assignment). Bottom up built budget for every plant is discussed on the divisional level, and the CNO makes the final decision on the Production Budget submitted to the management of the company during Business Review Meeting. Than proposed Production Budget is finally approved as a part of company's budget by Board of Directors Should there be any need for adjustment, it is CNO´s competence to re-structure on the Divisional Level and allocate sufficient resources to ensure all safety targets at the first.

Human resources and procurement of materials and services are discussed in in Chapters 3 and 7 of this report.

1.5. MANAGEMENT OF CHANGE

For organizational changes affecting nuclear safety (including evolutions of work jobs positions), the company performs an organizational change safety assessment. The objective is to assure prove that the organizational change concerned will not reduce or have a negative impact on activities affecting nuclear safety. This safety assessment has to be approved by the Safety Section Director.

Organizational changes covering a change in the performance of activities particularly those important to nuclear safety and radiation protection within the meaning of the "Atomic Act" have also to be authorized by SÚJB.

CEZ has very specific process for organizational changes, including safety analyses that have to be followed strictly with a great rigor. The team addressed a suggestion on this topic.

1.6. MANAGEMENT INTERFACES BETWEEN NUCLEAR AND NON-NUCLEAR GENERATION PLANTS.

The Production Division covers all the nuclear and non-nuclear areas of production.

The Production Division Safety Committee dedicated to the nuclear safety issues is conducted organized monthly.

The NPP Directors are also members of the company's safety committee chaired by the CEO.

The central management for the transmission, regulation and all relationships with the grid operator effectively and in a relevant way, takes into account safety related aspects of the NPP.

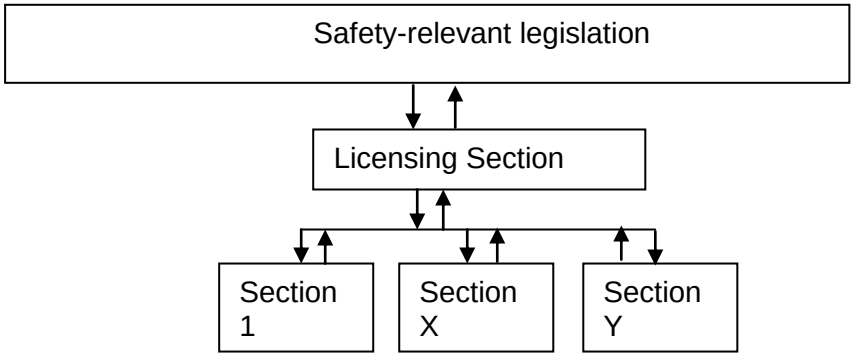
DETAILED CORPORATE MANAGEMENT FINDINGS

1.1. CORPORATE STRUCTURE, RESPONSIBILITIES AND LINES OF AUTHORITY

1.1(a) Good practice: A proactive and targeted approach that enhances the timeliness and accuracy of regulatory and legislative safety related requirements evaluation and implementation (B12 process).

Description:

The company has implemented a centralized monitoring of legislation and centralized legal and licensing support for the entire area of the NPP safety.



Advantages:

Centralized legislation monitoring and centralized legal and licensing support for the entire area of the NPP safety reduces the demands on human and financial resources several times compared to a model, under which each safety process owner and each license owner provides for the monitoring of binding legislation separately (in case of centralized monitoring, only a single check of the whole "package" of information on the new legislation is carried out, while the monitoring of legislation by individual safety process owners and license owners would result in the specific "package" being checked by each section concerned separately).

Operating results:

- High reliability in obtaining licenses.

  For the entire period of functionality of safety license for the NPP operation (since 2003), there has been no problem in obtaining licenses for the operation of the Temelin NPP due to licensing or legislative reasons (the system "guards" the validity of licenses, "guards" the fulfilment of conditions specified in the licenses).

  Maximum assurance to maintain the licenses required for the operation of the Temelin NPP has a significant economic impact (in the absence of the operation license, a daily loss solely from the production of electricity reaches tens of millions of Czech crowns).

- High reliability of the monitoring of new safety-related generally binding legal regulations.

  There have been no significant changes and no new safety-related generally binding legal regulations that would not be monitored within the framework of safety licensing for nuclear power plants process.

– From the point of view of the regulators, this organization provides an efficient integration process and a high liability regarding the respect of the deadlines. The way the legislation is implemented in detail can be an issue for discussion between CEZ and SÚJB.

1.1(c) Good practice: ARIS Tool Process Management Support in ČEZ, a. s.

Description:

Process management implementation and setup in ČEZ is required by the statutory and regulatory requirements. The "Good Practice" principle is the technique of process management implementation in ČEZ, including Nuclear Safety and Radiation Protection (NSRP) related processes. The ARIS database tool is used for management system implementing and publishing.

Process management is applied at all management levels, from CEO to particular lower management roles. Process definition is presented in textual and graphical form based on ARIS database. Because of this, process description weak points can be monitored, thus initiating improvement.

Implemented process management system contains unambiguously identified processes, particular process responsibilities, interfaces to other processes, process performance indicators and processes impact on NSRP. Process description system is closely tied in with documentation system used in the entire company, thus relating in publicity and availability from one place (intranet).

Advantages:

NSRP impact on processes and activities knowledge is used for management system changes review (process changes, documentation changes, organizational changes, etc.). Higher attention is paid to changes related to NSRP processes (graded approach) not only in the design phase, but in review and approval phases as well.

An unambiguous graphical form of implemented process is used at particular management levels.

ARIS database background features mutual interconnection of particular management levels and processes. Database outputs are fundamental for analysis and improvement.

Database use combining textual and graphical form makes the managerial work more efficient, leads to unambiguous process and accountability interpretation, clarity in NSRP related processes. All above mentioned supports clear-cut and broaden accountability in the management system and supports improvement based on knowledge of processes and activities related to NSRP.

Operating results:

Process management system in ČEZ is implemented and used by help of ARIS SW tool. The entire system is available through ARIS Business Publisher, including impact of the process on NSRP identification. Generated database outputs are used for improvement and analysis of particular processes. Via thin client, ARIS database tool is interconnected with ECM documentation management system and used to control the documentation in ČEZ, a.s. This

provides unambiguity, compatibility and recentness of data concerning company management system, available to all employees.

Process management at all management levels, NSRP related processes identification and combination of textual and graphical form is advisable for use in any utility.

1.1(1) Issue: The management areas are not considered as a level of integration and synthesis in the management system.

Fourteen basic areas of management have been defined as well as 63 management areas and 163 processes. Twenty three areas of management and 76 processes are connected with safety.

At the company level, there is a global view of the management system and its performances are regularly monitored.

At the elementary processes level, the responsibility of the process owners are clearly defined, understood and fulfilled.

Regarding intermediate levels, the owner of the area of management is responsible for setting the process structure of his management area, and has to appoint and to coordinate the process guarantors. He also establishes the management area objectives, thus supporting the objectives of the company.

However, the team has identified the following facts:

- The policies of CEZ are the Safety and Environmental Protection policy and the Quality and Management System policy. No specific statement of the managerial expectations exists regarding the main principles of action in the different areas of management;
- There are no measurable managerial goals for the 14 basis areas of management and the 63 areas of management. There is no indicator at the level of the area of management even for these connected with safety; and
- Despite the global evaluations that are made in some areas of management, the mission of the owner of the area of management does not include any evaluation of the system based on a predefined methodology that would allow allocating priorities.

Lack of integration in the management system at the areas of management level does not allow having a good vision of the areas of improvement in the different areas of management. Consequently, relevance of the improvement process may not be effective.

Recommendation: The corporate organization shall organize the areas of management as an integrated level for the processes connected with activities important from the point of view of nuclear safety and radiation protection.

IAEA Basis:

GS-R-3

3.8. Senior management shall establish goals, strategies, plans and objectives that are consistent with the policies of the organization.

3.9. Senior management shall develop the goals, strategies, plans and objectives of the organization in an integrated manner so that their collective impact on safety is understood and managed.

3.10. Senior management shall ensure that measurable objectives for implementing the goals, strategies and plans are established through appropriate processes at various levels in the organization.

3.11. Senior management shall ensure that the implementation of the plans is regularly reviewed against these objectives and that actions are taken to address deviations from the plans where necessary.

6.2. Senior management and management at all other levels in the organization shall carry out self-assessment to evaluate the performance of work and the improvement of the safety culture.

GS-G-3.1

2.23. The individual in the most senior managerial position in the organization should be responsible for ensuring that the management system is implemented. Implementing the management system demands the collaborative efforts of managers, those performing the work and those assessing the work. For satisfactory implementation, planning and the deployment of adequate resources are necessary. All individuals should be trained to achieve proficiency. It should be ensured that all individuals understand the management processes that apply to the performance of their work. The effectiveness of the management system should be assessed and reviewed at all stages of implementation. The information gained from assessments should be used to achieve continuing improvements in work performance.

3.10. As part of the management system, senior management should develop and disseminate throughout the organization a documented set of policies that establish the management's plans, objectives and priorities with regard to safety, health, environmental, security, quality and economic considerations.

The policies should reflect the commitment of senior management to attaining their goals and objectives; their priorities; and the means by which continual improvement will be implemented and measured.

3.11. The policies:

- Should be appropriate to the purpose and the activities of the organization and should contain statements on safety, health, environmental, security, quality and economic considerations;
- Should include a commitment to comply with management system requirements and to seek continual improvement;
- Should be aligned with and should support the development of a strong safety culture;
- Should reflect relevant statutory requirements;
- Should provide an appropriate framework for action and for establishing and reviewing goals and objectives;
- Should be reviewed periodically for their continuing suitability and applicability;
- Should be effectively communicated, understood and followed within the organization;
- Should commit management to providing adequate financial, material and human resources.

5.16. Senior managers should not feel they have to 'own' all the processes personally. However, they should use information about the processes from the process owners to help them direct and manage the organization.

6.12. Individuals and management (other than senior management) at all levels in the organization should periodically compare present performance with management

expectations, worldwide industry standards of excellence and regulatory requirements to identify areas needing improvement.

6.13. Each unit within the organization should routinely conduct its own self-assessments of processes and performance.

6.14. Managers and individuals should seek continual improvement by identifying areas needing improvement and then taking corrective actions. The need for improvement should be recognized as a normal part of routine work.

6.15. Senior management should reinforce a questioning attitude in individuals and should encourage the discovery and reporting of all areas needing improvement. Managers should avoid punishing or intimidating individuals for unintentional errors and should not react defensively to suggestions for improvement.

1.3. MONITORING, DECISION MAKING, AND CORRECTIVE ACTIONS

1.3(1) Issue: The reviews of activities connected with safety in the management system are focused on checking compliance without systematically reviewing efficiency.

All the processes connected with safety have been described in detail with input, output, and indicators. An effective process is used to review yearly every process (76) connected with safety. These evaluations based on the PDCA principles are performed by both the owner of the process and the Quality and Management System section. However, the team observed the following:

- These evaluations do not integrate any analysis of the efficiency of the processes and the satisfaction of interested parties;
- There is no regular analysis of the interactions between different processes; and
- An analysis is performed yearly at the company level (Division Directors Committee meeting including the CNO and the CEO). After a self-assessment against the IAEA Safety Standards, the decision has been taken to extend the scope of this review to the feedback on the satisfaction of interested parties, the result of benchmarking activities and other topics. This is not yet fully implemented.

Without regular review of activities connected with safety in the management system with the objective of efficiency and capability to achieve the managerial objectives relating to improvements and the satisfaction of interested parties, the corporate organization could miss opportunities to improve safety.

Suggestion: The corporate organization should consider improving the way to conduct the reviews of activities connected with safety in the management system by systematically reviewing efficiency.

IAEA Basis:

GS-R-3

3.6 The expectations of interested parties shall be considered by senior management in the activities and interactions in the processes of the management system, with the aim of enhancing the satisfaction of interested parties while at the same time ensuring that safety is not compromised

3.13. An individual reporting directly to senior management shall have specific responsibility and authority for:

- Coordinating the development and implementation of the management system, and its assessment and continual improvement;
- Reporting on the performance of the management system, including its influence on safety and safety culture, and any need for improvement;
- Resolving any potential conflicts between requirements and within the processes of the management system.

5.1. The processes of the management system that are needed to achieve the goals, provide the means to meet all requirements and deliver the products of the organization shall be identified, and their development shall be planned, implemented, assessed and continually improved.

5.2. The sequence and interactions of the processes shall be determined.

5.3. The methods necessary to ensure the effectiveness of both the implementation and the control of the processes shall be determined and implemented.

5.9. The work performed in each process shall be carried out under controlled conditions, by using approved current procedures, instructions, drawings or other appropriate means that are periodically reviewed to ensure their adequacy and effectiveness. Results shall be compared with expected values.

5.10. The control of processes contracted to external organizations shall be identified within the management system. The organization shall retain overall responsibility when contracting any processes.

6.10. The review shall identify whether there is a need to make changes to or improvements in policies, goals, strategies, plans, objectives and processes.

GS-G-3.1

2.5. In an integrated management system, all goals, strategies, plans and objectives of an organization should be considered in a coherent manner. This implies:

- Identifying their interdependences and their potential to impact on each other;
- Assigning priorities to the goals, strategies, plans and objectives;
- Establishing procedures to ensure that these priorities are respected in decision making.

2.28. There should be a clear understanding of the division of responsibilities and the working relationships between all organizational units participating in or supporting the management system. Such units include centralized corporate and technical Sections providing support, and company safety committees. They also include public services such as fire services and medical services.

3.8. Every organization has interested parties (also known as ‘stakeholders’), all of whom have needs and expectations. In order to ensure that the formally agreed expectations of interested parties are determined and met and to enhance their satisfaction, senior management should identify all of the organization’s interested parties and should understand their ‘products’ or interests and their requirements, needs and expectations.

5.3. In determining to what extent a process should be documented, the organization should consider factors including the following:

- The effects of the process on safety, health, environmental, security, quality and economic elements;
- Statutory and regulatory requirements;
- The satisfaction of interested parties;
- Economic risk;
- Effectiveness and efficiency within the organization;
- The competence levels of individuals;
- The need to retain process knowledge;
- The complexity of processes.

1.5 ORGANIZATIONAL CHANGES

1.5(1) Issue: Some important changes that influence to the whole organization are prepared by a small group of senior managers without the input of the safety sections. In such a case, the safety evaluations are made at the end of this process.

There are corporate guidelines for managing the organizational changes, including classification according to the importance from the nuclear safety point of view.

Nevertheless, the team observed the following:

- Announcement through the corporate intranet of an organizational change before the safety assessment has been requested.
- SÚJB raised a concern of difficulties in the safety assessment of the corporate level organizational changes.

Without a systematic and timely contribution of the safety sections into the organizational changes process there is a risk of making decisions that could have a negative impact on safety.

Suggestion: Consideration should be given by corporate management to strictly follow the procedures for the organizational changes to ensure that the safety assessment is performed in the initial phase.

IAEA Basis:

GS-R-3

5.28. Organizational changes shall be evaluated and classified according to their importance to safety and each change shall be justified.

5.29. The implementation of such changes shall be planned, controlled, communicated, monitored, tracked and recorded to ensure that safety is not compromised.

GS-G-3.1

5.56. When organizational change is necessary, no reduction in the level of safety achieved should be acceptable, even for short periods of time, without appropriate justification and approval.

5.58. When major organizational changes are planned, they should be rigorously and independently scrutinized. Senior management should remain aware that it has the ultimate responsibility for safety and should ensure that safety considerations are given a priority commensurate with their significance during any process of major change.

5.61. Senior management should develop a specific process to manage and review organizational changes. The process should ensure that there is no degradation in the safety culture of the organization.

5.62. A safety assessment should be developed for any changes that have the potential to affect safety. For more significant changes, advice should be sought from internal and external experts.

5.64. Communication with interested parties, including individuals, should be carried out honestly and openly, addressing the safety implications and other implications of the changes and explaining the steps being taken. The appropriate mechanisms for the feedback of information to monitor the effects of the changes that are implemented should be set up.

5.65. For each change, the project leader should apply a systematic and transparent project management process, the rigour of which should be commensurate with the significance of the change. In parallel, senior management should consider the overall integration of all changes, and should oversee very significant changes that are imposed and the cumulative effects of smaller changes that may interact with each other. Effects on ongoing activities during the implementation of changes should be studied well and given careful consideration.

5.67. The interactions between different changes should be given careful consideration. Changes that on their own may have only a limited effect on safety may combine and interact to produce much more significant effects. Where possible, different initiatives for changes that are pursued at any one time and that may affect safety should be minimized. In addition, the total workload imposed on the organization to implement the changes in parallel with continued operational activities should be given careful consideration.

5.69. Preferably, one individual should approve each change, and the change should be endorsed by those individuals whose areas of responsibility are most affected. This should be given particular importance when the activities that will permit the change to be made are the responsibility of different parts of the organization. Evidence that the change satisfies safety requirements should be made available and an endorsement should be sought from the organization's safety unit. The approval should indicate whether an independent review has been carried out and how the recommendations from the review, if any, have been addressed.

