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Dear readers!

A space of three years is topping off since due to the Swedish Nuclear Power Inspectorate (SKI) support we have started issuing the journal *Security and Nonproliferation.* For this, at a glance, a small period of time a lot of events both in the international arena and in our country occurred. Despite all difficulties Ukraine is forging ahead to be an inalienable part of international community. Thus, current world problems and trends influence by some means or other on what occurring in our country. On the other hand, we would like to hope that the "orange revolution" as the main "internal" event of the contemporary history of the independent Ukraine made its positive contribution in global processes.

Notwithstanding varying interpretations given by different political forces of our country to those events of autumn 2004 – winter 2005, which for a long period of time were at the top-news of news agencies in the world, perhaps, the only thing where opinions of political opponents coincide is appreciation of freedom of the press as a fundamental achievement of the "orange revolution".

It is real freedom of the press, under the lack of which possibility to build a civil society is out of the question, that is directly connected with the topics we have continuously paid attention to on the pages of *Security and Nonproliferation,* namely, strengthening civil control over and role of civil experts in the security sector of state policy, influence of civil society and non-governmental organizations on state policy in the realm of WMD nonproliferation and export control, transparency of state authorities activities in the field of arms trade and military-technical cooperation, etc.

And it looked symbolical that when preparing this issue, which was closing in the three years cycle of our activities, we had in Kyiv an important international event. On 12 December 2006 in the conference hall of Diplomatic Academy of the Ministry of Foreign Affairs of Ukraine the international round-table meeting devoted to the topic "The Role of the Public in Issues of Nonproliferation and Export Control in Ukraine". The next day, the majority of the participants of the round-table discussion took part in the informal exchange of opinions with regard to the progress of the Global Partnership projects for Ukraine. Co-organizers of the both events were the state authorities of Sweden (SKI) and Ukraine (Ministry of Foreign Affairs and State Service of Export Control), as well as the Ukrainian NGO – Scientific and Technical Center of Export and Import on the Export and Import of Special Technologies, Hardware and Materials.

From the Ukrainian side the representatives of the executive authorities – the State Nuclear Regulatory Committee, Ministry of Fuel and Energy, Ministry for Emergencies, Security Service of Ukraine, Ministry of Internal Affairs, scientific institutions of the National Security and Defense Council and National Academy of Sciences, non-governmental analytical centers and mass media. A great interest in these discussions was revealed by the IAEA, EC, state authorities and NGOs representing Sweden, Finland, Great Britain and U.S. It is not coincidence that the majority of participants took part in the both events. Actually, interconnection between them was clearly formulated by one of the foreign participants in the epigrammatic statement: "Transparency – it is reputation, and reputation – it is investments". In other words, enhancing the role of civil society ensures more transparency in state authorities' activities, their responsibilities and reliability, and this, in its turn, creates favorable conditions for the foreign investments, including those in the security sector. A lot of participants expressed their opinions that the fresh impetus on the route of solving the problems of WMD nonproliferation regimes could be given due to development of civil society elements including specialized nongovernmental analytical, research and training centers, print and electron media, etc.

Besides, when closing the second-day discussion, it was Ukrainians' pleasure to hear from the foreign participants about the ***absolutely free exchange of ideas occurred,*** that was impossible previously. And we hope, this is the best guarantee that ultimately everything will be OK with Ukraine...

Sergiy Kondratov

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Lessons Learned From Chernobyl NPP Shelter Construction in 1986

Anatoly V. Nosovsky

Administrative approaches to "Object Shelter" erection

In the aftermath of the Accident Chernobyl NPP Unit 4 turned into a radiologically hazardous site that could by no means be considered a nuclear power plant any longer. Therefore, it was specialists of absolutely different expertise and qualifications from those of the NPP operating personnel that had to make all decisions on the destiny of the Unit and on occupational radiation safety assurance, and to implement them.

