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HUMAN RESOURCES STRATEGY IN THE SCIENTIFIC RESEARCH CENTER FOR CBRN DEFENSE AND ECOLOGY

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Abstract:
Scientific Research Center for CBRN Defense and Ecology (CCSACBRNE) is a part of the Military Equipment and Technologies Research Agency (METRA), under the Coordination of Department of Armament. CCSACBRNE has been continuously authority of consultancy and technical expertise of the Ministry of National Defense in the field of Chemical, Biological, Radiological and Nuclear (CBRN) defense After 1989 there were a number of changes of technical, economic, social and juridical with important consequences on research and development process. Most technical and economic problems were surmounted by great flexibility and constant adaptation to economic and political environment. However, the challenges of human resources prove most difficult to overcome, with consequences on the future of the institution. This paper presents a proposal for a strategy designed to support human resources.

Key words: CBRN, scientific research, challenges, human resources, strategy

1. Introduction

By ministerial approval on the report of the Romanian General Staff no. 665 from October 31st 1924, Section IV – Gases of the General Staff became the Gas Defense Service. This service included at that time three major components: a **research laboratory,** the central gas mask workshop, a gas school. The name of the research laboratory was changed during the years, such as: Research Laboratory of the Gas Defense Service (1924-1934); Army Studies and Experiments Laboratory (1934-1951); Central Laboratory 508, Chemical (1951-1959); Central Laboratory 124, Chemical (1959-1966); Scientific Research Center for Military Chemistry (1966-1998); Scientific Research Center for NBC Protection Materiel (1998-2001); Scientific Research Center for NBC Defense and Ecology (2001-2010); Scientific Research Center for CBRN Defense and Ecology (present name since 2010).

Since 1998, Scientific Research Center for CBRN Defense and Ecology (CCSACBRNE) is a part of the Military Equipment and Technologies Research Agency (METRA), under the coordination of Department of Armaments.

CCSACBRNE has continuously been a consultancy and expertise technical authority of the Ministry of National Defense in the field of chemical, biological, radiological and nuclear (CBRN) defense, with the primary mission to develop specific technologies and equipment for the use of all military services, the civil protection, and

other structures of the National Defense System (such as Romanian Intelligence Service, Romanian Ministry of Administration and Interior, etc.).

CCSACBRNE actual field of research consists of (but it is not restricted to):

- synthesis of special products, such as composites, nanomaterials, pyrotechnics, high explosives, etc.;
- chemical analyses by various analytical techniques, chemical characterization of chemical warfare agents and CBRN complex systems;
- technologies for CBRN detection, identification and decontamination;
- environmental analyses, ecological depollution/decontamination, chemical and biological agents monitoring;
- materials and equipment for chemical, biological, radiological and ballistic protection, both individual and collective;
- numerical simulation of high speed phenomena;
- analysis and characterization of new pyrotechnics, explosives and concealing systems;
- military dosimetry.

When evaluating the scientific and technical activity of the Scientific Research Center for CBRN Defense and Ecology (CCSACBRNE), it should be considered the affiliation to the National Ministry of Defense (MoD) and that the researched topics are sometimes the subject of military regulations (sensitivity of the researched technologies and products, criteria for national and international, especially NATO and EDA, military secrecy and so on).

Also, the funds for the research projects come mainly from two sources: the research and development sectoral plan (RDSP) of MoD and the calls initiated from the National Authority for Scientific Research (NASR).

2. Recent years' challenges

After 1989 there were a number of changes of technical, economic, social and sociological. The legal framework has evolved rapidly, with important consequences on research and development process. Evolution of economic phenomena more difficult to predict require organizations to adapt quickly.

In the past 20 years, the number of research centers has decreased dramatically, most fell prey to real estate sharks. Low salaries, equipment failure and poor, and opportunities for research programs in other states have driving gradually to increase the average age of highly qualified personnel in research development (R & D), so that since 2004, about 63% of Romanian researchers were aged over 40 years. In Romania, the number of employees in R & D is 0.46 to one hundred employees, 3 times lower than in EU (1.41 R & D employees to 100 employees).