5.71. Adequate monitoring should be carried out to provide early warning of any effects on performance, thereby ensuring that there is sufficient time to take remedial action before acceptable safety levels are challenged. Wherever possible, such remedial action should be planned in advance. Care should be taken in choosing the measures to be monitored and in assessing their effectiveness in providing early warning of any trend towards deterioration. Changes with the potential for major effects on safety levels should be subject to more extensive monitoring to detect adverse trends earlier. The likely effectiveness of changes should also be considered and the speed with which a situation that may be critical to safety can be rectified should be assessed.

2. INDEPENDENT OVERSIGHT

2.1. FUNCTIONS COVERED BY INDEPENDENT OVERSIGHT

Corporate level independent oversight is the responsibility of the Safety Inspectorate of the ČEZ Group (IBS). IBS is a fully independent corporate unit from the line organization, and it reports directly to the CEO and the Board of Directors throughout nuclear safety area.

The Independent Oversight Section was established in ČEZ in 2007 as part of the Safety and Quality Management Section. In 2011, IBS was separated and placed into the CEO's Division. The description and evaluation of the respective IBS functions are defined in the Management Manual of the IBS (ČEZ_UI_0001).

The main activities IBS include:

- independent oversight and feedback for strategic management with respect to the various safety areas (see B01 to B12 below) in the ČEZ Group;
- internal and external benchmarking;
- overseeing the safety and environmental protection activities of segment units for safety management;
- verifying the settings and functions of the management systems for various safety areas in the ČEZ Group;
- providing guidance in the areas of occupational health and safety and environmental protection for international acquisitions by ČEZ, a. s.;
- monitoring principal events and activities that influence the value of assets and risk management in the areas of safety;
- support to and acts as a secretariat of the Corporate Safety Committee of ČEZ, a. s.;
- proposing input to and updating the Safety and Environmental Protection Policy;
- annual safety reports of the ČEZ Group;
- monitoring and evaluating the safety culture in the ČEZ Group; and
- providing for the setting of the experience sharing and exchange system in the ČEZ Group.

The divisions of ČEZ and integrated subsidiary companies are grouped into two safety management segments. The safety management function within the Production Segment is executed by the safety section of the Production Division (PD Safety Section) reporting directly to the Chief Production Officer. The PD Safety Section also performs oversight functions that are partially independent from the line organization within the Production Division. The respective structure is within the Distribution Segment.

The PD Safety Section has the ownership for the following safety areas within the Production Segment (that are also designated as separate processes):

B01 Technical safety
B03 Fire protection
B04 Nuclear safety
B05 Occupational safety
B07 Physical protection of nuclear facilities and materials
B08 Radiation safety
B09 Environmental safety

B10 Emergency preparedness
B12 Licensing safety

In these areas the PD Safety Section manages and ensures continuous oversight with regard to compliance with nuclear and the other above mentioned safety areas.

IBS functions are more oriented on the performance related issues, while compliance oriented functions are the responsibility of the safety management units within the segments, and in case of nuclear operations, particularly a component in the PD Safety Section. The main focus of IBS is nuclear safety and their oversight and reporting on the other safety areas are specifically directed to any significant issues, and acting when there are concerns with regard to trends in the other safety areas.

During the OSART review process it was evident that the cooperation between these two units, i.e. IBS and PD Safety Section worked well at the management level, and this cooperation provided a good setup both for the effective functional cooperation in the plant level, and for the continuous improvement in nuclear safety.

The interface between IBS and the SÚJB is working well. This practice allows good profound discussions with the top management of the SÚJB. All the official communication with SÚJB is defined to take place through the PD Safety Section.

The team made a recommendation that the corporate independent oversight should be extended to cover all corporate functions with potential impact on the nuclear safety, and particularly quality management, human resources management, procurement and strategic development.

The team noted it as Good Performance in that the three-level safety oversight structure has been implemented in the ČEZ Group comprising corporate level independent oversight, segment (divisional) level oversight functions, and executive (power plant) level oversight functions.

2.2. ORGANIZATION AND STAFFING OF INDEPENDENT OVERSIGHT

The corporate level independent oversight IBS consists of eight highly qualified individuals with experience and independence. The overall years of nuclear experience are more than 200 for the IBS staff. The current staffing levels are adequate to perform the required functions.

The individual job descriptions are detailed in IBS's Management Manual, and all the defined tasks are supported with a reference to a respective document. The job description of the IBS Director is described in Document CEZ_PA_0017 that defines the job descriptions for the directors.

All the personnel performing safety management functions in the PD Safety Section have a defined qualification profile, and there are well-defined and documented training and examination programs. These are presented in the Licensing Document and monitored through the SAP system.

There are nuclear safety committees at three levels: the nuclear power plant level, the Production Division level, and the corporate level, and these committees meet regularly. The

committees are mainly manned with in-house management level people. Only the corporate level safety committee has a few members from outside the utility.

The corporate level safety committee is chaired by the CEO. It has at least four meetings during each year. The meetings have a special theme such that the first meeting evaluates the previous year, the second meeting treats the human performance related issues and the third meeting is dedicated to the matters related to SÚJB. The fourth meeting is for current issues. Recently, the fourth meeting focused on the post-Fukushima issues, and the related action plans.

As the corporate level safety committee consists mainly of people employed by the ČEZ Group, the independent external input is quite limited. In addition, the Chairperson of SÚJB is a permanent invitee. Therefore, the management of ČEZ is encouraged to consider ways to increase the number of external independent members in order to obtain further independent input for improving the safety performance.

2.3. REPORTING

Both the IBS and the PD Safety Section issue written safety reports regularly.

The IBS Director presents personally:

- a monthly report to the CEO;
- quarterly reports to the Board of Directors; and
- an annual report to the CEO for further discussion by the Corporate Safety Committee.

During the OSART Corporate review, the oral reporting of the IBS director to the CEO based on the monthly safety oversight report was discussed in more detail. The scope of the report covers the main issues of the safety areas from B01 to B12, as given above, but the clear emphasis and priority of oral reporting is centred on the issues related to nuclear safety.

The IBS staff communicates the reports to the management of Production Division, and in to the nuclear power plant managers.

The PD Safety Section provides much more detailed monthly safety reports and annual report with emphasis on the operating experience. These reports are also communicated up to the Group Management, i.e. the CEO and the Board of Directors.

IBS also informs relevant levels of the line organization. In their reporting, they have the full right and responsibility to escalate the issue to upper levelmanagement in the event this information is not acted upon.

The reporting of Independent Oversight fulfils both the requirements of the IAEA Safety Standards, as well as, the expectations of the Group Management.

The safety events information transfer has had occasional failures in sufficient early communication up to the top levels of the Group. The team observed that IBS has started the efforts for eliminating early communication failures in exceptional situations, such as the responsible person being ill or outside the reach of a cellular network. The team encourages CEZ to continue and complete the project of safety events information exchange in order to eliminate any potential human errors in the information flow chain.

2.4. WORKING METHODS

The document SKČ_PP_0080 (Independent oversight and feedback in safety) defines the responsibilities and authorities to conduct independent safety oversight. Safety reviews are carried out in accordance with ČEZ_ME_0929 (Safety peer reviews). They are independent, cooperative, proactive, and periodic reviews carried out for each area in a four-year cycle. They are implemented in cooperation between the IBS, PD Safety Section and the Quality and Management System Section according to an approved annual plan.

Additional checks and reviews can be carried out beyond the framework of the approved plan. The outcome of the check or review is a final report along with proposed corrective measures to avoid recurrence of the deviation. The monitoring of a selected safety area or site is a daily routine activity of the IBS Section inspectors. The inspectors obtain data and information for monitoring by continuously tracking reports, messages, minutes, conclusions, protocols, evaluations, findings, etc., and also by participating in selected events, and by means of walkthroughs and inspections. The data is then analyzed and written outputs are created.

For inspectors monitoring cross-cutting areas of safety across the ČEZ Group, the outputs include a monthly report to the CEO and an annual report on the safety of the ČEZ Group. For the inspectors working at NPPs, another important output is a report on the monitoring of nuclear activities.

The IBS experts onsite and a representative of the PD Safety Section regularly attend the weekly plant management meetings. Both the IBS and PD Safety Section have free access to all plant related information.

IBS is responsible for managing the Safety and Environmental Protection Policy, and for monitoring and assessing the safety culture in the ČEZ Group. The safety culture principles are integrated into the Safety Policy, and it is the responsibility of the IBS to carry out safety culture surveys in the ČEZ Group and cooperate with the segment and executive level safety managers. The safety culture surveys take place in three year intervals at least within the scope of all units, whose activities have influence on the nuclear safety. The safety culture surveys have a particular objective to contribute to the continuous improvement of safety. The team noted that the survey results are not fully consistent with the safety culture observations of the recent OSART missions to Dukovany and Temelin. The team encourages the safety management to further employ the full set of safety culture assessment methods to complement the safety culture survey evaluations.

The team noticed it as Good Performance that CEZ Corporate has developed a way to execute the Safety and Environmental Protection Policy by selecting annually a specific focus area and communicating it effectively for the organisation.

The team also noticed it as Good Practice that the Safety Portal has been implemented on the intranet of ČEZ Group and it is effectively used to convey information from safety areas through the whole organisation.

DETAILED INDEPENDENT OVERSIGHT FINDINGS

2.1 FUNCTIONS

2.1(1) Issue: The IBS' safety oversight and reporting does not systematically cover all the corporate functions with potential impact on safety.

IBS has overseen and reviewed some corporate functions and provided the appropriate review reports as required for independent oversight and feedback for strategic management with respect to compliance with the various safety areas in the ČEZ Group. However some other corporate functions that potentially impact nuclear safety have not been systematically reviewed until now by the IBS. These include: quality management and the management system, human resource management, procurement and strategic development.

Without systematic oversight and reporting that covers all corporate functions with potential impact to safety, the organization may lose opportunities for improvement.

Recommendation: The corporate independent oversight should be extended to cover all corporate functions with potential impact on safety.

IAEA Basis:

SSR-2/2

Requirement 9: Monitoring and review of safety performance

The operating organization shall establish a system for continuous monitoring and periodic review of the safety of the plant and of the performance of the operating organization.

4.33. An adequate audit and review system shall be established by the operating organization to ensure that the safety policy of the operating organization is being implemented effectively and that lessons are being learned from its own experience and from the experience of others to improve safety performance.

4.36. The persons and organization performing quality assurance functions shall have sufficient authority and organizational independence to identify problems relating to quality and to initiate, to recommend and to verify the implementation of solutions. These persons and organizations shall report to a high level of management such that the necessary authority and organizational independence are provided, including sufficient independence from costs and schedules when considering safety related matters.

GS-R-3

6.3. Independent assessments shall be conducted regularly on behalf of senior management:

- To evaluate the effectiveness of processes in meeting and fulfilling goals, strategies, plans and objectives;
- To determine the adequacy of work performance and leadership;
- To evaluate the organization's safety culture;

- To monitor product quality;
- To identify opportunities for improvement.

2.4. WORKING METHODS

2.4(a) Good Practice: Safety Portal

The Safety Portal implemented on the intranet of the ČEZ Group is effectively used to convey information from safety areas through the whole organisation. Its development was a joint effort between the communication team, IBS Independent Oversight and the Production Division's Safety Section. The Safety Portal is used to share information with respect to current activities, events, operations and their safety-related outputs, including the major risk items in the ČEZ Group. The main strength of this site is that safety information is gathered in one place.

The Safety Portal also contains important links, such as current information on changes in Czech legislation at the safety area. A top document in the area of safety – Safety and Environmental Protection Policy— is clearly presented, and it introduces topical information with regard to the annual safety focus area.

The Safety Mailbox is imbedded into the Safety Portal to provide a channel for each employee of any ČEZ Group company, where they can raise questions or concerns regarding any aspect of the safety. There is also a "My View" section where the CEO and top managers have made a statement about safety.

The Safety Portal is administrated by the IBS section. Between January and September 2013, there were more than 23,000 hits indicating that the Safety Portal contributes significantly to the enhancement of the safety culture.

Other benefits of this portal are:

- Information sharing: The employees can share interesting personal experience with safety.
- Current information flow: "Hot Topic" area for the statistics and analysis reports concerning safety events, such as injuries, fires and environmental accidents. The portal is updated every few days.
- Safety risk highlights: such as the stress tests, Dukovany's long term operation and contractor supervision. This creates an awareness of risks.

3. CORPORATE SUPPORT TO PROVIDE HUMAN RESOURCES

3.1. ENSURING AVAILABILITY OF APPROPRIATE STAFF THROUGH RECRUITMENT, SELECTION AND HIRING

The Human Resources Section has implemented a comprehensive and strategic plan that provides for a proactive approach to selection strategies. This process is well documented and linked to the company's overall business plan, including that of NPP operations. It begins with well-established alliances with local schools, universities and media venues. There is a strong analytical process established for retirement calculations that forecast attrition in five year intervals. As a part of the selection process, there is an established core of validated competences along with the Psychological Diagnostics Centre that issues for further analyses in linkage to the actual positions at NPP. The organization has a very low attrition rate of approximately 1.5% annually, which allows for a timely and thorough transfer of knowledge. To support all of the above activities the company has multiple initiatives in the area of scholarships, apprentice programs and internships. The team has identified the above as a Good Practice.

There is an opportunity for the Corporate Organization to consider working in conjunction with the NPPs and develop an observation program which reinforces management safety and training expectations. The team has identified this as a Suggestion.

3.2. KNOWLEDGE MANAGEMENT

The risk associated with the potential loss (attrition) of key personnel undergoes a constant evaluation. A systematic approach is in place which has objective evidence, is well institutionalized and is providing the intended results.

The goal of Knowledge Management (KM), which is to provide for the safe and effective operation of the unit, is being met and the tools and the proper layers of reviews are well established.

Main activities include:

- Partnership between corporate and NPPs to identify the key knowledge and key knowledge holders;
- Reconciliation of the above point with the strategic five year forecast work force planning model; and
- A well-documented reference system to analyze progress and gaps at any point necessary.

The institutionalization of this process allows for a well-documented on-going oversight program. This approach significantly reduces the risk of knowledge loss which could impact the safe and reliable operations of the plant.

The team has identified the above as a Good Practice.

3.3. CORPORATE COMPENSATION POLICY

To define the compensation each position is classified according to the job evaluation methodology. The standardized method allows for the evaluation of the complexity, responsibility and difficulty of the work being performed in order to insure internal equity. The nuclear compensation criteria takes into consideration the demands and complexity of the nuclear operations environment.

This assures that positions that have influence for nuclear safety are classified with higher grades than similar positions without the same demands. This maintains their competitive position within the labour market and internal equity within the company, which in turn resolves industry low attrition rates.

The compensation package is comprised of Base salary, Variable pay, Premiums, Benefits and other reward tools. In addition, there are multiple parts in the policy directly linking rewards to nuclear safety performance.

Rewarding of the staff of ČEZ is governed by the Labour Code, rules of tariff or contractual wages, which are part of the applicable collective agreement and the company‘s applicable internal managing documents.

The variable pay portion of the plan is exercised by the leaders at year end performance review, and is measured against the goals of the employee, but also based on the performance of the division, the company and the individual. This is aligned and is very similar to other well-established compensation programs for companies of this size.

3.4. SUCCESSION PLANNING

At the time of this review there was no formal succession planning policy in place for the NPPs. Discussions do take place, but do not follow a prescribed set of criteria or policy. This is an area where it is important to safety and reliability of operations that key personnel are meeting or exceeding expectations in knowledge and command of their responsibilities. This is also important for a well-documented rotation, mentoring, career planning and other industry training initiatives and programs. The team proposed a Suggestion in this area.

3.5. INDIVIDUAL PERFORMANCE ASSESSMENT

At the ČEZ Group level, a unified methodology for assessing employees with contractual wages has been applied since 2008. In March, the employees are evaluated in terms of performance of their previous year’s objectives (WHAT) and in terms of their professional behaviour, with respect to Our Principles (HOW). This assessment is done by the direct superior, and has a direct link to the variable part of the remuneration. The final amount of the variable part is also affected by company, division and section performance.

Aspects that influence the Variable part of compensation are: Company financial performance, Division Performance, Section Performance, Individual Performance and Behaviour (Our Principles). Safety goals are involved in evaluation of the Division Performance (Company level indicators are included),, and employee Behaviour for every employee. Section Performance and Individual Performance cover safety goals where applicable (especially Safety Section and Nuclear Power Plants).

The target setting process is a top-down process which starts by defining the main strategic goals by the Supervisory Board and the Board of Directors. After that, the main strategic company goals are detailed in the Strategic Order of the Chief Executive Officer (CEO) for each specific year. The Key Performance Indicators (KPIs) linked to the safety are a significant and introducing part of the Strategic Order.