The work to bury Chernobyl NPP Unit 4 and adjacent facilities was assigned to the USSR Ministry of Medium Machine-Building (MMB), headed by E. Slavsky. In late May 1986, an ad hoc construction department (UB-605) was established within the Ministry to carry out construction work, which consisted of a few construction and assembly units; concrete manufacturing plants; mechanical engineering, automobile transport and power supply units. The majority of other organizations and agencies involved in the accident mitigation were responsible for decontaminating the area around Chernobyl NPP.

18 options of a confining structure were considered at the conceptual design stage [1]. Out of all options proposed for confinement of the wrecked unit, a design outline developed by experts of the design institute VNIPIET[1] was accepted as the basis and that design institute was appointed General Designer of the "Object Shelter". They managed to complete the design of the facility within three months from 20 May through 20 August 1986. As parts of the design were ready the designer team transmitted the documentation to UB-605 workers and eventually adjusted or supplemented it as necessary. The Kurchatov Atomic Energy Institute was put in charge of scientific supervision over these activities.

As Object Shelter was being erected the arrangement for minimized losses underlying the concept of optimum active impact on radiation situation was implemented in the following succession:

- Identify the structure of dose fields formation at workplaces and detect radioactive sources subject to suppression during accident mitigation;
- Plan construction and restoration activities stagewise, factoring in their succession, exposure level, and number of personnel. The prioritization of activities was supposed to make sure the radiation field levels at workplaces are made lower as soon as possible before completing next stages. The construction of each "Shelter" element started from the most hazardous activities in order to perform the activities to follow under protection by this element;
- Develop a comprehensive work strategy, specifically in terms of engineering support, counter-radiation measures, monitoring of exposure doses from major radioactive sources, visual monitoring, etc.;
- Establish a construction work procedure and action plan for experts responsible for radiation safety of construction worker teams at each worksite.

The main task at the initial stage of Object Shelter construction was to suppress high-capacity local sources on-site: fuel rod elements, graphite stack and other construction materials of the wrecked reactor. Contaminated soil and radioactive materials were collected into containers using special protected equipment. The measures taken resulted in reducing the exposure dose

[1] Russian Design and Research Institute for Complex Energy Technology (Saint Petersburg)

rate onsite by 5–30 times [2]. Afterwards, partition walls were erected to separate the damaged Unit 4 from Unit 3, as well as ferroconcrete protective walls along Unit 4 perimeter to ensure construction and assembly work safety. The Northern Wall was made of concrete in the format of cascades up to 12m high. Each next cascade was built ever closer to the wrecked unit.

The Object Shelter construction used technologies applicable for erecting high-strength concrete and concrete-block structures at hard-to-reach locations:

- Remote concrete form pumping and compacting, producing high-strength monolithic concrete;
- High-pressure streaming supply of special-thickness concrete with special viscous additives and low on coarse fillers.

As Object Shelter was being erected the nuclear fuel contained in the reactor debris was substantially affected: concrete got inside the premises; the wrecked reactor structures and structural elements further relocated; the natural cooling regime changed, etc. Therefore, throughout the Object Shelter erection, Kurchatov Institute specialists performed intense diagnostical work inside Unit 4 [3].

The approaches applied to the Object Shelter erection yielded a manifold gain in construction costs and schedule. Six months passed from decision-making on facility construction to construction completion. The Object Shelter construction was completed in November 1986 and on 30 November 1986 the State Commission accepted the confined Chernobyl NPP Unit 4 for maintenance.

A large contingent of people was involved in the Object Shelter erection under very difficult, extreme conditions of high-level radiation, radioactive contamination of the territory and airborne. The USSR MMB recruited highly skilled specialists from the nuclear fuel cycle and nuclear weapons complex, as well as from MMB's construction industry enterprises, whereas no specialist from Ministry of Energy enterprises and nuclear power plants was involved.

The Dosimetry Monitoring Unit responsible for Object Shelter construction work safety was one of key UB-605 subdivisions. The Unit was staffed with skilled specialists from MMB's enterprises. The total number of workers varied at times from 150 to 270 persons. Those specialists made arrangements for and performed radiation monitoring throughout the entire period of hazardous work performance by UB-605 personnel, including individual dosimetry, post-operational accounting for dose intakes during each work appearance, radiological situation both at construction sites and locations of personnel rest, residence, and food intake.