In the military field the processes were similar, with some particularities. We often hear it said that we do not need research that could be best to abolish these institutions and to buy equipment from other countries. Other say that we are too poor to afford research and development and that the economic, research is a luxury and only the rich can afford it. Today, we can say that only a miracle made the research centers of the army was not disbanded. On the other hand it took a great flexibility to meet challenges and political uncertainty, economic and juridical.

Lack of funds for investments made to increase the number of research projects funded by external sources and the number of testing activities, micro production, intervention CBRN events, developing technical specifications for procurement and perform services for third parties, especially civil institutions.

The main advantages of the Centre were:

- The approach of a large field of research activities (syntheses, analyses of toxic chemical agents for purposes allowed by "Chemical Weapons Convention", technologies, CBRN decontamination equipment and materials, chemical detection, chemical control equipment, nuclear, biological, chemical, radiological and fire protection, military dosimetry, nuclear control equipment, electromagnetic concealing, high explosives, pyrotechnic compositions and devices, nonlethal and counter-terrorism combat devices, individual ballistic protection, environment balances and authorizations, interventions to CBRN and ecologic emergencies);
- The vast majority of the research activities is unique on national plan (warfare chemical agents detection and identification, chemical and radioactive decontamination of different surfaces, individual and collective protection against weapons of mass destruction, technologies for obtaining antidotes against chemical warfare agents, decontaminant agents, specific drugs, chemical warfare agents neutralization absorbents and catalyzers, specific detection reagents, electromagnetic concealing of troops and combat technique);
- The leaders and the managers have an important experience in coordinating research consortiums and in project management;
- There are modern facilities and analytic equipment in the field: instrumental analysis, detection, decontamination, explosives synthesis and analysis, CBRN and ballistic protection;
- There is a 3rd category nuclear unit, authorized by the National Commission for Nuclear Activities Control for the development of activities in the nuclear field (possession, use and transport of radioactive sources);
- Collaborations and partnerships with research institutes and universities from the country and from abroad are enhanced;
- Collaboration with the economic environment as direct beneficiaries of the products and for research results transfer gained an important attention;
- There are testing laboratories, accredited by RENAR, accordingly to SR EN ISO / CEI 17025:2005;
- the quality management system of CCSACBRNE is certified accordingly to SR EN ISO 9001:2001 for scientific research activities, design, development, microproduction, and reparations/standardization of CBRN defense technique and materials, pyrotechnical, incendiary, explosive, ballistic and concealing devices for military and civil use;
- CCSACBRNE is nationally and internationally renowned as a traditional institution in the CBRN field;
- The high management of CCSACBRNE is very adaptable to the internal and external environment.

3. The challenges of human resource management

The most difficult challenge for our center is in the human resources area.

At present, the structure and the knowledge level of the staff is the following: • Total staff - 102, from 35 which is directly implied in research; • 11 scientists with PhD studies, 6 scientists PhD students.

The average age of the personnel involved in research teams is 46.52 and the personnel distribution by age is presented in Fig. 1.