Based on the Strategic Order of the CEO, the strategic company goals are rolled down into the Division by the Strategic Order of the Division Director together with safety KPIs. This order sets Division and Section goals. Production Division Strategic Order contains key safety goals for nuclear safety.

Individual objectives are set by the direct supervisor according to Strategic Order of the specific Division during the Annual Appraisal when evaluation of past period objectives and behaviour is also completed. This interview provides feedback for both participants (employee and superior). A completed Appraisal Form is signed by direct superior and the employee.

The Compensation Section analyses systematically the setting of the goals to ensure that the top down roll-on of the goals is completed. It also analyses the results of the Annual Appraisal Forms to support the next development of Individual Performance Management process.

3.6. LABOUR RELATIONSHIP, UNION AFFAIRS

The rules for relationships with the trade unions are established in Act No. 262/2006 Coll., Labour Code, and the collective agreements entered into between the respective trade unions and the employer (collective agreement of ČEZ for the period of 2007 - 2014).

At least once a month there are negotiations between trade union representatives and the employer‘s representatives regarding obligations under the collective agreement, and to discuss organizational changes and documents relating to working and wage conditions.

Regarding collective bargaining, there are currently valid collective agreements of ČEZ for the period of 2007 - 2014. Every year there are negotiations on amendments to the Collective Agreement relating primarily to wages and other topical issues.

The strike rules are established in Act No. 2/1991 Coll., on collective bargaining. Under that Act, the strike of the staff operating nuclear power plant equipment and equipment with fissile material is prohibited.

Complaints and comments arising from labour-law relations are handled by the respective trade union organizations or executive employees (in accordance with the Collective Agreement), or the employees can raise their complaints in accordance with the appropriate guidelines.

DETAILED CORPORATE SUPPORT TO PROVIDE HUMAN RESOURCES FINDINGS

3.1. ENSURING AVAILABILITY OF APPROPRIATE STAFF THROUGH RECRUITMENT, SELECTION AND HIRING

3.1(a) Good Practice: Talent Acquisition process

Description

The number of technical graduates was decreasing in the past. This is due to the demographic decline and the low interest of new students in technical fields. The shortage of personnel can place at risk the safe operation of nuclear facilities and CEZ Group's long-term goals. CEZ Group is facing the demographic challenges based on the career preferences of new students. Four years ago the Human Resources Section launched a project aimed at the talent acquisition area, the outputs of which are implemented on a routine basis by the Strategic Recruitment Section.

Objectives of these efforts are as follows:

- Increase the attractiveness of technical fields for new students and their parents;
- Attract new students to be interested in the field of power generation; and
- Develop "the pipeline" to obtain the necessary number of technical graduates to become qualified employees.

The target group of recruiting activities are students of elementary and high technical schools and their associated faculties in order to influence their future career choice. The success of attracting talent depends on the cooperation with schools of all grades, parents of students, authorities such as the Ministry of Education, and all types of media venues.

Benefits

- A strategy that increases the venues for attracting talent and targets public relations and marketing activities for attraction of new talent.
- An established and formal relationship between CEZ and educational institutions.
  The activities for talent acquisition include discussion forums of CEZ experts with students, financial support to schools to purchase aids for teaching physics. CEZ employees also participate in school open days and career and employment opportunity fairs. The offers include excursions and practical trainings for students, scholarship programs, thesis topics, and various contests.
- Scholarships and research fellowships that make power industry jobs more familiar.
  A special workshop for Nuclear or Power Industry Certificate is intended for high school student improvements to increase their familiarity with the operation of nuclear, coal-fired power plant and electricity distribution equipment. Students of technical faculties interested in the power industry have possibility to attend a 14-days summer training program at the Temelin and Dukovany NPPs. During this program, selected students who show interest to work in CEZ Group might become eligible candidates for positions. These students are offered scholarship contracts. The students also receive financial support during their studies and commit themselves to work in their respective positions in the future.

- CEZ Group has built up a network of partnering technical high schools and faculties, consisting at present of 49 high schools and 13 faculties, with which long-term partnering contracts have been reached. The core of the cooperation is to enhance the quality of learning in technical fields and commence cooperation with young engineers already during their studies. Part of the cooperation with schools are efforts in support to open new fields of study, from which graduates would be prepared to work in the power industry (such as newly opened Power Engineering Program at the Industrial High School in Trebic or modified study programmes at the Industrial High School in Ceske Budejovice).
- Established and known employer brand for communication, marketing and public relations support.
  This employer brand has been created to convey the benefits of working for the CEZ Group. "Where else" is a proven brand that provides a message that CEZ Group has a unique employment opportunities and growth potential. The attractiveness of the technical studies and jobs in power engineering is enhanced through intensive cooperation with media.
- Power engineering related quizzes are offered on websites to engage young people which allows for information to be gathered for students interested in technical fields. Examples are technology and power engineering (such as CEZ's World, Electricity is cool! and Cool summer job!)
- CEZ Group uses a dedicated www.kdejinde.cz (”where else”)website consisting of separate zones for students, educators, and job applicants. In order to address young people, a purpose-made Facebook profile “Job in CEZ” was created which over the time of its existence has attracted almost 7000 friends. Students and candidates for jobs in CEZ are addressed in regular quarterly newsletter.
- The partnership with the Union of Czech Mathematicians and Physicists, and the organizer of Math and Physics Olympiads in support of technical studies.
- The quality of recruitment and hiring programme exceeds industry standards as a result of a structured psychological diagnostics system that has been created and, applied in the long term, and developed, focusing on the complex verification of psychological competence for the positions of operational staff and monitoring and reactor physicists, and the subsequent periodic verification of competence during their careers. The psychological potential of candidates for other key positions in nuclear power plants is also verified. As part of recruitment support activities (Summer University, Nuclear Graduation), psychological screening examinations are carried out to map the suitability of future human resources to work in the NPP. The psychological diagnostics system also includes the verification of psychological competence of the NPP's staff (employees of ČEZ and contractors) for individual entry to the NPP, aimed at predicting safe and reliable behaviour inside the guarded area.
- The Psychological Diagnostics Section works closely with other Production Division sections (e.g. Safety, Dukovany NPP, Temelín NPP), and in particular on projects related to improving safety and reliability of personnel in order to minimize human errors and suggest corrective actions in this area. For example:
  - Psychological analysis of selected aspects of specific activities in the shift operation of the Temelin NPP
  - Psychological profiling of desirable characteristics for the positions of members of the Stand-by Emergency Response Organization

  - Psychological selection of candidates for these positions
- The Psychological Diagnostics System allows the prediction of safe and reliable work performance of operational staff and monitoring and reactor physicists in the NPPs and thus affects the ability to safely operate nuclear installations for a long time in terms of human resources. It also enables the prediction of adequate and reliable behaviour of all of the NPPs' personnel in the guarded area in order to eliminate risk behaviour in relation to nuclear safety and the nuclear installation. With its professional operations, the Psychological Diagnostics Section therefore significantly contributes to the safe, reliable and long-term operation of the NPPs in terms of human resources.

Results

- CEZ Group was recognized as "The Most Desired Employer" by students (in the three previous years CEZ Group has not ranked worse than the 2nd)
  - The Most Desired Company in the Employer of the Year awards
  - Clear Choice in the TOP Employer of the Year
  - Survey of Trendence Institut GmbH Berlin, Germany
- The personnel needs are being met in a timely and quality manner. As a result of the above initiatives, the time-to-hire metrics are top quartile in the industry and there is an established and rigorous pipeline for the future needs of the CEZ group.
- Number of students hired by the company

	2009	**2010**	**2011**	**2012**	**06/2013**
Number of new entries	932	798	653	741	366
Number of graduates from new entries with attrition <5%	50 (5.4%)	51 (6.4%)	47 (7.2%)	44 (5.94%)	7

	2010	**2011**	**2012**	**06/2013**
Number of new entries of operators	16	18	11	9
Number of new entries of operators based on scholarships	2	13	9	7
Meets expectations	100%	92%	100%	100%

3.1(1) Issue: There is no formal training observation and evaluation program conducted by management to provide just-in-time feedback and reinforce safety and value of training.

The team observed following:

- There are no mandatory just-in-time training observation requirements in the current training feedback policy for NPPs and corporate leaders with support responsibilities for NPPs.
- There is no appropriate tool available to identify, monitor and provide feedback to instructors from observation which can result in:
  - A variance from desired leadership expectations
  - Inability to provide positive and immediate feedback to instructors to demonstrate desired behaviours
  - A lack of an established methodology to conduct independent verification in order to ensure completed actions to correct inappropriate / undesired behaviours
  - The absence of a formal independent training observation program can result in missed opportunities of early detection and corrective actions, by the NPPs and corporate managers with support responsibilities for NPPs.

Suggestion: The organization should consider developing a program which reinforces management's safety and training expectations.

IAEA basis:

NS-G-2.8

4.1. The operating organization is responsible for training its own staff and ensuring that contractors' staff are suitably trained and experienced so that all work is carried out safely. The operating organization is also required to make sure that all personnel who are assigned duties that can affect safety have a sufficient understanding of the plant and its safety features and sufficient competence, in areas such as management and supervisory skills, to ensure safe operation of the plant. This requires that staff competence be sustained by regular training and review, and that development programmes be used to ensure the continuous availability of competent staff to meet the needs of the organization, with account taken of retirements and promotions.

4.18. The training of control room operators should include, as a minimum, classroom training, on the job training and simulator training. The classroom training and on the job training should be planned and controlled to ensure that all necessary objectives are achieved during the training period. Simulator sessions should be structured and planned in detail to ensure adequate coverage of the training objectives and to avoid possible negative training due to the limits of simulation. The sessions should include preliminary briefings and follow-up critiques.

4.21. All progress made in training should be assessed and documented. The means of assessing a trainee's ability include written examinations, oral questioning and performance demonstrations. A combination of written and oral examinations has been found to be the most appropriate form of demonstrating knowledge and skills. In the assessment of simulator training, predesigned and validated observation forms and checklists should be utilized in

order to increase objectivity. All assessments of simulator training sessions should include an evaluation of the trainees, the feedback given and further measures considered as a result of the evaluation. Assessment should not be regarded as a one-off activity. In some States, reassessment of individuals by instructors and their immediate supervisors is undertaken at regular intervals.

3.2. KNOWLEDGE MANAGEMENT

3.2(a) Good practice: Nuclear Knowledge Transfer and Retention Program.

Description:

The process of knowledge transfer and retention risk assessment is a valuable tool that proactively identifies the key knowledge needs of the organization. This is critical to the safe and reliable operations of the business. There are approximately 80 identified experts (unique knowledge holders) at each Nuclear Power Plant. The Knowledge at risks and Expert at risk statuses are regularly analyzed and updated by Knowledge Managers and Lead Experts.

1. **Knowledge identification and prioritization (knowledge audit)** within each area is identified and captured. This is essential for the successful and safe operation of the units
2. **Assessment criteria are** the uniqueness and specificity of knowledge in terms of the level of risk of loss is the main assessment output. The first priority is to identify, capture and retain critical knowledge held by employee nearing retirement. In the process of completing the Knowledge at risk and the Expert at risk lists the following steps are conducted:
   - Knowledge description
   - Knowledge area (i.e. Maintenance, Chemistry, Operations)
   - Knowledge uniqueness (scale 1-5)
   - Applicability for future (scale 1-5)
   - Knowledge holder (expert's name)
   - Risk of loss (scale 1-5, i.e. due to retirement)
   - Recommended tool for knowledge capture (experience report, debriefing, communities of practice)

3 Key participants in oversight roles

- Board KM Owner
- KM Coordinator
- Knowledge Manager
- Knowledge administrator
- Sponsor
- Lead expert
- Expert

4 Main tools / Benefits

HR Support and Deliverables / Main tools and activities

- Implementation and process improvement
- Plan audit
- Debriefings
- Experience reports
- KT&R plans
- Expert at Risk and Knowledge at Risk lists
- Expert profiles

- Expert meetings
- IT support

Proactive analysis encompassing five year "look ahead" retirement projections

- Prioritization for capturing critical safety knowledge
- Increasing individual engagement in knowledge loss risk management
- Increasing the capability to manage the risks and mitigate the negative impact of critical knowledge loss

Results

- 212 identified experts (unique knowledge holders)
- 121 shared experience reports
- No compliance findings related to lack of qualifications or knowledge loss
- No cases identified where knowledge exited the organization without proper capture of expertise
- KT&R profiles updated annually
- Clearly described responsibilities in the Knowledge Management process
- Robust five year workforce planning forecast process
- Experience report topics included within initial and continuous NPPs' training requirements
- Part of individual Key Performance Indicators and included in the annual evaluation process

3.4. SUCCESSION PLANNING

3.4(1) Issue: There is no policy and no structured review for succession planning process for the NPPs to ensure that there is sufficient "bench" experience ready to enter into key roles in case of attrition.

The team observed following:

- There is no procedure in place that provides guidance or requirements for conducting succession planning process.
- No key performance indicators are in place to measure turnover rates, development plan progress and readiness levels.
- There is no comprehensive senior management review for the NPPs to set expectations, to evaluate progress and recommend adjustments as needed

The absence of a comprehensive review process can impact the overall effectiveness and weaken the rigor of a leadership development process (initiative).

Suggestion: The corporate organization should consider developing a strategic succession planning policy and process for the NPPs to address future attrition needs so that the knowledge level is at or exceeding required levels.

IAEA basis:

SSR-2/2 Safety of Nuclear Power Plants Commissioning and Operation requirements

Requirement 4: Staffing of the operating organization

3.11. The organization, qualifications and number of operating personnel shall be adequate for the safe and reliable operation of the plant in all operational states and in accident conditions. Succession planning shall be an established practice for the operating personnel. The recruitment and selection policy of the operating organization shall be directed at retaining competent personnel to cover all aspects of safe operation. A long term staffing plan aligned to the long term objectives of the operating organization shall be developed in anticipation of the future needs of the operating organization for personnel and skills.

GS-G-3.5

Appendix I

(2) LEADERSHIP FOR SAFETY IS CLEAR

(d)Leadership skills are systematically developed:

—Managers and supervisors should be selected and evaluated with due consideration of their demonstrated ability to foster a strong safety culture.

—Skills in change management should be taught to individuals in leadership roles.

—A succession plan that includes aspects of safety culture should be put in place for developing future managers.

4. COMMUNICATIONS

4.1. INTERNAL COMMUNICATION.

The organizational corporate structure of CEZ follows the model with an executive board of directors and a supervisory board with powers. There are very clear lines of communication delineated and followed in the operating management organization of CEZ.

The Board of Directors' approved Safety and Environmental Protection Policy includes statements regarding maintaining regular communication with stakeholders and the importance of open and effective internal communication. This inclusion in a Board policy is a positive reaffirmation at the highest levels of the organizational commitment to the principles of transparent communications with its employees and the public.

One of the authorities of the Chief Executive Officer (CEO) is to "to manage the activity in the area of external and internal communication, marketing, public affairs." Ownership by the CEO signifies recognition of the importance of communications and stakeholder relations.

Communications Corporate Structure

The head of Communication and Marketing reports directly to the CEO, and this organizational structure ensures and promotes internal and external communications as an integral part of the management team and corporate strategy. The groups under Communications and Marketing are: public relations, media, marketing, internal communications, external relations, and the communication staff at the two nuclear power plants (NPPs). Crisis communications is an integral part of external, NPP and internal communications. There are 71 communications staff members, including the regional communication staff.

CEZ's communications strategy is developed and evaluated annually by senior management, and disseminated to employees through the intranet. The strategy is reviewed with the NPP management, and tailored to the both nuclear facilities' specific needs.

CEZ communication staff are a talented team of former editors, public relations professionals, and television and radio reporters. They have had specialized communications training (with the exception of one who will take it next year) and the communications team will undergo additional training next year.

The head of External and Crisis Communications has been a positive motivating force challenging the communications team to find creative methods to enhance the strategic direction of the communications program.

Manager of internal communications and his group plans targeted campaigns and uses an array of methodical tools for internal marketing of the corporate culture. Two years ago this group was moved out of Human Resources and became part of the CEZ communications team. Throughout CEZ's corporate office there are colourful posters and graphics promoting corporate culture and safety culture. The employees are proud of the positive motivating messages displayed in this vibrant signage.

NPP Communications Staff

Earlier this year, the NPP communications group was removed from the plant management organization and folded into corporate's Communication and Marketing section. The main spokespeople for the nuclear facilities receive technical training in nuclear reactor concepts and in communication skills. There is good interface between the corporate and NPP communication staff, and between the NPP communication staff and the plant site management.

After Fukushima accident, the emergency response group directed the communication staff to improve communications. Both NPP communication staff went to the IAEA International Experts Meeting on communications held in June 2012. Subsequently, they were trained on social media skills with their deputies.

