

**ДРУШТВО ЗА ЗАШТИТУ ОД ЗРАЧЕЊА
СРБИЈЕ И ЦРНЕ ГОРЕ**



**ЗБОРНИК
РАДОВА**

**XXIX СИМПОЗИЈУМ ДЗЗСЦГ
Сребрно језеро
27- 29. септембар 2017. године**

**Београд
2017. године**

**SOCIETY FOR RADIATION PROTECTION OF
SERBIA AND MONTENEGRO**



PROCEEDINGS

**XXIX SYMPOSIUM DZZSCG
Srebrno jezero
27- 29. September 2017**

**Belgrade
2017**

ЗБОРНИК РАДОВА

XXIX СИМПОЗИЈУМ ДЗЗСЦГ
27-29.09.2017.

Издавачи:

Институт за нуклеарне науке „Винча“
Друштво за заштиту од зрачења Србије и Црне Горе

За извршног издавача:

Др Борислав Грубор

Уредници:

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Др Гордана Пантелић

ISBN 978-86-7306-144-3

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Техничка обрада:

Јелена Станковић Петровић, Гордана Пантелић

Штампа:

Институт за нуклеарне науке ”Винча”, Мике Петровића Аласа 12-14, 11351
Винча, Београд, Србија

Тираж:

150 примерака

Година издања:

Септембар 2017.

STRENGTHENING NUCLEAR SECURITY CULTURE WITHIN PUBLIC COMPANY NUCLEAR FACILITIES OF SERBIA

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ABSTRACT

Public Company Nuclear Facilities of Serbia (hereinafter PC NFS) is the only nuclear operator in Serbia. It was founded in 2009 under the Law on Ionizing Radiation together with the Serbian Regulatory Body. In autumn 2015, PC NFS has signed research agreement with IAEA under CRP on Development of Nuclear Security Culture Enhancement Solutions (NSCES) with the duration of three years with possibility to extend. Paper covers the results of the first year work on the project in the field of implementation of self-assessment methodology developed by the IAEA as well as the first half of the second year.

1. BACKGROUND AND GOAL OF THE WORK

Public Company Nuclear Facilities of Serbia (hereinafter PC NFS) is the only nuclear operator in Serbia. It was founded in 2009 under the Law on Ionizing Radiation together with the Serbian Regulatory Body. Since its establishment, PC NFS has continued all nuclear activities previously managed by Vinča Institute of Nuclear Sciences; Two research reactors (RA-final shut down and RB- zero-power critical assembly, operational but currently not-licensed), RWM facilities- old Hangars H1 and H2 with legacy waste, new hangar H3 (for the storage of intermediate and low level radioactive waste) together with the secure storage for the high activity sealed radioactive sources, waste processing facility(WPF) and closed uranium mine Kalna are the parts of the Company.

In autumn 2015, PC NFS has signed research agreement with IAEA under CRP on Development of Nuclear Security Culture Enhancement Solutions (NSCES) with following research objectives and anticipated outcomes: adoption on nuclear security objectives; defining the key actions that contributes to the strong nuclear security culture; presenting the responsibilities and roles of state, regulatory body, management and individuals in strengthening the nuclear security culture to our employees; establishing system with clear roles, objectives and responsibilities; communicate across organizational boundaries, integrated management system as a common principle for safety and security at all levels, with proper coordination and cooperation, with a result in optimum protection.

The 1st year results were first time shown at International Conference on Nuclear Security: Commitments and Actions, Vienna, Austria; 5-9 December 2016 where we have presented the results of the first self-assessment survey which has covered almost all of our employees (both security and non-security staff). Obtained results gave us the broader picture about the zero-point status of nuclear security culture and were the input for the interview phase- both group and individual where our psychologist (member of our expert team for monitoring the implementation of nuclear security culture (in charge for the development and application of self-assessment methodologies)) played the key role.

2. PREPARATION ACTIVITIES

What is nuclear security culture? What makes strong nuclear security culture and how to measure it? In [2], the IAEA says:

An effective nuclear security culture depends on proper planning, training, awareness, operations and maintenance as well as on the thoughts and actions of people who plan, operate and maintain nuclear security systems. An organization may be technical competent while remaining vulnerable if it discounts the role of the human factor. Thus, the human factor (including the upper tier of managers and leaders) is important to effective nuclear security.