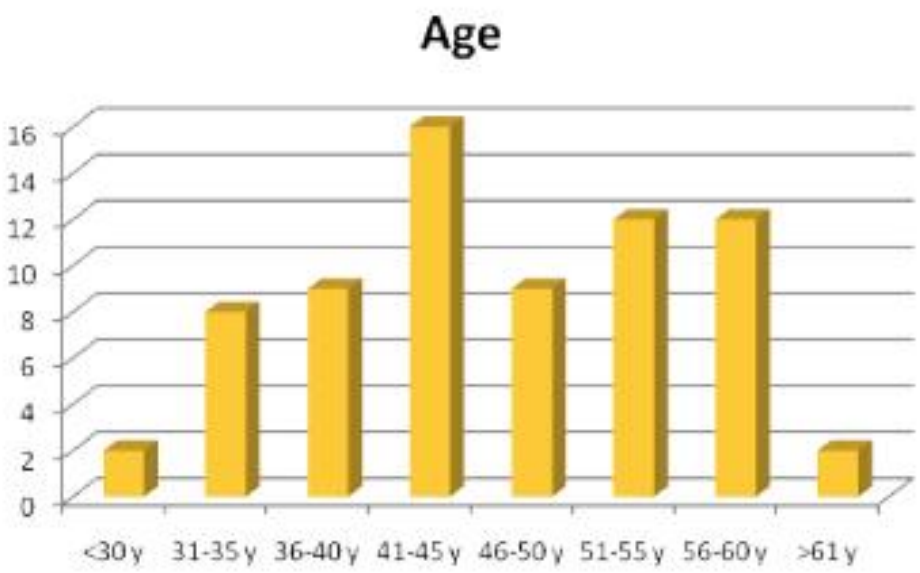

Fig.1. Research staff distribution by age

These data highlight a mature staff, with experience in research, and also the necessity of taking measures of rejuvenation, in the view of assuring the Center's perspectives; since 2008, there were not hired civilians, only 1 military officer, in 2011. In this period, approximately 30 persons left CSACBRNE due to restructuration or retirement, from whom 8 in the last year.

At this rate, the center will disappear within 15 years. Already in some areas of research activity has dropped dramatically while others have disappeared altogether.

The causes are both internal and external. In recent years, the military has undergone a restructuring process, absolutely necessary, but often made without considering the peculiarities of each unit. From this point of view, research units have a separate specific. It is known that usually researchers, doctors and teachers gain experience over time, which makes many times, from 55 years to find them a career peak. By applying undifferentiated restructuring policies, military researchers have been removed very valuable, which seriously affected the activity in certain areas.

On the other hand, until recently, issues of human resources were considered as secondary in the center, consisting of management of cases by the chief of staff. Core functions were chief administrative personnel, juridical and disciplinary and were entrusted over time of persons without any knowledge.

As a result, the Centre has no plan of human resources in accordance with development strategy. In fact it would be difficult under the redundancy process and constantly changing priorities and objectives at the political level. Therefore it was difficult to estimate the number of people needed and the type of skills and competencies they require.

Recruitment processes, training and reward were made arbitrarily without taking into account development goals. Before 1989 the Center staff was selected from among graduates of the polytechnic, engineers typically with very good results, for which military career assure a decent living. With the loss of material advantages, the number of researchers interested in military career declined dramatically. As a result, the Military Technical Academy started to educate groups of military chemists, every ten years. The

consequence was waves of recruitment process, at some point there are only colonels and captains in the Centre. Output forced retirement of the former made all management positions will be filled by inexperience personnel, that do not the absolute necessary stages in the training and command.

Considering that interest in research fall from year to year, hiring of civilian and military were effectuate only in the administrative zone, the main criteria for employment being relationships. Were usually engaged wives of politicians and wives of officers with good jobs in MoD. In the short term, this strategy has favorable consequences, providing the necessary protection in harsh conditions. On long term consequences were not so good, leading to the increase of the administrative staff and tensioning relations between the administrative staff and research. All culminated when 15 scientists were dismissed for other than professional criteria, to the detriment of others who had relationships.

In addition, the share of female personnel, to the detriment of the male and the share of civilians to the detriment of officers, led to the development of new types of disputes.

Change of legislative frameworks of made to reward employees on other criteria than professional criteria.

Civilian researchers are paid by civil legislation while the military are not. As a result, the researchers' salaries exceeded those of the officers with leadership positions. At the same time, civilians are denied work group, even though are working in the same conditions as military. The tensions and dissatisfaction appeared here. To all this add that management positions are military, as a result a civilian will be unable to accede to such functions or for worse.

Massive staff reductions have made the tasks incumbent on a researcher to increase from year to year. If by 1989 the share of research activities was 90%, today it dropped dramatically, fulfilling part-time researchers and micro production tasks, services and intervention to CBRN events. In addition reducing to secondary education staff, their duties were taken over gradually by researchers (washing the laboratory glassware, preparing equipment, small repairs, cleaning).

Unfortunately, these problems have only been aware since 2008, when the economic crisis started to knock at the door and when perspectives of obtaining funds from another sources has decreased dramatically.