Spokespersons from both NPPs have access to the NPP intranet software, TEDIS, which is used to monitor plant status. This is a positive indicator that CEZ management recognizes the importance of the communication staff as an integral part of the management team. The NPP spokespersons are also on the distribution for the NPP shift engineer's news voice messages. The plant manager and about 20 plant staff have access to this as well. This inclusion of the communication staff into the critical information source ensures the communication staff is aware quickly of any event at the NPPs, and are current and apprised of updated information as it is available.

Internal Communications Improvement Actions

Safety culture surveys have been conducted every three years since 1995 at CEZ. "Communication and Information" was one of the topics in the 2011 Safety Culture and Corporate Culture Survey. 10 470 employees were surveyed. While the results indicated a majority of the employees (55% of respondents) felt that management was giving them information they needed, CEZ commendably used the survey as an evaluative tool, and held focus groups where employees suggested improvements. Action plans were updated and a variety of meetings between management and employees were held to strengthen internal communication and foster cooperative problem solving.

CEZ management has instituted a variety of communication methods to enhance internal communications since the 2011 survey. The communication team was given Key Performance Indicators (KPIs) from the directors of the NPPs, and bonuses were tied to completion. Some of the KPIs included: ensuring large monitors/screens are placed in various locations in the Dukovany nuclear plant for safety messages and current news; updating of the intranet daily; posting an electronic version of the CEZ news magazine on the intranet; and conducting surveys at the NPPs.

NPP Communications Group Efforts

The NPP Communications group displays an ownership of safety culture and has energized the utility's internal communications improvement efforts. There is a staff position for internal communications. The NPP communication staff are an important monitoring and feedback tool for CEZ. They create a number of impressive activities and campaigns jointly with corporate to promote safety messages, teamwork, and feedback. For example, the

campaign "Work Like No One is Watching," included a variety of safety-related prizes such as safety vests and hats.

In addition to the main annual campaign, the communication team implements quarterly ones. The quarterly campaigns are assessed and designed based on current needs. The manager of internal communications at corporate has discussions twice a month with the NPP internal relations staff on any potential emerging issues, and alternates monthly visits to the NPPs to meet with the staff there, and hold a workshop.

Feedback Process

Feedback is received and monitored by in various ways. Some of them are: a feedback form on the intranet; long term surveys (three year ones); short term ones (events arranged by the communication team); and regular meetings— "road shows"—held the second quarter after management goals and strategies are decided and communicated. The suggestion box, (called Orange Box) is placed out during the management "road shows" for employee feedback.

The Orange Box is found at both NPPs for collection of comments and feedback from plant site staff. The NPP communication staff members collect the comments. The NPP spokespeople hold weekly, or every two weeks, meetings with the plant managers, and at that meeting, if there are Orange Box comments, they are discussed. This is a positive demonstration of communication staff being a part of management's team.

While there are a range of periodic employee and management meetings in headquarters and in the field, CEZ's senior management and the communications team recognize the importance of having a communication pathway that links the onsite and offsite employees into the corporate culture, and thus have worked on developing its intranet. The intranet has become a valuable information bridge between corporate and the two nuclear facilities. The feedback form, the "Orange Connection," is where employees can provide comments and suggestions. Topical responses to the employee input are put on the intranet for all employees viewing. CEZ used its experience in business marketing to create the media tool CEZ TV on the intranet. CEZ TV is used not only for increasing communications by recording business events, but also promoting employee relations by recording social events. In addition to TV CEZ on the internal portal, there is an online open safety forum for discussions, a blog devoted to strategy, and employees are able to access corporate policy documents where they can comment on them. This portal is an outstanding tool for information sharing and the management of safety. The team considers this a Good Practice and this is referenced in the Independent Oversight section of the report.

In addition to the intranet site, employees engage in dialogue on CEZ's social network sites, where they often provide input in discussions and serve as adjunct social media monitors.

There are awards and prizes associated with providing feedback on the various activities and campaigns the communications group arranges, and the communication team feel their role in internal communications is to reward feedback.

Summary

The CEZ management structure is efficient and ensures top down communication (management to employee), but as the results of the 2011 Safety Culture survey showed, there were weaknesses in the upward (employee to management) communication. The many recent actions by CEZ management in the last two to three years in response to the results of the 2011 survey, and the on-going campaigns and monitoring, have in the team's view, improved the upward flow of internal communications. The moving of internal communications unit into the Communication and Marketing reporting chain directly responsible to the CEO was a strong statement on CEZ's commitment to enhance internal communication.

4.2 EXTERNAL COMMUNICATION

Website

The information on CEZ's website is comprehensive and contains many good features, such as the *For Media* link at the top, questions and answers on nuclear energy, and interactive educational visuals on how nuclear power plant functions. There is extensive information on the Environmental Impact Assessment process for the proposed completion of the Temelin NPP site and an impressive information availability portal and licensing documents. There are valuable information leaflets on such topics as radiation and nuclear waste in the website's Research and Training section.

Social Media (Social Networks)

CEZ's social media platform includes Facebook, Twitter and Yuo Tube. With its seven impressive different and distinct Facebook groups, active Twitter profile, and many videos inYou Tube, CEZ's presence in the "information superhighway" of the internet is strong and active.

One of CEZ's Facebook's groups is, "Pro jádro" (For Nuclear), which was launched in 2012 for the purpose of explaining the nuclear sector to the public, in particular the youth. In addition, the group is an information source for CEZ's NPP events. This Facebook group was used live in the emergency preparedness exercise held at the Dukovany NPP earlier this year. Six updates were posted on the evolving exercise events. Many positive responses from the public to CEZ's live activation of this social network site for the drill were received.

The other CEZ Facebook groups related to nuclear energy discuss careers, Information Centre activities, and professional discussion exchange. Two of the groups relate to CEZ's corporate sponsorship and support to the community. Other groups discuss electric vehicles and discounts for customers, which would be of interest to the general public. In the professional discussion group, Dukovany NPP's building permit for the construction of towers for cooling of the plant safety systems (along with photos) and a scheduled shutdown of unit one were posted. In both cases good explanations were provided, and there were on-going discussions and questions.

CEZ's Twitter site had a range of current news postings. They were diverse and included: a building permit issued for Dukovany NPP; the Prime Minister's visit to Temelin; 70,000 visitors of the Information Centre on Renewals; and corporate profits.

There are many CEZ videos on You Tube. Some are news clips on NPP activities and Information Centre events. The majority are related to CEZ's sponsorship activities.

CEZ, through its strategic positioning in Social Media, is continuously engaged in providing clear and consistent information to a variety of stakeholders— professional organizations, educational institutions, local communities, sports, businesses—and has active mechanisms for rapid dissemination of information that would be needed in an emergency or crisis. CEZ is building credibility, and has an effective global communication tool with its internet platform. Each communication platform reinforces the other, building a strong foundation of consistent engagement. The team recognizes this as a Good Practice.

Stakeholder Relations

The CEZ CEO meets with the Chairperson of SÚJB frequently very regularly. There is a good professional relationship and common trust between CEZ and its regulator.

CEZ has formal agreements with the municipalities in the Emergency Planning Zone (EPZ) of the Temelin and Dukovany NPPs. One of the provisions in the agreements, for example, would be for CEZ to purchase improved emergency rescue equipment. CEZ also sponsors sports activities and family events in the local communities. Members of Temelin's fire brigade are popular at local events and have proven to be good ambassadors for CEZ.

The Nadace CEZ Foundation enhances CEZ's stakeholder and public communications through its extensive community sponsorship and donor activities. Photos and write-ups on the website www.nadacecez.cez demonstrate an active community presence because of this Foundation's excellent outreach and support.

Because of Dukovany NPP's larger EPZ, CEZ works with closely with the Civic Safety Commission (OBK), an independent body. OBK has become a professional partner to CEZ in assisting in relations with the public through general nuclear energy education and emergency preparedness. OBK is comprised of seven mayors who govern towns in the Dukovany's EPZ teritory.

For the last 10 years, CEZ management has sponsored annual excursions to foreign nuclear facilities for local government representatives, regional authorities, state administration individuals and journalists from both the Temelin and Dukovany NPP regions. These innovative excursions have resulted in positive interfaces amongst the officials, as well as with CEZ management, and provided an opportunity for educational training of journalists in nuclear energy technology. Past excursions have included nuclear facilities in France, China, Russia, Sweden and U.S. Often, this is the first opportunity for the local officials to meet one another and this event promotes opportunities for cooperative relations.

Public Dissemination of Information on NPP Status and Events

As required by national legislation, CEZ sends a daily status report on the Temelin NPP to Austrian federal authorities. In a proactive transparent move, this report is also sent to international, national and local media, and local stakeholders, as well as being published on CEZ's website. Another legal requirement for CEZ regarding the Temelin NPP is to produce periodicals. But the legislation was not specific as to the publishing or dissemination. Again, going beyond what is legally required, CEZ distributes 24,000 copies of the *Temelinky* magazine 8x a year (one per household in the EPZ).

CEZ also produces a magazine for the Dukovany NPP, *Zpravodaj*, and following the principles of openness and transparency, disseminates 40,000 copies of *Zpravodaj* 4x a year to the residents in the Dukovany's EPZ.

The CEZ communication staff are active. In 2012, the CEZ Group conducted 120 press conferences and issued 360 press releases. Specifically related to nuclear, in 2012, they issued 71 press releases and held 19 press conferences.

There were 27,500 articles published about the CEZ Group in 2012.

NPP Communication staff

The two spokespeople of the nuclear plants have worked together on a few projects before becoming centralized in corporate this year. The recent safety campaign ("Work Like No One Is Looking") was a joint campaign and they developed the stress test communications strategy together. Otherwise, there did not seem to be a sharing of successful communication practices, or an effective transferring of strategy between the two members of communication staff. The team recognizes CEZ's centralization actions have made improvements in the management and strategy of communication. However, the two nuclear facilities have differences—such as length of operation, size of emergency planning zone, and design—which has created over time distinct internal and external communication practices and cultures for each site. A communication framework structure that would promote the sharing and transferring of good practices and cross-training of the NPP communication staff is lacking. The team has developed a Suggestion in this area.

Information Centers

In 2012, the Dukovany NPP Information Center had 34,328 visitors and the Temelin NPP Information Center had 34,203 visitors.

NPP Tours

Tours are offered at both the Temelin and Dukovany NPPs. Last year, 2,140 people toured the Dukovany NPP and 6,163 people toured the Temelin NPP.

Special NPP Tours

Tours are offered at both the Temelin and Dukovany NPPs during outages, and CEZ hosted 40 summer university students and 25 journalists last year, along with mayors and other local and regional officials and authorities. These are special excursions which include the reactor hall.

Journalist Training

CEZ first started journalist training ten years ago when the utility invited journalists to the annual excursion program to foreign reactors for the local and regional officials of the two NPPs.

Twice a year, the communications team invites the journalists for topical discussions on nuclear energy as part of their media education program, and during NPP outages, formal training seminars for journalists are held at the nuclear facilities.

Methods to Evaluate Effectiveness of Communication Strategy

The communications team conducts a "Lessons Learned and Feedback" sessions on a regular basis as part measuring the effectiveness of their communications with the media.

CEZ methodically uses surveys as an evaluative tool to monitor the effectiveness of the utility's communication strategy. This excellent approach has resulted in targeted improvement in action plans and more effective communications, both externally and internally. One of the staff members of the Survey Group is a sociologist and he uses his expertise to ensure the surveys and polls are effectively supporting CEZ's communications

strategy. CEZ has been conducting annual public opinion surveys on nuclear energy since 1994, and its Survey Group works with outside agency specialists to conduct these national and regional polls on nuclear energy, as well as specific topical surveys in more localized areas. The same evaluative survey tools are used on a regular basis for both corporate and NPP internal communication activities. After internal communications campaigns, employees are surveyed, and this feedback is used for future improvements. Participating students and teachers are surveyed in the education program regularly for effectiveness monitoring.

Education Program

The education program was one of the first outreach programs established by CEZ and is an extremely active and successful one. "The World of Energy Club" for teachers has 548 members who share educational information and curriculum. Over 4,500 workshops have been conducted for more than 160,000 students. CEZ sponsors debates for youth between ages 14-18, and subsequently surveys the participants as part of an effectiveness evaluation. Most noteworthy, CEZ recently published as part of the education program, a *Nuclear Encyclopedia in English.* An important element of this program is the availability of NPP student internships and tours for both students and faculty. The team recognizes this as a Good Practice.

Transparency

ČEZ routinely disseminates information. This approach has resulted in transparency of information related to its nuclear facilities. CEZ makes information available not only globally through its internet platform and locally through its active community presence, but also through newsletters, daily email notifications, plant tours and media relations. CEZ has been effective in communicating information that is consistent and clear.

4.3 CRISIS COMMUNICATION

Plan Updated

The CEZ crisis communication plan was extensively updated after the Fukushima accident. The current plan designates a press person at the plant, a press person in the regional Information Center, and a press person with the CEZ Crisis Board in Prague (headquarters). These streamlined communication pathways provide CEZ, the responsible entity, management of the event messages to ensure consistent and accurate information.

Memorandums of Understanding

In CEZ's memorandums of understanding with the local and regional response organizations (police, fire and medical), the appropriate communication pathways are designated.

Communications Training

Specialized communications training has taken place for the potential crisis communication spokespersons. The CEZ Crisis Board members are the CEO and Directors, and they all have had communications training. The Temelin NPP manager had communications training in 2012 and the newly appointed Dukovany NPP manager will be trained in 2014.

Staffing

CEZ management has assessed potential staff persons who could serve as extra communications support, such as the NPP Information Centre tour guides, as well as technical employees at the plants. A list of nuclear experts has been developed of outside experts who can support media interviews and assist as information disseminators. This list is updated quarterly.

Emergency Preparedness Exercises

In 2013, CEZ had eight emergency drills at Dukovany NPP and ten at the Temelin NPP. In the last three years, they have had four drills (with the exception of one year where they had five at Dukovany NPP) at each plant every year. The reason the NPPs conducted four exercises was to ensure a practice session for each shift. Journalists were included in these exercises for the benefit of their education and for realism of the scenario.

Social Media: Crisis Communication Tool

In March, the communications team successfully tested their "social media website." Based on this experience, CEZ developed "dark website," and created dark social page "Jaderná událost" (a nuclear accident) for use in emergency. It will link to one of the utility's Facebook pages. Commendably, mobile applications have been prepared, as well as remote access rights for various key staff.

The practice event communication messages posted by CEZ on the "dark website" and Facebook pages would also be placed on CEZ's Twitter profile. Frequently Asked Questions have been developed and the communications team plans to develop pre-planned key messages. After a recent practice exercise, the communications team confirmed a dedicated person was needed to handle social media and the website. The emergency exercise practice results are reviewed by a committee every two to three months.

COMMUNICATIONS DETAILED FINDINGS

4.2 EXTERNAL COMMUNICATIONS

4.2(a) Good Practice: Social Media

Description:

CEZ has an impressive seven Facebook pages, three of which have some relationship to nuclear energy. CEZ also has a Twitter profile and many videos on YouTube.

One of the Facebook pages is, "Pro jádro" (For Nuclear). It was launched in 2012. The purpose of the group is to explain the nuclear sector to the public, in particular to young people. In addition, the group discusses the news concerning ČEZ's nuclear power plants. This Facebook page was the principal communication channel of the "ZÓNA 2013" (zone) emergency preparedness exercise held at the Dukovany NPP. Since its launching, "Pro jádro" has acquired more than 16,000 fans.

The Twitter profile has a variety of announcements posted, similar to the Facebook ones, reflecting that an obviously diverse audience follows it.

Advantages:

1. The sites provide CEZ active mechanisms for rapid dissemination of information that would be needed in an emergency or crisis.
2. The targeted Facebook pages allow CEZ to be continuously engaged in providing clear and consistent information to a variety of stakeholders.
3. CEZ, through its Social Media strategy, is transparent, building credibility and has an effective global communication tool with its internet platform.

4.2(b) Good Practice: Education Program

Description:

CEZ's education program, *World of Energy*, was awarded a prize by the European Nuclear Society in 2012. Eighty-five per cent of the participating teachers in CEZ's education program when surveyed said that knowledge of students about energy has improved after they became familiar with the materials of ČEZ educational program.

Advantages:

1. The program offers internships and opportunities for students and faculty to tour Temelin and Dukovany NPPs.
2. The "World of Energy Club" for teachers has over 500 members who share educational information and curriculum.
3. Various competitions via social networks (Facebook) are organized to reach out to youth.
4. The ČEZ approach of using the latest survey techniques as an evaluative tool for the utility's communication strategy is used to survey participating students and teachers in the education program regularly for effectiveness monitoring.

4.2 (1) Issue: There is a lack of sharing of good practices between both NPP sites and cross-training of the NPP site communication staff.