Positive experience of radiation protection assurance during Object Shelter construction

Implementation of design solutions during Object Shelter construction in a difficult radiological situation required a set of administrative and engineering measures for occupational radiation protection:

- use of remote-controlled construction equipment and machinery including radio-controlled ones. A central operative post was created to control the assembly process, which was connected to remotely movable TV cameras mounted immediately on lifting crane arms, and special watchtowers installed at spots of maximum sweep. Similarly, work at locations of high exposure levels was organized, aided by TV monitors and two-way loud-speaker communications;
- use of special concrete work technology based on remote-controlled concrete pumping equipment;

- use of various radiation-protected cabs, mechanisms and shields (with exposure protection ratios ranging from 5 to 3000) for work in fields of high-level ionizing radiation. Protective shields were designed and manufactured on the spot out of flat lead and lead glass. Special transportable armoured cabs, so-called "bathyscaphes", were devised to perform work or visually monitor its progress at locations where irradiation was over 100 cGy per hour, which were hung on lifting crane arms and had a protection ratio of up to 2000;
- use of special technology and engineering means for mechanical decontamination of Chernobyl NPP territory and facilities. The main part of the territory around the wrecked unit was decontaminated by removing radioactive material and skimming the contaminated layer of surface soil. At some places dust was removed by means of special facilities. Local sources were suppressed by macadam filling and concreting. Most radioactive elements were loaded into containers during territory decontamination and placed into the reactor debris for burial inside the Object Shelter being under construction. The skimmed soil and other radioactive materials were transported to ad hoc temporary disposal facilities;
- use for decontamination work of fencing machines with grabs on remote arms and bulldozer blades, radio-controlled bulldozers, frontal loaders and other road-building equipment protected against operator workplace exposure, air-filtering facilities, remote monitoring instrumentation and radio communications. For decontamination of contaminated roofs robotized remote-controlled mechanisms were used as well as radiation-protected mini-tractors equipped with bulldozer blades, millers or grabs;
- use for assembly work of high-capacity lifting cranes equipped with TV cameras and enabling assembly of structural elements of up to 160 t on crane arms of up to 50 m.

For the period of ChNPP accident mitigation work the USSR Ministry of Health Protection established the cumulative individual external exposure dose limit at 25 cSv[2] throughout the entire work period [4]. Once the cumulative individual external exposure dose limit was reached, the worker was dismissed from work within the Chernobyl NPP zone and sent for medical observation.

For UB-605 personnel the reference level of external exposure was set at 10 cSv, and whenever it was reached the worker was evacuated from the high-level radiation area and sent to perform auxiliary work beyond the radioactively contaminated area [5].

The reference level for one-time exposure was established as well. Based on analysis of actual radiation situation at personnel workplaces, this value had to be set at 1 cSv per day. The maximum permissible daily exposure dose was set at 2 cSv with mandatory dismissal of the worker exposed to such a dose from radiation-hazardous work for a few days [4]. Such was the fundamental position held by UB-605 professionals in those adverse times when any reasonable decisions to prevent unwarranted personnel exposure were considered by some officials as sabotage.

The establishment of reference levels for occupational exposure and their practical implementation displeased the construction workers. Yet, despite that, all those radiation safety requirements were strictly met. Violators of radiation safety rules were dismissed from work, their mission was terminated, and they were sent back to their enterprises.

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[2] 1 centiSievert = 10^{-2} Sievert (Sievert is a measurement unit of effective and equivalent exposure dose in SI). – *Edit.*

All workers involved in Object Shelter construction were required to undergo medical examination and training in radiation safety, personal hygiene, protection means and rules of their application. The workers were provided with basic uniform, shoes and individual protection gear. In addition, irrespective of work conditions and nature, they were equipped with additional protection gear: leaded aprons, belts, eyewear as well as elastron uniform, gloves, shoe covers, gas masks, insulating respiratory systems and suits. Whenever radioactively contaminated, the uniform, underwear, shoes and other individual protection means were sent for decontamination or, depending on level of radioactive contamination, thrown into radioactive waste and taken to burial sites [6].