4.Human resources strategy

Since 2008 institutional development strategies and plans have been prepared in which first appeared the concept of human resource development strategy. The following objectives and priorities were established the:

- rientation of the scientific research towards priority fields of the endowment with military technique and for the national strategy of R&D, through:
- enhancement of collaboration with armed forces and command structures within MoD with operational requirements, in the view of determining the new technical requirements applicable to the armament systems resulted from the experience accumulated in operational theatres (Afghanistan, Iraq, etc.);
- R&D orientation towards the approach of these requirements through R&D collaboration with firms implied in the endowment and logistic operational support;
- R&D activities reorientation towards research subjects, which lead to products that could easily close the endowment gaps.

- Development of R&D&I infrastructure, Increase of R&D&I activities performances and importantly, increase of the human resource involved in R&D&I activities, through:

- accreditation of the research fields and attestation of doctoral advisers;
- increase of the number of researchers with PhD studies;
- encouragement of new interdisciplinary research collectives;
- development of collaborations with the academic environment from the country and from abroad.

On human resources strategy was established the following strategic objectives;

- enhancement of performance standards for the CCSACBRNE staff;
- constitution of research groups on research fields (for all the 7 laboratories);
- consolidation of managerial competences of the management staff (heads of departments and laboratories);
- enhancement of the auxiliary staff efficiency, through a better management and establishment of responsibilities and competences;
- a better and variant policy of staff stimulation, accordingly to the results obtained;
- hiring new personnel: recruiting from young graduates and from experienced specialists with good professional results (PhDs having published in different journals, having gained projects, etc.);
- replacement of the retirement-age staff with young PhDs qualified for scientific research;
- the staff employment will be correlated with the financial resources available and the actual legislation;
- the employment of specialists in research projects (for the projects that require specialties not covered by the CCSACBRNE's staff);
- recruitment of priority personnel from Military Technical Academy graduates in chemistry field;
- maintenance after the retirement age of the experienced specialists, accordingly to the legislation;
- staff selection based on performance criteria, using the actual procedures.
- rapid and efficient integration of the new staff within Center's research structures, through:
- achievement of a minimum one-week stage in all the research teams in the view of familiarization with CCSACBRNE's activities;
- professional assistance from the team leaders and the experienced scientists;
- achievement, from the first year, of research projects in the view of capacities and perspectives evaluation for pursuing a research carrier within CCSACBRNE.
- continuous instruction of the staff through:
- specific specialization courses, formation courses, participation in scientific events, etc.;
- improvement of performance criteria used for the staff annual evaluation;
- reduction of work tasks other research;
- special attention towards safety and health issues, assurance with adequate protection equipment and protection food, annual medical examination of the staff;
- annual evaluation of the staff satisfaction degree.

So far this strategy has started to yield results only in the growth of professional training. Thus, in recent years have found the following:

- there is a permanent increase in the number of articles published in ISI-quoted journals;
- there is an increase in the number of participations in international scientific conferences and congresses;
- there is an increase in number of published books and book chapters in the CCSACBRNE fields of interest;

The publication dynamics in presented in Fig. 2.