The team made the following observations:

- In the reorganization in 2013, the communication staff of Temelin NPP and Dukovany NPP became part of corporate. They were moved into the Communication and Marketing section which reports directly to the CEO. The NPPs communication staff report to the head of External Relations and Crisis Communications. While the team observed teamwork and positive interactions between the two spokespersons of the NPPs, there was a lack of a cohesive communication strategy approach.
- CEZ is planning an expansion for Temelin, whereas Dukovany is undergoing projects related to long term operation. These two major and dissimilar projects not only require specialized technical work processes, but also unique communication campaigns.
- The team recognizes that there are good communication practices at the NPP sites, but notes that they are not being effectively transferred between the two.
- The differences between the two facilities are significant enough that if there was a crisis event at the Temelin NPP, and the Dukovany communicator was called upon for support at that site, he or she would hindered by lack of knowledge on plant specifics, and would not be as effective as would be needed in an event. This would be true also of the Temelin communicator at the Dukovany NPP. While the CEZ NPP communication staff are highly trained in nuclear technology and communication skills, communicating effectively also requires awareness of the specifics of the plant design, region, and local press.

Suggestion: The corporate organization should consider the sharing of good practices between both NPP sites and cross-training of the NPP sites communication staff.

IAEA Basis:

GS-R-3

3.2. Senior management shall develop individual values, institutional values and behavioural expectations for the organization to support the implementation of the management system and shall act as role models in the promulgation of these values and expectations.

3.3. Management at all levels shall communicate to individuals the need to adopt these individual values, institutional values and behavioural expectations as well as to comply with the requirements of the management system.

GS-G-3.1

5.52. A specific management process should, on an on-going basis, provide a vehicle for establishing priorities, including priorities for new work, and excluding lower priority activities. This process should also integrate all review and oversight activities by

management, to ensure that there is a structured approach to decision making that meets the needs of the business plan.

5.53. In determining to what extent a process should be documented, the organization should consider factors including the following:

- The effects of the process on safety, health, environmental, security, quality and economic elements;
- Statutory and regulatory requirements;
- The satisfaction of interested parties;
- Economic risk;
- Effectiveness and efficiency within the organization;
- The competence levels of individuals;
- The need to retain process knowledge;
- The complexity of processes.

5.55. Processes developed using a top-down approach should be hierarchically linked and should be more detailed the closer they are to the technical or task level. At the technical level the process may be better described in a procedure or instruction. The operational framework within an organization is typically made up of a number of processes, most of which have interfaces across the organization. Some organizations have found it beneficial to structure their processes as follows:

- Core processes, the output of which is critical to the success of the facility or activity;
- Supporting processes, which provide the infrastructure necessary for the core processes (e.g. procurement training);
- Management processes, which ensure the operation of the entire management system.

GS-R-3

5.5. For each process a designated individual shall be given the authority and responsibility for:

- Developing and documenting the process and maintaining the necessary supporting documentation;
- Ensuring that there is effective interaction between interfacing processes;
- Ensuring that process documentation is consistent with any existing documents;
- Ensuring that the records required to demonstrate that the process results have been achieved are specified in the process documentation;

NS-G-2.4

8.1. Management of the operating organization at all levels should encourage and cultivate effective communication. Downward communication should provide assurance that management’s direction and expectations are understood; upward communication should help encourage the identification of problems directly to management; horizontal communication should support effective work co-ordination and collaboration.

5. MAINTENANCE

5.1. ORGANIZATION AND FUNCTIONS

The Production Division has the responsibility for power generation and safe operation of both Dukovany and Temelin NPPs.

The organizational structure of the Production Division is clearly defined and the following entities are involved in maintenance activities at different stages of initiation, planning, preparation, implementation and subsequent records storage and utilization:

- Asset Management Section;
- Supply System Management Section; and
- Dukovany & Temelin Nuclear Power Plants.

Both the Safety Section and Procurement Division provide assistance in assigning safety priorities and ensuring necessary material resources.

Policies and Responsibilities

In the Production Division, nuclear policies (Nuclear Safety and Environment Protection) are clearly stated in formal documents and advertised. Maintenance strategy is written in a format of a guidance document named CEZ_SM_0131 rev.4 "Asset Management." This guideline describes basic processes, activities and responsibilities in the management area of assets management to achieve the following goals:

- Assessment of performance and condition of assets for the purpose of determining an optimal strategy to achieve the required level of performance and safety;
- Optimization of the assets management scope and effective planning; and
- Implementation of effective maintenance to achieve the required level of performance, safety and service life.

The Production Division is encouraged to ensure that the maintenance strategy is clearly stated in a formal document and is advertised in Asset Management, Supply System Management Sections and in the NPP Maintenance Sections.

Responsibilities at the Corporate level (Asset Management and Supply System Management Sections) are to develop a common vision and concept of assets management for the NPPs Sites (Nuclear Power Plant) in terms of midterm assignments for a ten year period and annual assignments having permanent feedback from the NPPs Sites. Safety requirement, standards and rules are issued also at the Corporate level which acts as a guarantor.

The responsibility to implement midterm and annual assignments relies on plant organizations, and the plant manager being held responsible.

Based on annual assignments, the NPP Site, using standards and rules from Corporate level, is producing the maintenance annual plan, plant manager and further the maintenance manager being responsible for its implementation.

Responsibilities and authorities of Nuclear Power Plants and other Corporate Sections are defined in the document V05 named "Production Asset Management," which is revised annually.

The flow-chart of the process V05 presents step-by-step the connection of all sub-processes, which take part for final output. For the visualization of this flow-chart, the software tool called ARIS is used to describe in illustrative mode the relationship between individual sub-

processes. It also details the responsibilities, inputs and outputs of the individual process components.

A well-documented contract between the Production Division and Nuclear Power Plant (NPP) Manager is in place for one year duration and covers the responsibilities and obligations of both parties to fulfil the yearly assignments. Every quarter, an evaluation of the execution of this contract is conducted with the focus on performance indicators realization.

A discussion with one of deputy plant managers clearly revealed the understanding and effectiveness of the interfaces between the plants and corporate organization. It has been confirmed that corporate level sets-up policies, standards and rules which are acknowledged and implemented by the plant management in the business process of the plant, including the maintenance area. It was also mentioned that there is a strong commitment at the Corporate level to give appropriate attention on safety and safety-related issues, including allocation of supplementary financial resources to solve them.

Performance indicators

To measure the achievement of the annual goals, the following performance indicators are established for maintenance at the Corporate level, most of them being included in long term maintenance contracts.

For illustration, some performance indicators are presented below:

- Equipment availability;
- Performance of repairs in specified and agreed time;
- Observation of planned outage time-schedule;
- Number of complains (reworks);
- Number of violation of ČEZ regulations;
- Number of violation of technical specifications; and
- Unplanned reactor trips.

Feedback and Operating Experience Utilization

On regular basis, asset management personnel visit the power plants (most of them are former plant personnel) and collect feedback from the realization of maintenance programs.

On quarterly basis, the Asset Management Section organizes a meeting to analyze and discuss the following topics: status of realization of maintenance program;, status of implementation of safety improvements;, commercial modifications and safety related investments;, different aspects of relationship with main contractors and suppliers (quality of materials and spare parts, availability of tools);, budget execution;, possible revision of the yearly maintenance plan; and, scope of outages for the next year.

It is worthy to mention that the first topic on the agenda of this meeting is always dedicated to safety, safety issues or concerns. Normally, the budget for the annual maintenance plan covers maintenance activities (preventive and corrective) identified before contracting (based on maintenance program). During performance of work, both contractors and the NPPs identify additional failures or lack of equipment performance, which, if not addressed, can increase the risk and jeopardize the availability of equipment.

Usually, this meeting is the forum where a decision is made to allocate additional resources (finance) to fix these deficiencies, thus reducing the risks when plant manager’s finance reserve is not sufficient to cover it.

The information coming from NPPs operational experience is discussed and the Asset Management Section decides actions to be taken to mitigate the deficiencies. Some examples are given below:

- Request from power plant to introduce in the maintenance plan additional activities (in the middle of the year) due to newly installed equipment in the radiation protection (installed in July 2013).
- During installation of new component (overhaul of electrical generator) at the power plant, there was a request from the NPP to perform additional audit on that Supplier to check its capability to perform installation and commissioning of the equipment.

Asset Management and Supply System Management Sections are staffed with sufficient number of adequate and professional personnel, mostly coming from nuclear industry, particularly from NPPs. This situation makes the relationship with NPPs easy and efficient.

Maintenance policy documents are being reviewed at least every three years, to incorporate latest recommendations from audits performed by qualified and experienced personnel from outside of Asset Management and Supply System Management Sections.

5.2. MAINTENANCE PROGRAMS

To ensure safety and reliability of production, a structured approach is used to maintain equipment according to its importance, in terms of impact of its potential failure on the safety and reliability of production. Segmentation of equipment into logical complexes and also categorization of equipment according to its criticality, facilitate the implementation of maintenance programs and make it more efficient.

Technological equipment is divided into three categories of importance according to ČEZ document ČEZ_ME_0608. It starts with the highest importance for safety, continue with equipment whose function is non-critical for operational safety and ends with lowest importance (run to failure).

Maintenance programs consist of maintenance interventions arising from requirements of regulatory authorities, good practices from the industry and for equipment of category 1&2 also from reliability requirements. These are annually evaluated and adjusted, if necessary, for optimization.

As a feedback from the implementation of maintenance programs, the NPPs facilitate the connection with their work management system (specialized software Asset-Suite 06), to provide the Corporate level with enough information about the status of the assets and their performance in order to decide future actions which should be considered.

The effectiveness of the maintenance program is measured using a systematic assessment of the condition of the assets at the NPP (systems & equipment) in "Health Reports." Their purpose is to collect data and obtain feedback on the current performance and condition of the systems and their equipment and components and subsequently on the efficiency of the equipment maintenance programs, detecting negative trend in the performance in the course of time.

Results of the assessment are being used to implement right measures for correcting deficiencies in performance. The outputs from the Health Reports serve as a basis to produce the Power Plant Condition Report. For safety and safety related systems and equipment, the reports are reviewed by the System Health Committee which comprises members from the both Plants and Corporate level.

Preventive maintenance program

Preventive maintenance program is implemented for equipment of categories 1 and 2 and is selected with pre-determined cycles or according to the technical condition. The preventive maintenance plan and its updates are driven by manufacturer recommendations, international good practices, operation inspection and test programs or by suitable diagnostic methods used for detection of technical condition or predictions based on monitoring degrading mechanism.

The preventive maintenance plan for the relevant year as a part of annual maintenance plan is generated at the Site level by the Asset-Suite 06 application.

Predictive maintenance techniques

For safety or safety related equipment like reactor vessels, steam generators, reactor coolant pumps, turbo generators etc. special predictive techniques are used to proactively detect defects or weaknesses in performance. Oil analysis, thermo-graphic monitoring, vibration monitoring and refractometry tests are some of the predictive maintenance techniques used at NPP sites, aligned with current industry good practices. All predictive maintenance activities are performed by plant personnel who are highly qualified in specialized laboratories, and the results are evaluated promptly, appropriate measures being applied if necessary, by modifying maintenance programs.

Corrective maintenance program

Corrective maintenance is performed in order to remove failures discovered from surveillance program, inspection or testing programs. The priorities for the removal of failures are established at the NPP level by the system component engineers or shift engineers. The effectiveness of corrective maintenance is evaluated together with the whole maintenance program.

Lifetime management program (ageing management)

The concept of Lifetime management (Life cycle management) is applied to category 1 of the equipment, basically to the reactor components, which has no failures tolerance.

The Asset Management Section has prepared a special document which defines the list of such equipment in the specific plant. Central Engineering Section has been preparing a technical specification on the degradation mechanism and the methods for evaluation for each piece of equipment from the above mentioned list. To make sure that the methods for evaluation are aligned with international practices, an IAEA SALTO mission has been requested for 2014 to confirm the readiness of Dukovany NPP for the LTO (Long Term Operation) beyond the year 2015.

This mission will help the Asset Management Section to decide about the life extension of Dukovany NPP.

Risk Assessment

The Power Plant Condition Report prepared by the NPP in cooperation with the Central Engineering Section, presenting a summary of substantial technological risk in the perspective of next ten years, is used by both NPPs and Corporate Sections to solve identified problems and allocate appropriate funds to remove the risks. The method of risk evaluation is set by Corporate document CEZ_ME_0731. As a conclusion of the Plant Condition Report, a Risk Register is produced, which evaluates the main equipment of the plant (about 100) proposing also measures to control or eliminate the risk. It contains also commitments from responsible group with dates and solution for corrective actions to be implemented. The report is updated once a year and discussed with the Asset Management Section. Solution for elimination or control of risk could take the form of maintenance actions or investment actions.

In order to keep maintenance programs and practices current with industry practices a benchmark meeting has been organized with Slovak NPPs and EPRI experts to look for the alignment with INPO guideline for maintenance AP913.

Examples of a few topics from the agenda of the meeting are the following:

- Maintenance of diesel generators operated in stand-by mode;
- Predictive maintenance technique for pumps, fans and reciprocating compressors;
- Optimization of valve maintenance program;
- Reactor containment periodic pressure test evaluation; and
- Component reliability assessment according to the INPO standard AP913.

5.3. MAINTENANCE PLANNING

Maintenance planning is prepared by each NPP based on corporate procedure CEZ_PP_0331, having a yearly scope and a look ahead for the next five years in accordance with the business plan.

The annual Maintenance Plan consists of all generated work orders of preventive maintenance, including In-Service Inspection and periodic tests activities, corrective maintenance and planned modifications.

The annual Maintenance Plan is being reviewed at the Corporate level and actions with resources requested by plant manager to solve prioritized safety issues are accepted and supported by enough financial resources. Special attention is given to regulatory requirements, safety improvements resulting from stress tests reports, actions closing gaps between best practices in the industry and the situations in the power plants.

During the review of Maintenance Plan, the KPV software is used by both NPP and Corporate levels as a tool and platform for dialog and adjustments of maintenance plan together with associated financial resources, according to the reality in the particular NPP.

The team considers this initiative a Good Practice.

Short term plans (monthly, outage and daily) are being elaborated based on specific processes (V03, V06, V07, V08).

The execution of the maintenance plan is done at each NPP Site under the responsibility and control of plant management, using dedicated contractors, according to the plant procedures, rules and regulations.

5.4. CONTRACTOR STRATEGY AND PRINCIPLES

Since 1990's ČEZ personnel has not performed any "hands-on" maintenance activities and starting from 2007, neither preparatory activities to perform the maintenance. At the present time, these activities are performed by specialized dedicated contractors.

There are long-term (five to eight year duration) contracts called "Master Agreements,," negotiated as frame contracts at the Corporate level, dedicated to logical complexes mainly covering nuclear island, conventional part, Electrical and I&C systems, etc.

The main principles of these long-term contracts are clearly defined, and they refer mainly to long-term original equipment manufacturer (OEM) support, Supplier qualification, full logical complex maintenance service and responsibility for quality, safety, schedule and equipment reliability performance and transparent cost evaluation. This expectation from the Corporate level is transferred into performance indicators, which are mandatory for the contractors.

The contractor management principles are clearly stated in ČEZ_PP_0365 – "Supplier System Management."

The scope of these contracts is to cover preventive and corrective maintenance including consumable materials (safety and safety-related spare parts are delivered by ČEZ), maintenance management, technical support (on site front-office and supplier's head-quarters back-office).

In order to perform the work, ČEZ provides contractors access to available plant documentation, operational and wiring diagrams, results of diagnostic tests, test equipment programs, test protocols etc. ČEZ also provides to the contractors all necessary training, computer facilities and access to IT systems needed for maintenance management under the contract as well as necessary equipment, devices and special tools for maintenance. The contractor is also part of the ČEZ team responsible for investigation of equipment failures and implementation of corrective actions.

In terms of liability, ČEZ is liable for safety operation of the NPPs in front of state authorities and the contractors are responsible and accountable to ČEZ for observing all requirements and conditions negotiated in the contracts.

Under the valid Master Agreement which are negotiated every year at the plant level with Corporate level support, "Contracts for work," specific for each NPP and logical complex and cover the execution of the maintenance plans.

The "Contracts for work" are negotiated using Technical-Economical specification (TES), which is the basis for ČEZ requirements. The typical structure of TES consists of equipment specification, maintenance programs and plans, corrective maintenance history, history of significant modifications and response time requirements. The content of TES is described in ČEZ document ČEZ_ME_0744 "Technical and economical specification."

The procedure used by contractors to perform the maintenance work are approved by plants specialist just to make sure that performance and technical standards are equivalent to those of the plant.

To encourage the quality of human performance a Memorandum of Understanding has been signed between ČEZ management and main Contractors management with the main purpose to express the contractors' strong commitment to implement in their organizations the

WANO (World Association of Nuclear Operators) document GL-2002-02 "Principles for reaching excellent results in the area of human performance" provisions.

Dedicated specialists in human performance are assigned to each NPP by the contractors, to reinforce the human performance principles and techniques to Contractor's personnel, when performing the maintenance activities.