A sanitary check-point regime was established that required changing of clothes, sanitary treatment and mandatory radiation monitoring of personnel upon exit from contamination areas into clean ones. Upon entrance into dining rooms and residential zones dosimetry posts permanently functioned to monitor contamination of hands, clothing, shoes; and devices for skin decontamination were installed.

All work in the area of the wrecked Unit was performed only after radiation situation monitoring, identification of major radiation sources and establishment of safe work procedures. In the most radiation-hazardous areas work was done under access permits and post-operational dosimetry monitoring. Occupational exposure doses were reduced by limiting the stay under radiation-hazardous conditions, remote performance of technological operations, and use of protective shields. In addition to remote-controlled mechanisms, wide use was made of instruments and devices keeping humans at a distance from local radioactive sources (claws, grabs, manipulators, extended handles).

TV camera units were used for visual remote monitoring of the process of assembling structures and floors and of concreting quality and process, for examination of destroyed structures, removal of high-level radioactive sources, and other work performed under radiation-hazardous conditions. The use of TV camera units played a major role in reducing dose loads of personnel who had to stay 12 hours onsite.

It is the involvement of highly qualified personnel that was key to successful performance of Object Shelter construction work under such a tight schedule. UB-605 management and specialists summoned from nuclear fuel cycle enterprises and nuclear weapons complex were experienced in erecting nuclear facilities for various purposes, well-versed in quality assurance and radiation safety during construction of such facilities; quite a few had experience of involvement in nuclear weapon tests – absolutely indispensable when mitigating radiation accident consequences. The experience and adequate qualification of UB-605 specialists became that critical component without which successful ChNPP Accident mitigation would have been just impossible.

When performing hazardous work, the basic radiation safety principles were practically implemented based on the strictest discipline and promptly developed and introduced guidance and procedures for all radiation-hazardous work.

All specialists arriving for service with UB-605 were signed on only according to qualifications required for specific work. They were put on time-keeping and dosimetry register with mandatory submittal of medical examination certificates, received mandatory guidance and observed uniform labour discipline and radiation safety requirements.

A combination of appropriate work organization, use of remote construction work technology, best arrangements for radiation monitoring and radiation protection of humans and equipment, as well as use of qualified personnel enabled successful completion of the entire scope of planned work to create a shelter for the wrecked unit under a tight schedule and avoiding over-exposure of personnel. A review of exposure doses related to Object Shelter construction[7] yields conclusions as follows:

- over 50% of personnel were exposed to a dose of 1 to 5 cSv;
- 0,6% (155 persons) of the total number of workers were exposed to a dose of over 25 cSv.
- the maximum exposure dose amounted to 49,2 cSv.

All Object Shelter construction work was done by the UB-605 team totaling 21 545 persons. That included all military men involved in the construction. Those were strictly called-in reservists with civil engineering expertise, aged 35–45. The UB-605 management strongly refused to involve young soldiers on involuntary service and none but those 21 545 persons were directly involved in the Object Shelter construction [8].

The average individual external exposure dose was 8,7 cSv against the then permissible dose of 25 cSv. Therefore, in 1986 the UB-605 management ensured that work was completed not only as scheduled, but also with individual occupational exposure dose values comparable to those established by safety rules and norms.

Over-exposure beyond 25 cSv was recorded in 155 persons of UB-605 workers – predominantly in highly skilled specialists and MMB and UB-605 managers who often had none to replace them and had to work a few shifts in a row. Oftentimes, as the managers believed that they had no right to send their subordinates to most hazardous locations they personally ventured on engineering and radiation surveys of hazardous spots to ensure further work organization and develop counter-radiation measures.

Considering the Object Shelter construction practice, the restoration of Chernobyl NPP Unit 3 and its preparation for commissioning in January 1987 were also assigned to UB-605 specialists and completed on schedule as established. Occupational exposure doses of UB-605 personnel related to this work were much lower than those in 1986. Hence it can be confidently stated that UB-605 management had created conditions for safe performance of all assigned work on schedule as established and with occupational exposure doses within the regulatory limits.