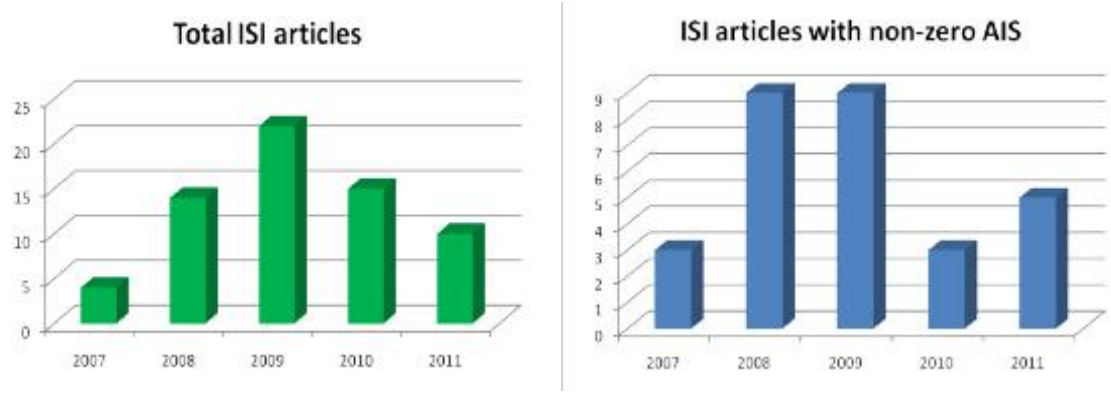

Fig.2. The publication evolution in the period 2007-2011

Also, 11 of 35 scientists have a PhD degree in various areas of interest for CCSACBRNE, such as: chemical engineering, chemistry, mechanical engineering, industrial engineering. 6 other scientists are PhD students in prestigious doctoral schools: University of Bucharest, University POLITEHNICA of Bucharest and Military Technical Academy.

The dynamics of PhD degrees in the evaluated period is presented in Fig. 3.

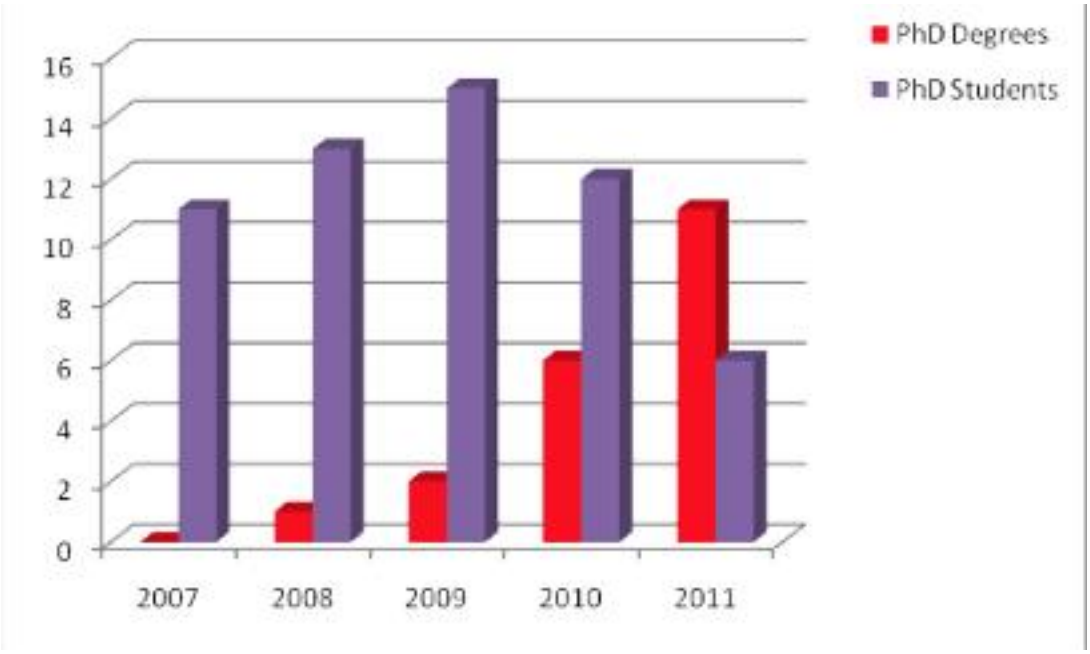

Fig.3. Evolution of PhDs and PhD students

Conclusion

Although CCSACBRNE is permanently investing in personnel training and attestation, unfortunately, being subordinated to MoD, there are not many options for applying our own human resources policy. For this reason much of the objectives can stop just at the stage of desire. However, the fact that we started to pay attention to personal problems, even in the 12th hour is a good thing.

It is obvious that the nature of human resource management problems can not be neglected or treated lightly, especially given that things are changing rapidly from day to day. And the best example is that in the Military Technical Academy of Bucharest a paradoxical situation is appearing: the best graduates are girls [2]. 70% of the actual two Chemistry groups are girls, usually the best prepared. For now, management positions are occupied by men, but are they ready to accept a change?

The survival or not of an institution that will soon turn 90 will depend on the way human resources issues will be solved.

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