Contractor's qualification

According to the Decree No 132/2008, issued by SÚJB having as a basis the Atomic Act, all contractors supplying safety related goods and services must be qualified. The compliance with the above Decree provisions is verified by the customer through audits.

The responsible Section in ČEZ Production Division to perform qualification activities of the contractors is the Supply System Management Section.

Customer audits are performed by the Section in the Supply System Management Section, named Supplier Qualification and Assessment, staffed with seven qualified auditors certified by a national professional Organization called "Society for Quality."

Qualified Contractors are included into the List of Qualified Suppliers (at the present date more than 150), that List being part of ČEZ Quality Assurance Manual approved by Nuclear Regulatory Authority.

Well defined processes, V04.02 and V04.03, are owned (guaranteed) by the Supplier Qualification and Assessment Section Manager, describing the qualification and evaluation of contractors (V04.02) using the procedure ČEZ_PP_0362 and the process customer audit (V04.03) using the procedure ČEZ_PP_0111.

The ČEZ methodology ČEZ_ME_0747 requests that the Procurement Division must procure safety related items and services only from suppliers included in the List of Qualified Suppliers.

Qualified suppliers are continuously evaluated and periodically audited in order to maintain their qualification. The maintenance contracts for the NPP's logical complexes request also the qualification by the customer of the contractor sub-supplier chain. All sub-suppliers are qualified by ČEZ.

The list of qualified suppliers and sub-suppliers is maintained in a database in AUDIS 2010.

Only in case of emergency, the procurement could be done from a supplier not included in List of Qualified Suppliers, but this is accepted only under special, so called "Quality Supervision" described in the same ČEZ methodology ČEZ_ME_0747.

Customer's audits

Supplier Qualification and Assessment Section performs audits using ČEZ methodology ČEZ_ME_0948, which is based on international standard EN ISO 19011.

The outcome of the process is the written Qualification Certificate, which allows the supplier to be included in the List of Qualified Suppliers.

Audits are usually requested by Procurement Division. Based on their requests and the valid duration of the existing qualification certificates, an annual audit plan is issued and approved.

In case of negative findings, corrective actions are requested by the audit team, in certain timing. Only after implementation of corrective actions ČEZ would issue qualification certificate valid from one to three years.

During the audits, any deficiencies in purchase orders issued by ČEZ, identified by auditors or reported by the supplier, are collected and provided as a feedback for management review and resolution. The AUDIS database stores all relevant information and records on customer´s audits, like: audit requirements, audit annual plan, List of Qualified Suppliers, List of findings as a feedback to ČEZ for management review.

Since 2011 ČEZ carries out common audits together with main maintenance suppliers (Škoda JS, Doosan Škoda Power, I&C Energo etc.) into the sub-suppliers organizations, in order to qualify them to be able to perform maintenance work in NPPs. These common audits are supported by senior management of ČEZ. The auditors of main suppliers, together with ČEZ auditors, are trained each year in so-called "Calibration Meetings of Auditors," a special training program conducted by ČEZ.

The team considers this initiative as a Good Performance.

Contractor's evaluation

Contractor's evaluation is a continuous process (V04.02 – Assessment and Qualification of Suppliers), owned by Supplier Qualification and Assessment Section manager, and is described in ČEZ procedure ČEZ_PP_0362. The evaluation is carried out systematically and annually, based on predefined criteria provided by different sections. Examples of these criteria are given below: nuclear safety, radiation protection, fire protection, environmental impact etc. The outcome of the evaluation process of suppliers is entered into the same database AUDIS 2010, which is accessible by all Sections in ČEZ.

Based on this evaluation, suppliers are classified in three categories, which are discriminated by the degree, in percentage of the fulfilment of the established criteria. Category A stands for > 90%, meaning Good without reservation, B between 75% and 90%, meaning Acceptable without indicated risk, and C < 75%, meaning unacceptable. For the improvement of performance, the ČEZ procedure ČEZ_PP_0362 indicates different types of actions, which have to be taken by different Sections, like for example: warning letter to company management, modification of the validity of the qualification certificate, meetings to discuss with the Supplier management the assessment results and conducting extra audits etc.

5.5. CONDUCT OF MAINTENANCE WORK

All annual maintenance activities, preventive, corrective, inspection, testing and outages are performed by contractor or its subcontractor personnel, appropriately qualified to perform the work, under the control of plant management.

It is the ČEZ Corporate level responsibility, to make sure that in the Master Agreement and in the Contracts for Work include clear requirements for the contractor to provide qualified personnel for performance of maintenance work in the nuclear power plants. There is a detailed Appendix to these contracts, which details the qualification of maintenance suppliers and sub-suppliers personnel by disciplines. The suppliers' workers, which perform work in NPPs, have to be qualified basically to cover the following requirements:

- National legislation requirements (industrial safety, fire protection, labour health and safety);
- Specific plant layout and radiological condition, nuclear safety culture, conduct of work in the specific NPP, emergency preparedness, work control procedures; and
- Skills and professional experience (electrical, NDE, welding, rigging qualification, etc.).

During the evaluation of bids, contractors are required to provide written documents attesting the qualification of supply chain personnel.

It is the nuclear plant responsibility to make sure that the contractor personnel, involved in safety related activities are competent, qualified, and fit to perform the assigned work orders, and such responsibility is performed by plant specialist, checking the composition of working groups before they start the planned work, based on specific ČEZ procedure ČEZ_ME_0107.

There is a project in place, initiated following a WANO mission recommendation, to implement the Asset-suite 06 Personnel Qualification Database (PQD) module. This module is part of the centralized information system, and stores the information about each person's qualification, competence, skills, experience, and training, which would be accessed by NPP specialists to check the working group contractors' personnel abilities to perform the assigned work. The target date for the implementation is estimated for the end of 2014. At the present time, all this is done based on existing procedures using manually written documents.

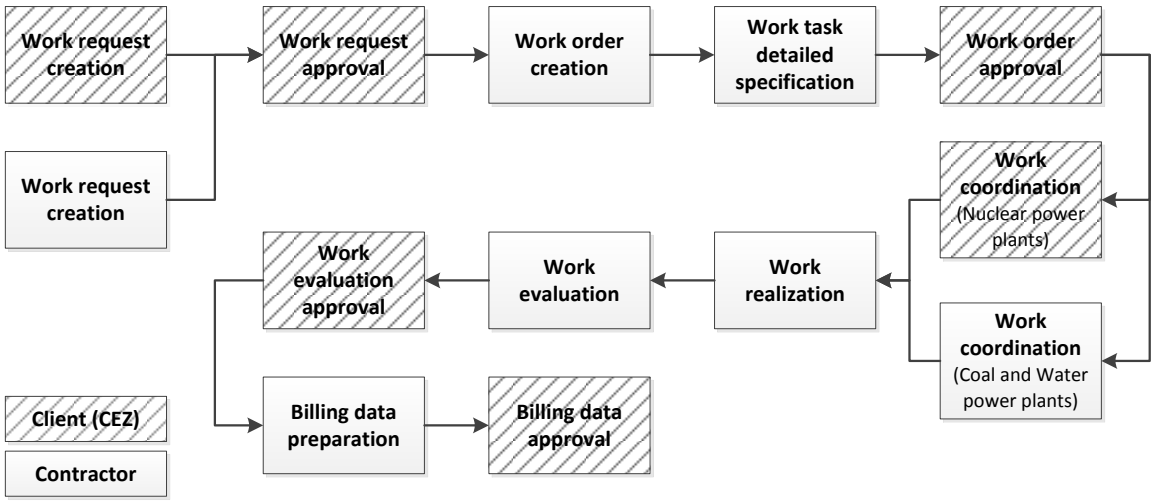
The Supplier System Management Section is encouraged to provide adequate resources at the plant and corporate levels to make that sure the project will be completed within the estimated schedule.

To ensure that the contractors' workers and maintenance supervisory plant personnel maintain the ability to perform and control the maintenance work, training programs conducted by Training Centre and plants' specialists are periodically organized to refresh knowledge, especially for personnel involved in I&C activities on safety or safety related systems or to reinforce good practices and appropriate professional behaviour, for personnel working in nuclear power plants.

Maintenance work management

The maintenance work management is performed by both the maintenance contractors and the NPP, but the process is divided into clear steps which are executed just by only one party with clear responsibilities.

Basic work management workflow:



It can be clearly seen that the interface with operation, the scope of work orders and the evaluation of the completed work is authorized, controlled and approved by the plant specialists.

The records from NPPs show that, in the last three years there were not any technical specification violations caused by maintenance and the number of reworks decreased from 17

to one and the availability of the main safety or safety related systems were maintained into expected targets.

Continuous feedback of the maintenance work results is done by a well-organized reporting system as the main feedback tool to present the way in which the planned work has been performed, and discovered problems and their resolution. Periodic reports (monthly, annually) are prepared and approved by both contractor and NPP, underlining the results of the work, status of performance indicators, proposed measures for improvements and financial status of the contracts.

The effectiveness of the annual contract execution is measured through the degree of fulfilment of the contract performance indicators provided in the Master Agreement and Contracts for Work.

5.6. SPARE PARTS AND MATERIALS

The ČEZ policy document ČEZ_ME_0626 "Specification for requesting items" underlines clearly the responsibilities for procurement of spare parts, including those necessary for safety and safety-related equipment. It is the plant's responsibility to identify and initiate requests for spare parts and materials, which are not in the scope of maintenance contracts. Also the plant component engineers are responsible to issue technical specifications and quality assurance requirements necessary for the spare parts and materials. Spare parts necessary for safety related systems are procured by ČEZ only from qualified suppliers and are made available in the warehouse for the contractors to be used in the maintenance work.

All purchasing activities are performed by Procurement Division based on specific ČEZ procedures.

The only role and responsibility of the Supply System Management Section in the Production Division is to qualify suppliers and maintain the List of Qualified Suppliers for Procurement Division as a result of contractors evaluation and periodic audits.

Once the spare parts and materials are procured, it is the Procurement Division's responsibility to store and properly handle them in the warehouses, located at each site.

5.7. OUTAGE MANAGEMENT

The annual planned outage duration, timing and scope is established as a result of negotiation between Production Management Section within Production Division and the particular NPP. Once this is done, both the Asset Management Section and the plant are responsible for including the outage into the annual assignments for the plant, and also for including all outage activities into the annual maintenance contract for the plant. The plant is also responsible to make sure that all necessary activities will be performed in a properly manner by the contractors.

DETAILED MAINTENANCE FINDINGS

5.3. MAINTENANCE PLANNING

5.3(a) **Good Practice:** KPV software for optimization of maintenance.

For planning, evaluation, review and optimization, of maintenance plans and programs realization, CEZ uses a KPV tool. KPV is a software superstructure over Asset Suite 06 used for fast and comprehensive overviews on the status of implementation of maintenance programs and plans.

All parties involved in the maintenance process (Asset Management Section, Supply System Management Section, Plant Maintenance Section and maintenance Contractors) use the KPV as a flexible and friendly tool, supporting the performance of their particular roles in the maintenance process.

For all users, the KPV tool is accessible via the web interface and therefore, hardware and software requirements do not limit its extensive use.

Benefits/Result:

- Stores maintenance programs of all power plants in the Production Division;
- Archives individual annual maintenance plans;
- Unifies the process of annual maintenance plan preparation;
- Provides different types of reports on the Corporate and NPP levels based on Asset Suite 06 data;
- Serves for benchmarking of maintenance programs between Power plants, for compiling annual maintenance plan;
- Serves for creating inquiries for maintenance contractors and also helps Contractors in compiling their bids;
- Enables checking the degree of fulfilment of the activities contracted based the yearly plan (scope, time, costs);
- Serves the contractor to document the performed activities and the NPP staff, and the Corporate level staff to check the performed activities;
- Serves also for prediction of costs for preventive maintenance for the upcoming annual maintenance plans;
- Allows the users to limit the number of mistakes when processing large amounts of data.

Due to the intensive use of KPV and unified maintenance practices, the preventive maintenance costs has been reduced by 10% at Dukovany and Temelin plants in a period between 2010 and 2013. There is a continuous ascending trend of a success rate in paring between maintenance plans and the status of their execution in any moment in time. In the last three years, the number of mistakes, when processing more than 50,000 maintenance records, has been reduced by 15%.

6. TECHNICAL SUPPORT

6.1 ORGANIZATION AND FUNCTIONS

FUNCTIONS AND RESPONSIBILITIES

The corporate technical support function is implemented at CEZ a. s. through a clear organizational structure that covers both nuclear and conventional plants. The organizational structure provides sections for engineering activities, implementation of modification and projects, technical support, monitoring and control of implementation. It also includes technical groups for technical inspections and diagnostic of NPP systems and components and plant life time management at the lower levels. The organizational structure is sufficiently staffed with respective qualified personnel. Roles and responsibilities of the sections and personnel are described in respective administrative and working documents and job descriptions. The central engineering sections are well managed by the head of Central Engineering via regular coordination meetings at the CEZ a. s. headquarters.

6.2 CORPORATE PLANT MODIFICATION PROCESS

GENERAL OVERVIEW

The Corporate Engineering Section is an owner of the plant modification process. The process has been designed and implemented at in CEZ since the in the year 2006. The process is common for several types of activities such as equipment modifications, purchase of new equipment and tools, design configuration control, etc. All the modifications that affect plant's design are managed by the personnel of Engineering Section. The personnel of Engineering Section possess all the necessary competencies and experience to conduct such activities throughout the process. The management of the Engineering Section provides regular training and coaches the technical personnel. The personnel of the engineering section are mostly former employees of power plants, and are located on sites and work in close cooperation with the NPP staff. The Engineering Section works in the environment of the CEZ management system and has in place all the necessary administrative documents, post profiles, guidelines and procedures to perform their duties and retain responsibilities.

Any employee of the CEZ can initiate a modification through the company wide unified software called TIPOM. The modification process provides a number of steps such as:

- Request for modification or project;
- Project intent;
- Project submission;
- Contract arrangements;
- Project implementation; and
- Project evaluation

A comprehensive evaluation of a modification or a project is conducted by authorized technical personnel of Engineering Section and Safety Section, if necessary, during the course plant modification process. The scope of an evaluation includes safety implications analysis, analysis on the impact on nuclear installation design basis, control of configuration of plants systems and components. The Engineering Section makes judgments and conclusions, stipulates requirement for the engineering and design of a modification or a project. The Engineering Section monitors and controls execution of a modification or a project during an implementation stage, and then makes tests and evaluations to confirm design basis integrity. The Engineering Section maintains contacts with design and engineering organization and

provides procedures for licensing of modifications and projects with SÚJB. In doing so the engineering section fulfils a function of a CEZ a. s. Design Authority. In case of a lack of expertise and /or competencies in certain areas, the Engineering Section makes application for substantiation of design basis features to the original designer of a reactor installation. Such cooperation with the principal designer is managed via contractual arrangements and ensures that design characteristics of the reactor installation are maintained.

Control of temporary modifications

The corporate Central Engineering Section is responsible for establishing and implementing rules to manage temporary modifications (TMs) to systems and components at the CEZ a. s. nuclear power plants, and handle safety related TMs. The OSART Missions at Dukovany and Temelin NPPs have made suggestion and recommendations in the area of temporary modifications management respectively. ČEZ a. s. has undertaken an action plan to resolve the issues identified during OSART Mission. However, there is high number of temporary modifications in effect at both CEZ NPPs Dukovany and Temelin and these TMs are treated in accordance to different plant specific guidelines. The current status does not demonstrate sufficient progress at both NPP sites. The team has made a Recommendation in this area.

6.3 CORPORATE CONFIGURATION MANAGEMENT SYSTEM

The concept of configuration management of systems and components of reactor installation is integrated into the plant modification process and TIPOM software. Any change in the design or equipment or documentation calls for respective changes in the associated areas. The Engineering Section utilizes TIPOM as a common computation platform together with the NPP sites to perform and monitor all the activities, and control all the related changes in plant design, equipment or documentation.

However, the configuration management process is not fully and clearly defined within the corporate management system, and its elements are not always consistently applied to ensure that the design requirements are maintained in all areas of the configuration management throughout all the stages of the lifetime of the plant. There is no overarching document and consistent approach in describing all of the configuration management features within the hierarchy of the corporate documentation; namely the scope, roles and responsibilities of participants, interfaces, requirements, specific procedures and records. In order to avoid potential deficiencies and impacts on the effectiveness of the configuration management process, which is understood as the corporate cross functional area as stated in "Nuclear Directors meeting," the corporate organization has recently initiated an activity on performing a GAP analysis to identify which of the corporate organizational units and to what extent is involved in configuration management activities, and how it is reflected in the corresponding corporate administrative procedures and Sectional guidelines, working procedures and manuals.