Before the first self-assessment survey (which was followed with the pre-survey in order to receive the zero-point status) we had a lot of activities at the management level in order to prepare our staff:

- Revision of the procedures related to the nuclear security by in house experts (not only the staff with main responsibilities in nuclear security);
- Establishing the monitoring system for the compliance of the procedures (both safety and security);
- Engagement of staff in the process: preparation, inclusion, communication, clarification;
- Director of PC NFS, leading experts in the field of radiation safety and radiation and nuclear security has become Certified Nuclear Security Professionals (CNSP) with different specializations;
- Clarifying accountabilities between departments and looking for the accountabilities of all departments with nuclear security;
- Director of PC NFS has formed the expert team for monitoring the implementation of nuclear security culture (in charge for the development and application of self-assessment methodologies);
- Team is made from the Committee for radiation and nuclear safety and security+ psychologist, Head of the Department for Radiation Safety, Head of Department for Development and Application of Nuclear Technologies-eight people together;

During the preparation activities in order to prepare surveys we had in mind key considerations: message given to employees, assurance of anonymity, how the results will be used, survey methods and timelines.

3. PRE-SURVEY

Before the first self-assessment survey PC NFS expert team has provided two statement task for all staff:

- *How would you describe nuclear security system in the PC NFS?*
- *How would you describe nuclear security culture in the PC NFS?*

The expert team has provided about 100 questioners and received 75 feedbacks. All the staff was grouped by age (<40, 41-53, 54-65), education (high school, BSc and higher) and work position (security and non-security).

20 people with BSc and higher education has provided the answers to the first statement which was the same or close to the definition (14 of them was not the security staff).

Only 10% of the staff was not sure how to classify their work position (security or non-security).

4. FIRST SELF-ASSESSMENT (PREPARATION, RESULTS AND DISCUSSION)

Our first self- assessment survey had 17 statements in total (management system-6, leadership behavior-8, personnel behavior-3) and the 7-point scale (from strongly agree to strongly disagree):

1. *Nuclear security is a clearly recognized value in our organization.*
2. *The organization has clearly defined and documented roles and responsibilities for all nuclear security positions.*
3. *Individuals' expertise and special skills relevant to security are recognized, used and rewarded by the organization, regardless of their formal standing within the organization.*
4. *Staff members at all levels are encouraged to report problems and make suggestions for improving performance of the nuclear security system.*
5. *When an error or event occurs, the question asked is 'What went wrong?' not 'Who was wrong?' with the focus on improvement, not blame.*
6. *Contingency plans are in place to address the defined threats and responses.*
7. *Leaders do not abuse their authority to circumvent security.*
8. *Managers hold people accountable for their behaviour.*
9. *Managers help to build trust and promote teamwork within the organization.*
10. *I am actively involved in identification, planning and improvement of security-related work and work practices.*
11. *For me, security procedures are not regarded as an excessive burden.*
12. *When I participate in security training it is given a high priority and is not disrupted by non-urgent activities.*
13. *I am aware of the systems of rewards and sanctions relating to nuclear security.*
14. *I take professional pride in my work.*
15. *I get help from my colleagues when I need it and they interact with professional courtesy and respect.*
16. *I avoid shortcuts in implementing security procedures.*
17. *I know that survey is one of the ways of self-assessment and that it is important part for security culture.*

The expert team has provided around 100 questioners and received 93 feedbacks. All feedbacks were taken into account for the analysis. The sample structure was the same as it was for the pre-survey (age, education, position). Figure 1. and Table 1. shows the average results for all the categories and average results for all the statements-respectively:

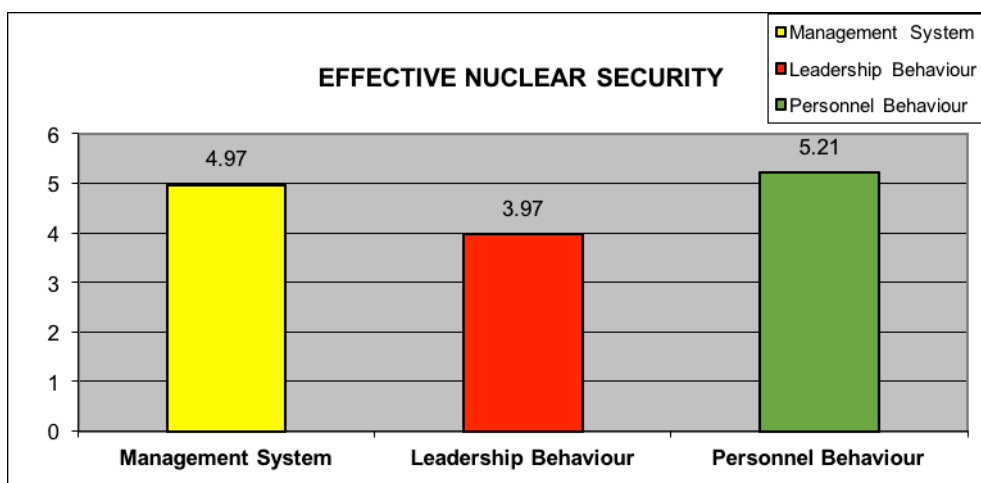


Figure 1. Average results for all the categories

Table 1. Average results for all the statements

	Statement/Average							
Management System	1 4.46	2 4.22	11 5.91	12 5.02	6 4.63	17 5.59		
Leadership Behavior	3 3.38	4 3.91	5 3.76	7 4.46	8 4.87	9 3.94	10 3.37	13 3.83
Personnel Behavior	14 5.51	15 5.30	16 4.83					

All the statements with the average values under 4 were analyzed in much more details. Staff on the positions related to the security was much more critical (value 7 was very rare). Non-security staff didn't provide low values (1, 2 and 3) on most of the statements.

It is a very positive sign that the average value of the statements related to the management system is 4.97 (close to the border between yellow-green) and we need to point out that the best average results were on the statements related to this. This means that we need minor adjustments, and we will continue with intensive efforts in this field. In the field of leadership behaviour, motivation is part of the framework where we should do much more. Also, we need to improve communication between staff and management by involving the staff in all aspects of preparing, organizing and carrying out operations. For staff who work in the field of nuclear security we have seen more critical assessment of the provided questions. This trend was expected because the survey content was much more appropriate to their field of work and the larger experience that requires critical review.

5. CONCLUSION

PC NFS has clearly defined zero-point status in the field of nuclear security culture. We will continue our work by preparing new trainings (in order to educate our staff, both security and non-security) which will be held by internal experts and in cooperation with other institutions like IAEA and US DoE (up to date, we have organized four workshops from different nuclear security fields for our staff as well as for the

representatives from all relevant institutions). Nuclear security is clearly recognized in a PC NFS strategic plan and it is given same priority as safety (Department for nuclear security was formed in the summer of 2016), and nuclear security culture is recognized as the foundation of nuclear security system. All the interview questions were adopted by the expert team for monitoring the implementation of nuclear security culture and we expect to prepare complete analysis before October 2017. After we finish with the interview process, our first self-assessment will be complete.

6. REFERENCES

- [1] Law on Radiation Protection and Nuclear Safety, Sl.gl. RS 36/09 i 93/12.
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- [4] Nuclear Security Culture Revision 3.0, WINS International Best Practice Guide 1.4, WINS, 2016.
- [5] Regulation on the Security Measures of Nuclear Facilities and Nuclear Materials, Sl.gl.RS 39/14.

JAČANJE NUKLEARNE BEZBEDNOSNE KULTURE U JAVNOM PREDUZEĆU „NUKLEARNI OBJEKTI SRBIJE“

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SADRŽAJ

Javno Preduzeće „Nuklearni objekti Srbije“ (u nastavku JP NoS) je jedini nuklearni operator u Republici Srbiji. Osnovano je 2009. godine zajedno sa Agencijom za zaštitu od jonizujućih zračenja i nuklearnu sigurnost Srbije. U jesen 2015. godine, JP je potpisalo istraživački sporazum sa MAAE o okviru koordinisanog istraživačkog projekta: Development of Nuclear Security Culture Enhancement Solutions (NSCES) u trajanju od tri godine, sa mogućnošću nastavka. Rad pokriva rezultate rada u prvoj godini trajanja projekta na polju implementacije metoda samo-procena koju je razvila MAAE u cilju jačanja nuklearne bezbednosne kulture (rezultati su prvi put prezentovani na Konferenciji iz nuklearne bezbednosti organizovane od strane MAAE u decembru 2016. godine) kao i rezultatima iz prve polovine druge godine trajanja projekta.