There are some Sectional Key Performance Indicators (KPIs) and tasks set up to ascertain to what extent the tasks reflect efficiency of the plant modification process in particular, and results of performance in the area of configuration management in general. However, this set of indicators is not consistent to reflect the configuration management process in its entire complexity, and does not represent comprehensively potential safety implications, as well as, an overall performance and efficiency of the system. Thus, corporate management has limited

current knowledge of the configuration management progress and opportunities to interfere into the process timely and effectively. This in turn makes it difficult to conduct comprehensive regular assessments of the configuration management system at the corporate level. The team has made a Suggestion to the plant in the area of configuration management.

6.4 PLANT LIFETIME MANAGEMENT PROCESS

ČEZ a. s. company utilizes a common approach for life-time management for both NPPs (Dukovany and Temelin). This approach is based on life-time management and aging management programmes. These programmes are based on international authorities' recommendations (IAEA, etc.).

CEZ's Life-time management and aging management programmes are well structured and cover all power plant systems, components and structures. All measures are applied using a graded approach with respect to safety. In this common approach for power plants, synergy and knowledge transfer between these power plants are utilized.

All necessary measures important for life-time management are performed according to common process and rules for both NPPs and fulfil with fulfilling all legislation requirements and international recommendations.

6.5 TECHNICAL INSPECTIONS AND DIAGNOSTICS

The Technical Inspections Section in the Technical Support Section conducts 5-10 % inspections using its own employees (other inspections are provided by vendors).

The Technical Inspection Section provides not only supervision of vendors' activities, but its own technical inspections. This measure provides connection with practice and good skills and knowledge of activities which this Section supervises.

The Technical Inspection Section employees are well trained and all have necessary important knowledge and skills in areas which they supervise.

6.6 SAFETY ENHANCEMENT PROGRAMME

A Safety Enhancement Program has been undertaken within CEZ a. s. group based on the ENSREG stress tests. Evaluation on the robustness of safety margins has been performed for both CEZ a. s. nuclear power plants on:

- Extreme weather conditions: earthquake, flooding, wind, snow;
- Potential loss of safety functions: station black out, ultimate heat sink; and
- Progression of events into severe accidents.

The programme for safety enhancements has been endorsed by SÚJB and relative conditions have been included within the licensees. A centralized organizational structure has been established to implement a Post-Fukushima enhancement programme. The programme implementation is supported by qualified personnel from CEZ a. s. Safety and Engineering sections and representatives from both nuclear power plants. CEZ coordinates safety enhancement activities, carefully monitors and performs benchmarking with other VVER design plants. Some safety enhancements have already been completed and most other enhancements are planned to be introduced within the period 2013-2017.

6.2 CORPORATE PLANT MODIFICATION PROCESS

6.2(1) Issue: The corporate process for plant modifications does not have sufficient provisions and arrangements to ensure that management of temporary modifications are conducted in a safe and effective manner.

During the review the team noted:

ČEZ a. s. has undertaken an action plan to resolve the issues identified during OSART Mission at Dukovany and Temelin NPP:

- Central Engineering Section is responsible for setting the rules for all TMs and handling of safety related TMs at both Dukovany and Temelin NPPs; however, comprehensive rules for managing of plant's temporary modifications have not been fully developed and implemented yet at corporate level.
- Plant TMs have not been introduced into a unified system (e. g., TIPOM that is used by Central Engineering to manage the process of plant modifications). The OSART Follow-up Mission to Dukovany NPP (NSNI/OSART/2013/162F Draft report of the OSART Follow-up Mission to the Dukovany NPP CR, 24 – 28 June 2013, Issue 5.3(1)) has identified that: "it was decided by the plant that a comprehensive TMs database was not considered necessary."
- TMs are registered and controlled at both Dukovany and Temelin NPPs in different databases.
- There is high number of active TMs (see OSART Temelin 2012, Dukovany 2013). Some temporary modifications could be safety-related and have existed for many years at both the Dukovany and Temelin NPPs.
- A time limit is not specified for removal of TMs, and TMs are not always transferred into permanent status as appropriate.
- There are no KPIs on TMs neither at plants level nor at the corporate, and in turn there are no regular assessments of the plants' TMs status.
- The classification of TMs is done in accordance with a corporate document CEZ_ME_0189 for Temelin NPP (first issued in 2006, and then revised in 2008) and CEZ_ME_0953 for Dukovany NPP (first issued in June 2013); however, there is no evidence that long-term TMs for both Dukovany and Temelin NPPs have been revised accordingly.
- The OSART Follow-Up mission at Dukovany NPP has identified that the newly established procedure CEZ_ME_0953 has not been applied appropriately during implementation of TMs (see NSNI/OSART/2013/162F Draft report of the OSART Follow-up Mission to the Dukovany NPP CR, 24 – 28 June 2013, page 5).

Without comprehensive management and control of the NPPs temporary modifications via sound rules and procedures, plant safety, reliability and efficiency can be compromised.

Recommendation: The corporate organization should reinforce its plant modifications process to ensure that management of temporary modifications is conducted in a safe, reliable and effective manner.

IAEA basis:

SSR-2/2

4.41. Temporary modifications shall be limited in time and number to minimize the cumulative safety significance. Temporary modifications shall be clearly identified at their location and at any relevant control position. The operating organization shall establish a formal system for informing relevant personnel in good time of temporary modifications and of their consequences for the operation and safety of the plant.

NS-G-2.3

6.3. The number of temporary modifications should be kept to a minimum. A time limit should be specified for their removal or conversion into permanent modifications.

6.5. The plant management should periodically review outstanding temporary modifications to consider whether they are still needed, and to check that operating procedures, instructions and drawings and operator aids conform to the approved configuration. The status of temporary modifications should be periodically reported (typically at monthly intervals) to the plant manager**.** Those that are found to be needed permanently should be converted in a timely manner according to the established procedure.

6.9. An appropriate procedure should be established to control temporary modifications on the plant. The following areas should be covered in this procedure:

- Designations of personnel who are allowed to initiate, approve, perform and remove temporary modifications.
- Requirements for technical reviews, in particular safety reviews to be performed before temporary modifications are made. Temporary modifications to structures, systems and components and process software important to safety should be independently reviewed by personnel not involved in the design or implementation of the temporary modification and should be submitted for regulatory approval, as required, before implementation.
- Control of documentation, to ensure that all documentation — such as operating flow sheets, operating manuals, maintenance manuals, emergency procedures— reflects temporary modifications, to ensure that the plant continues to be operated and maintained safely while the modification is in place.
- Logging, labelling and tagging of temporary modifications in a distinctive manner.
- Communication with the operating personnel, involvement of the operating personnel in the implementation process at the initial stage, and control of the temporary modifications by the operators of the main control room.
- The lifetime of a temporary modification and the procedure to extend this lifetime.
- Checking of configuration recovery and communication with personnel when a modification is removed.

6.3 CORPORATE CONFIGURATION MANAGEMENT SYSTEM

6.3(1) Issue: The configuration management process is not fully and clearly defined in the corporate management system and its elements are not always consistently applied to ensure that the design requirements are maintained in all areas of the configuration management throughout all the stages of the lifetime of the plant.

During the review the team identified:

- There is no overarching document and consistent approach in describing all of the configuration management features within the hierarchy of the corporate documentation; namely the scope, roles and responsibilities of participants, interfaces, requirements, specific procedures and records. Responsibilities of the corporate design authority, organizational units, original designer, suppliers, other design organizations, construction, commissioning, decommissioning organizations, operator (including maintenance, training and operations) the in area of configuration management are not clearly and consistently outlined at the corporate level.
- In order to avoid potential deficiencies and impacts on the effectiveness of the configuration management process, which is understood as the corporate cross functional area as stated in "Nuclear Directors meeting," the corporate organization has initiated an activity on the GAP analysis to identify which of the corporate organizational units, and to what extent, are involved in configuration management activities.
- There is no specific set of top level KPIs that reflect comprehensively the effectiveness of the configuration management process at the corporate level.

Without a clearly defined and implemented process of the configuration management, including roles and responsibilities of the participating bodies, the plant's design integrity may not be ensured.

Suggestion: The corporate organization should consider clearly defining its process for configuration management, and consistently apply its elements to ensure that design requirements are maintained in all areas of the configuration management throughout all the stages of the lifetime of the plant.

IAEA basis:

SSR-2/2

Requirement 10: Control of plant configuration

The operating organization shall establish and implement a system for plant configuration management to ensure consistency between design requirements, physical configuration and plant documentation.

4.38. Controls on plant configuration shall ensure that changes to the plant and its safety related systems are properly identified, screened, designed, evaluated, implemented and recorded. Proper controls shall be implemented to handle changes in plant configuration that result from maintenance work, testing, repair, operational limits and conditions, and plant refurbishment, and from modifications due to ageing of components, obsolescence of technology, operating experience, technical developments and results of safety research.

Requirement 26: Operating procedures

7.4. Operating procedures and supporting documentation shall be issued under controlled conditions, and shall be subject to approval and periodically reviewed and revised as necessary to ensure their adequacy and effectiveness. Procedures shall be updated in a timely manner in the light of operating experience and the actual plant configuration.

Requirement 31: Maintenance, testing, surveillance and inspection programmes

8.10. The work control system shall ensure that plant equipment is released from service for maintenance, testing, surveillance or inspection only with the authorization of designated operations Section staff and in compliance with the operational limits and conditions. The work control system shall also ensure that permission to return equipment to service following maintenance, testing, surveillance and inspection is given by the operating personnel. Such permission shall be given only after the completion of a documented check that the new plant configuration is within the established operational limits and conditions and, where appropriate, after functional tests have been performed.

Requirement 32: Outage management

8.19. In the processes for planning and performing outage activities, priority shall be given to safety related considerations. Special attention shall be given to maintaining the plant configuration in accordance with the operational limits and conditions.

GS-G-3.5

Configuration management

5.141. Configuration management is fundamental to safe operation. Configuration management is the process of identifying and documenting the characteristics of the systems and components (including computer systems and software) at an installation and ensuring that consistency is maintained between the design requirements, the physical configuration and the configuration documentation of the installation and its systems and components. For example, after maintenance is carried out, the installation systems and components should be returned strictly to their design configuration.

5.142. The principal concern relating to inadequate configuration management is the loss of the ability to perform safety actions when these are needed. Not having the right information available at the right time and in the right format for use by engineering and operations personnel can lead to human errors with potential consequences for safety as well as economic consequences. In many cases, the effort required responding to and to correct these errors is greater than the effort required to maintain the plant and its structures, systems and components in their design configuration.

5.143. It is assumed that every organization has already knowingly or unknowingly employed the concept of configuration management. The extent of the application of configuration management and its status may be different at different installations, depending on the management’s experience of and awareness of configuration management.

5.144. Configuration management should be used to ensure that the construction, commissioning, operation, maintenance and testing of the installation are in accordance with

the design requirements as established in the design documentation, and that this consistency is maintained, where appropriate, throughout all stages of the lifetime of the installation, particularly when changes are made.

5.145. It is recognized that there are three elements in configuration management that should be consistent with each other: (i) design requirements, (ii) configuration documentation for the installation and (iii) the physical configuration.

(a) Design requirements are technical requirements. They are derived from standards, regulatory requirements and the design process, they impose limits on the final design, including the consideration of margins, and they are reflected in the design documentation.

(b) The configuration documentation for the installation is the set of all documents that contain information on the configuration, recording how the plant and its structures, systems and components are designed, operated and maintained. Configuration documentation should be traceable to installed equipment. It can be categorized as either:

– Design information;

– Information on the operational configuration; or

– Other information on the configuration considered necessary for procurement, operation, maintenance and training activities.

(c) Physical configuration applies to the installed and subsequently commissioned structures, systems and components and to their operational configuration.

5.146. The configuration management process should include:

(a) Programme planning;

(b) Criteria on the scope of the physical configuration;

(c) Criteria on the scope of the configuration documentation for the installation;

(d) Concepts and terminology;

(e) Information system for configuration control;

(f) Configuration audits and assessments;

(g) Training on configuration management.

5.147. The process of configuration management should be used to ensure that responsibilities are specified, including responsibilities for the design bases, the safety analysis bases, the design processes, operation, maintenance and the change processes. This description of responsibilities should specify clearly who is responsible for each activity, including the interfaces and transfer of responsibilities, and for documents and related information. The responsibilities of the following organizations should also be specified in the configuration management process:

(a) The original or principal designer (if involved);

(b) The suppliers (if involved);

(c) The design organization in charge of modifications to the design (if not the same as the original designer);

(d) The construction, commissioning, operating and decommissioning organizations (including maintenance, training and operations);

(e) Any corporate or company level organizations or Sections (if involved).

Plant modification

5.148. A process should be established and implemented to control modifications to the structures, systems and components and to any associated software. Further guidance is provided in Refs [29, 30].

Maintenance

5.149. A process should be established and implemented to control maintenance of the systems, structures and components of the installation. Further recommendations and guidance are provided in Refs [8, 9].

5.178. Configuration management systems provide a mechanism for identifying, controlling and tracking the versions of software items and their associated documentation. Configuration management systems may be paper based or may be implemented using software tools, or a combination of both techniques may be used.

5.179. Plant control software that could affect the safe and reliable operation of the installation, such as computer codes and data used in computerized protection and control systems, should be verified and validated. Installed plant control software should be subject to periodic checking to ensure the continued integrity of computer programs. Further recommendations and guidance are provided in Ref. [15].

7. PROCUREMENT

7.1. ORGANIZATION AND FUNCTIONS

The organization of the Procurement Section consists of six sub-sections. The following are involved in safety related items:

- Procurement /storage – warehouses and tools management for conventional plants;
- Fuel cycle; and
- Procurement for production for NPP material and services

All procurement activities are performed in accordance with the Czech Republic's regulation, Atomic Act 18/1997, decrees 132/2008 and 309/2005 and Public Procurement Act 137/2006.

One part of the procurement section staff is located at each nuclear power plant site to perform the reception of materials and spare parts, manage the warehouses and ensure the distribution. This organization should ensure a good communication with the requesters of materials and services, and should facilitate the feedback process. Regular meetings are held with internal customers (plant management, central engineering and asset management) and monthly meetings with suppliers.

However, taking into account the feedback from the regulator about deficiencies due to the procurement process before 2011 and after analysis of the process, the team encourages the corporate organization to reinforce the importance of the plants' feedback and to develop indicators on quality of safety related items procurement.

The procurement activities are controlled through four processes:

- N01 Procurement;
- N02 Storage;
- N03 Sales other than electricity; and
- N04 Fuel and operating consumables

The procurement process begins with a procurement request in PASSPORT or SAP application. Additional specifications to the procurement request can be added by specialized Sections through the TIPOM application. The procurement request is reviewed and analyzed by the requester's manager, by specialized Sections and again by procurement. The method of commercial provisions is decided by the managers of the requester and the purchaser. In case of a tender, a tendering committee is appointed unless there is only one possible supplier, and then it will be processed as a direct order. In most of the cases, the tendering procedure is based on a multi-criteria procedure. Proposed resolution about the selected supplier is submitted by the committee to the managers of the requester and of the purchaser.

All master documents and forms in connection with the procurement process are standardized and shared through a specific database. This ensures the overall quality and consistency of the procurement documentation, quick updating of documents in case of changes in the regulation, improves the clarity of inputs and reduces the number of errors. The team considers this as a Good Performance.

7.2 PROCUREMENT STAFF QUALIFICATION

The organization has defined a catalogue of qualification requirements for each position in the procurement Section, including competence, training and retraining needs.

The qualification is tracked automatically in the dedicated application of SAP. Alerts are sent to both the individual and his/her manager before expiration of the qualification so that retraining can be scheduled to ensure the continuity.

E-Learning modules are fairly developed and used by the organization.

A shared space (forum) has been opened in another application to allow procurement staff to share experience and know how in a very direct and efficient manner.

7.3 SPARE PARTS AND MATERIALS

The responsibilities of the personnel involved in the procurement process are clearly defined and allocated:

- The requesters are defining what they need, the quality grade depending on the importance for safety, technical specifications and stock levels. They are involved in price and technical negotiations.
- The procurement section is in charge of the supplier selection together with the requester, is responsible for the price and prepares the contract. These latest are signed by both the requester and the purchaser.
- The independent receiving inspectors are performing control before sending out the procurement order and on receipt of any nuclear safety, technical safety or radiation protection item.
- The warehouse staffs are responsible for quality and quantity control, storing in compliance with storage requirements and issuing items on request.

The control of receipt is effectively performed at two levels for nuclear safety, industrial safety and radiation protection related items:

- The first control is performed by the warehouse staff. It consists of a quantity and quality control.
- The second control is made by the technical inspection and diagnosis group (TKD)
-

The corporate organization has developed a catalogue of materials for the Production Section in which each item has an ID Card describing its characteristics, as per regulation 132/2008 and 309/2005 for safety-related items.

Each item is identified by a code and there are nine categories of codes: four for new spares, four for renovated ones, and one for spares to be renovated. These latest are identified and stored in a separate location to prevent their use.

The minimum and maximum stock levels for spare parts or other materials are defined by the requester.

The existing organization with procurement staff being present at each NPP site allows regular meetings with the requesters. A review of spare parts with a risk analysis is performed to identify critical spares and to anticipate potential problems of supply.

The two systems PASSPORT and SAP MM support the traceability of spare parts from the emission of the work order to the installation. SAP SRM is the application that registers and generates all documentation related to the procurement of any item.

All chemicals are supplied with the relevant safety related instructions and labelled.

Managing of obsolete material is a centralized engineering process.

7.4 SERVICES

Basically the process for services procurement is the same as for material and equipment in terms of qualification and selection of contractors, tendering and selection of offers. Contractors are systematically evaluated after performance against performance indicators and objectives. The contractor's evaluation is a continuous process for the monitoring of supplier's performance. Specific actions based on evaluation results are described in ČEZ document ČEZ_PP_0362. The results are used and actions are implemented by three parties – plants (internal customers), procurement division and supplier system management section.

7.5 MONITORING OF THE PROCUREMENT PROCESS

Since 2011, a self-assessment is performed every year at the section level on three projects per each section, and one at the director level. Improvement opportunities identified are treated through appropriate actions and their effectiveness evaluated after implementation.

Focused quality audits are performed regularly.

In June 2013, a complete audit has been performed that identified, among others, the lack of performance evaluation. Consequently, a set of KPIs was developed and trending performed retroactively from 2008 through 2012.

Suppliers of material, equipment and services are systematically evaluated through multi-competence audits involving procurement, requesters, and associated Sections (TKD, TS, NS, RP, Chemistry, etc.)

7.6 PROCUREMENT OF NUCLEAR FUEL

The Strategies for front and back end of fuel are clearly defined. (Front end is from U3O8 to fresh fuel delivery; – back end is spent fuel, rad waste and decommissioning).

The nuclear fuel procurement is ruled through two main processes defined in procedures N04.01 describing the procurement of Nuclear Material, and N04.02 describing the procurement of Nuclear Fuel.

These processes are fully complying with the Euratom Supply Agency and SÚJB requirements.

Job descriptions and qualifications of fuel procurement staff are managed in SAP.

The qualification of fuel procurement staff is based on: education (university degree);, experience practice,; and specific training, including nuclear safety and one week in the plant,

plant technology, access to restricted/secret information, psychological testing for unescorted access in NPPs.

A process of continuous improvement is based on participation in international organizations events (WNA, COPAG, EPRI …) and residency (fuel fabrication, NPP, R&D…).

The process of nuclear fuel (NF) procurement has several steps:

- Selection of available suppliers
- Competitive tendering
- Contracting
- NF licensing
- Administration of Contracts
- Delivery Orders
- Application for authorizations, licenses, permits for NF delivery
- Record keeping / reporting
- Contracting for technical development
- Participation in organizations / projects

It is important to underline that throughout the process, the organization is supported by the research institute UJV and the vendor SKODA in term of independent evaluation of various safety analyses.

To ensure a continuous oversight of the fuel fabrication, the organization qualified and contracted an independent provider for performing safety and quality controls and acceptance inspections of fuel fabrication in the manufacture. The team considered this as a Good Practice.

The scope of inspections is defined in the programme of quality assurance control (PKK). The organization maintains a Nuclear Fuel Manufacturing Database for both FNF 440 and FNF 1000. For each individual NF shipment, the NF supplier has to provide a data package in accordance with contractual specification for both NPPs. The database allows for independent evaluation and assessment of some aspects of fabrication features that are part of the PKK. The uniqueness of the database and its use are considered as a Good Practice.

Modifications of Fuel design/change of supplier.

These activities fall under the Regulation No. 195/1999 Sb. of SÚJB which requires going through a licensing process and obtaining the approval of the regulator as it is considered as a modification of the design. This has been applied for the change of fuel supplier of Temelin units.

The fuel supplier basic requirements are that the design of the fuel must be licensable in the country of origin; the national licensing framework must be taken in account, as well as other specific industry standards. Computer codes that are used in the design of the fuel shall be qualified by SÚJB.

The winner of the contract provides the design of the core based on his experience in the same type of reactor. The organization performs an independent assessment during the four first supplies to gain experience on the new design, and takes the full responsibility of the

design for the following reloads with an independent assessment by a research institute and the supplier .

Fuel transport and delivery

With respect to the recommendation expressed by OSART mission at Dukovany NPP in 2001, the transport of NF and its delivery to the plants is considered to be ČEZ's responsibility, even if different activities are outsourced and procured by independent suppliers. The transport is a combination of air and road transport in containers that are qualified and approved in accordance with IAEA safety requirement TS-R-1.

DETAILED PROCUREMENT FINDINGS

7.6. PROCUREMENT OF NUCLEAR FUEL

7.6(a) Good Practice: Extended scope of Nuclear Fuel Fabrication Data

Description

Pursuant Nuclear Fuel Contracts governed and managed within Nuclear Fuel Cycle Unit for NPPs, a Nuclear Fuel Fabrication Data file is provided by the Fuel Supplier for ČEZ´s disposal for each fuel batch delivery. Data is gathered by the supplier in accordance with contract technical specification structure that is continuously reviewed and updated following fuel manufacturing and inspection methods in the fabrication plant. Upon handover to ČEZ, the data is stored and maintained in a database operated by the Fuel Cycle Unit staff for different purposes.

Benefits

This process is transparent, both in the general and detailed knowledge on Nuclear Fuel fabrication material characteristics individualized to each Fuel Assembly delivered to ČEZ.

Results

Existence of a Nuclear Fuel Database that is applicable for different analyses of Nuclear Fuel characteristics, such as trends in uranium balance tolerances, Zirconium alloys investigations, and inputs for safety analyses calculations. A high level degree of information relative to Nuclear Fuel is available to the NPP Owner for independent safety related research and enables qualified discussion with the Fuel Supplier in this task area as well as the appropriate response to each possible negative impact in fabrication process.

7.6(b) Good Practice: Nuclear Fuel Quality Control and Inspection performed by Third Party

Description

Pursuant to the Nuclear Fuel Contracts governed and managed within Nuclear Fuel Cycle Unit for the Owner of the NPPs, there exists a provision enabling assignment of a resident surveillance body to any Nuclear Fuel Supplier facility for all or any part of the time Nuclear Fuel production for the Owner is being performed in such facilities. Following this, there is established by the Owner a contract in cooperation with the company independent of the Supplier, regarding continuous monitoring, surveillance, inspection and acceptance of Nuclear Fuel and all its components in the Supplier´s fabrication plants during all phases of fabrication.

Benefits

The Owner is continuously acquiring both overall and detailed reports containing independent and objective information on all, either standard or non-standard aspects of Nuclear Fuel manufacturing and inspection process, not only in accordance with quality control and inspection plan agreed upon among the Owner, Supplier and independent body.

Results

The purpose of the task is to have available upper level of information on surveillance of Nuclear Fuel fabrication process. An important attribute of the activity is the principle of separated – individualized evidences of Nuclear Fuel components relative to the manufacturing of the Nuclear Fuel for the Owner in every phase of production chain.

DEFINITIONS

DEFINITIONS – OSART MISSION

Recommendation

A recommendation is advice on what improvements in operational safety should be made in that activity or programme that has been evaluated. It is based on IAEA Safety Standards or proven, good international practices and addresses the root causes rather than the symptoms of the identified concern. It very often illustrates a proven method of striving for excellence, which reaches beyond minimum requirements. Recommendations are specific, realistic and designed to result in tangible improvements. Absence of recommendations can be interpreted as performance corresponding with proven international practices.

Suggestion

A suggestion is either an additional proposal in conjunction with a recommendation or may stand on its own following a discussion of the pertinent background. It may indirectly contribute to improvements in operational safety but is primarily intended to make a good performance more effective, to indicate useful expansions to existing programmes and to point out possible superior alternatives to on-going work. In general, it is designed to stimulate the utility management and supporting staff to continue to consider ways and means for enhancing performance.

Note: if an item is not well based enough to meet the criteria of a 'suggestion', but the expert or the team feels that mentioning it is still desirable, the given topic may be described in the text of the report using the phrase 'encouragement' (e.g. The team encouraged the utility to…).

Good practice

A good practice is an outstanding and proven performance, programme, activity or equipment in use that contributes directly or indirectly to operational safety and sustained good performance. A good practice is markedly superior to that observed elsewhere, not just the fulfilment of current requirements or expectations. It should be superior enough and have broad application to be brought to the attention of other nuclear power utilities and be worthy of their consideration in the general drive for excellence. A good practice has the following characteristics:

- novel;
- has a proven benefit;
- replicable (it can be used at other utilities);
- does not contradict an issue.

The attributes of a given ‘good practice’ (e.g. whether it is well implemented, or cost effective, or creative, or it has good results) should be explicitly stated in the description of the ‘good practice’.

Note: An item may not meet all the criteria of a ‘good practice’, but still be worthy to take note of. In this case it may be referred as a ‘good performance’, and may be documented in the text of the report. A good performance is a superior objective that has been achieved or a good technique or programme that contributes directly or indirectly to operational safety and sustained good performance, that works well at the utility. However, it might not be necessary to recommend its adoption by other nuclear power utilities, because of financial considerations, differences in design or other reasons.

LIST OF IAEA REFERENCES (BASIS)

Safety Standards

- **SF-1**; Fundamental Safety Principles (Safety Fundamentals)
- **GSR Part 3;** Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, Interim Edition
- **SSR-2/1**; Safety of Nuclear Power Plants: Design (Specific Safety Requirements)
- **SSR-2/2**; Safety of Nuclear Power Plants: Operation and Commissioning (Specific Safety Requirements)
- **NS-G-1.1**; Software for Computer Based Systems Important to Safety in Nuclear Power Plants (Safety Guide)
- **NS-G-2.1**; Fire Safety in the Operation of Nuclear Power Plants (Safety Guide)
- **NS-G-2.2**; Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants (Safety Guide)
- **NS-G-2.3**; Modifications to Nuclear Power plants (Safety Guide)
- **NS-G-2.4**; The Operating Organization for Nuclear Power Plants (Safety Guide)
- **NS-G-2.5**; Core Management and Fuel Handling for Nuclear Power Plants (Safety Guide)
- **NS-G-2.6**; Maintenance, Surveillance and In-service Inspection in Nuclear Power Plants (Safety Guide)
- **NS-G-2.7**; Radiation Protection and Radioactive Waste Management in the Operation of Nuclear Power Plants (Safety Guide)
- **NS-G-2.8**; Recruitment, Qualification and Training of Personnel for Nuclear Power Plants (Safety Guide)
- **NS-G-2.9**; Commissioning for Nuclear Power Plants (Safety Guide)
- **NS-G-2.11**; A System for the Feedback of Experience from Events in Nuclear Installations (Safety Guide**)**
- **NS-G-2.12**; Ageing Management for Nuclear Power Plants (Safety Guide)
- **NS-G-2.13**; Evaluation of Seismic Safety for Existing Nuclear Installations (Safety Guide)

- **NS-G-2.14;** Conduct of Operations at Nuclear Power Plants (Safety Guide)
- **NS-G-2.15**; Severe Accident Management Programmes for Nuclear Power plants Safety Guide (Safety Guide)
- **SSG-13**; Chemistry Programme for Water Cooled Nuclear Power Plants (Specific Safety Guide)
- **SSG-25**; Periodic Safety Review for Nuclear Power Plants (Specific Safety Guide)
- **GSR**; Part 1 Governmental, Legal and Regulatory Framework for Safety (General Safety Requirements)
- **GS-R-2**; Preparedness and Response for a Nuclear or Radiological Emergency (Safety Requirements)
- **GS-R-3**; The Management System for Facilities and Activities (Safety Requirements)
- **GSR** Part 4; Safety Assessment for Facilities and Activities (General Safety Requirements 2009)
- **GS-G-4.1**; Format and Content of the Safety Analysis report for Nuclear Power Plants (Safety Guide 2004)
- **SSG-2**; Deterministic Safety Analysis for Nuclear Power Utilitys (Specific Safety Guide 2009)
- **SSG-3**; Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants (Specific Safety Guide 2010)
- **SSG-4**; Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants (Specific Safety Guide 2010)
- **GS-R Part 5**; Predisposal Management of Radioactive Waste (General Safety Requirements)
- **GS-G-2.1**; Arrangement for Preparedness for a Nuclear or Radiological Emergency (Safety Guide)
- **GSG-2**; Criteria for Use in Preparedness and Response for a Nuclear and Radiological Emergency
- **GS-G-3.1**; Application of the Management System for Facilities and Activities (Safety Guide)
- **GS-G-3.5**; The Management System for Nuclear Installations (Safety Guide)
- **RS-G-1.1**; Occupational Radiation Protection (Safety Guide)

- **RS-G-1.2**; Assessment of Occupational Exposure Due to Intakes of Radio-nuclides (Safety Guide)
- **RS-G-1.3**; Assessment of Occupational Exposure Due to External Sources of Radiation (Safety Guide)
- **RS-G-1.8**; Environmental and Source Monitoring for Purpose of Radiation Protection (Safety Guide)
- **SSR-5;** Disposal of Radioactive Waste (Specific Safety Requirements)
- **GSG-1** Classification of Radioactive Waste (Safety Guide 2009)
- **WS-G-6.1**; Storage of Radioactive Waste (Safety Guide)
- **WS-G-2.5**; Predisposal Management of Low and Intermediate Level Radioactive Waste (Safety Guide)

▪ ***INSAG, Safety Report Series***

INSAG-4; Safety Culture

INSAG-10; Defence in Depth in Nuclear Safety

INSAG-12; Basic Safety Principles for Nuclear Power Utilitys, 75-INSAG-3 Rev.1

INSAG-13; Management of Operational Safety in Nuclear Power Utilitys

INSAG-14; Safe Management of the Operating Lifetimes of Nuclear Power Utilitys

INSAG-15; Key Practical Issues In Strengthening Safety Culture

INSAG-16; Maintaining Knowledge, Training and Infrastructure for Research and Development in Nuclear Safety

INSAG-17; Independence in Regulatory Decision Making

INSAG-18; Managing Change in the Nuclear Industry: The Effects on Safety

INSAG-19; Maintaining the Design Integrity of Nuclear Installations Throughout Their Operating Life

INSAG-20; Stakeholder Involvement in Nuclear Issues

INSAG-23; Improving the International System for Operating Experience Feedback

INSAG-25; A Framework for an Integrated Risk Informed Decision Making Process

Safety Report Series No.11; Developing Safety Culture in Nuclear Activities Practical Suggestions to Assist Progress

Safety Report Series No.21; Optimization of Radiation Protection in the Control of Occupational Exposure

Safety Report Series No.48; Development and Review of Utility Specific Emergency Operating Procedures

Safety Report Series No. 57; Safe Long Term Operation of Nuclear Power Plants

- ***Other IAEA Publications***

  - **IAEA Safety Glossary** Terminology used in nuclear safety and radiation protection 2007 Edition

  - **Services series No.12**; OSART Guidelines

  - **EPR-EXERCISE-2005**; Preparation, Conduct and Evaluation of Exercises to Test Preparedness for a Nuclear or Radiological Emergency, (Updating IAEA-TECDOC-953)

  - **EPR-METHOD-2003**; Method for developing arrangements for response to a nuclear or radiological emergency, (Updating IAEA-TECDOC-953)

  - **EPR-ENATOM-2002**; Emergency Notification and Assistance Technical Operations Manual

- ***International Labour Office publications on industrial safety***

  - **ILO-OSH 2001;** Guidelines on occupational safety and health management systems (ILO guideline)

  - Safety and health in construction (ILO code of practice)

Safety in the use of chemicals at work (ILO code of practice)

TEAM COMPOSITION OF THE OSART MISSION

LIPAR Miroslav – IAEA
Team Leader
Years of nuclear experience: 37
IAEA

GEST Pierre - IAEA
Deputy Team Leader
Years of nuclear experience: 34
Review area: Procurement
IAEA

MAUCORT Eric - EDF
Years of nuclear experience: 31
Review area: Corporate Management
France

TUOMISTO Harri - Fortum, Power Division
Years of nuclear experience: 36
Review area: Independent oversight
Finland

MARCO Tony - Palo Verde Nuclear Generating
Years of nuclear experience: 18
Review area: Corporate support to provide human resources
USA

GREENMAN Angela - Nuclear Communications Safety Assessments Consulting,
Years of nuclear experience: 20
Review area: Communications
USA

BUCUR Ionel - Cernavoda Nuclear Power Plant / SN Nuclearelectrica SA
Years of nuclear experience: 29
Review area: Maintenance
Romania

MARTYNENKO Yury - IAEA
Years of nuclear experience: 33
Review area: Technical support
IAEA

CHAPUS Christian - EDF
Years of nuclear experience: 31
Review area: Observer
France