Radiation protection and work organization concerns during ChNPP Accident mitigation

The work to mitigate the accident consequences involved about 600 thousand individuals, 240 thousand military men in particular [9]. The main task for the majority of accident liquidators under this category was decontamination work. Average values of effective external exposure doses for this category were 17 cSv in 1986 and 13 cSv in 1987 [7]. Therefore, average exposure dose values for most liquidators of 1986–1987 who were not part of UB-605 units ended up two and more times higher than the doses that UB-605 workers were exposed to during Object Shelter construction and Chernobyl NPP Unit 3 restoration, and that being the case while UB-605 specialists performed actually the most radiation-hazardous highest dose-rated work of 1986 and 1987.

Far from disregarding all that done by organizations not part of UB-605, it can, however, be stated that much of this hazardous work was not an imperative must. Most radiation-hazardous work within the 30-kilometre zone of no direct relevance for Unit 4 containment were not urgent and could have been done after the radiation situation became normal, to avoid unwarranted occupational exposure.

90% of the cumulative dose for all liquidators is in no way commensurate with the nature, scope or significance of the ChNPP Accident mitigation work they did. The main reason for this is neglecting the established safety requirements. Lack of radiation safety competence in remedying the accident played a major negative role during the active mitigation stage.

Immediately after the accident, quite a few senior positions responsible for accident mitigation were occupied by individuals who lacked professional qualifications for that business. Many of

them exhibited dedication and personal courage in trying to mitigate the accident consequences and were exposed to high exposure doses. But it soon became clear that their efforts had been ineffective. It is not their fault, but it was then imperative to give due credit to all those who had done their job for the first couple of weeks after the accident but reduce their competence to power unit operation and evacuate redundant personnel from the emergency work area. As for handling the emergency and its consequences, this activity should have been performed by managers with expertise in this area. Unfortunately, the operative work controls at the very beginning were given to individuals very poorly prepared for the mission. This can explain the huge number of erroneous assessments then made of both quantitative accident characteristics and of major potential hazards associated with mitigating its consequences.

The emergency work onsite was primarily handled by NPP operators, most of which were good at operation but ignorant of radiation accident mitigation. Their incompetence resulted in their attempts to do the job whatever the cost, be it to neglect the radiation safety rules. Many managers believed defying radiation safety rules during ChNPP accident mitigation to be a sign of heroism, but it was not vital.

A vivid example of extremely radiation-hazardous yet absolutely unwarranted work for the initial mitigation stage are the efforts to decontaminate the roofs of the turbine hall and auxiliary facilities of Chernobyl NPP Unit 3. The military men involved in those efforts were exposed to extremely high gamma-radiation fields primarily due not to the contamination of the roofs, but to the radiation from very powerful sources, of which the main one was the wrecked reactor. It was nothing but a crime to send young regular soldiers to do that absolutely futile job yet before the main sources were suppressed.

Such work was normally initiated by a radiation survey team established under the Governmental Commission and mainly consisting of persons largely ignorant of radiation protection fundamentals and techniques of work under radiation conditions [8]. This team actually did not report to the ChNPP management and as the main remedial work was gradually transferred to MMB, it constantly changed its administrative arrangement, trying to remain independent and under no control in handling large material resources. This team's main efforts were focused on recruiting volunteers out of regular servicemen based on promises of soon-to-follow demobilization and sending them to hazardous sites, reporting afterwards to the Governmental Commission that an important task has been accomplished. The flagrant fact of flying the flag on the ventilation shaft VT-2 in November 1986, resulting in military men being exposed to high doses, had also been planned by the radiation survey team.

The UB-605 management repeatedly had to stop construction work at Unit 4 locations which had been absolutely clean in terms of radiation the previous day, but on the next day already had high levels of radioactive contamination. The appearance of radioactive contamination at places where it had not been and must not have been has a very simple explanation – as ordered by incompetent leadership, military men performed decontamination of roofs at higher elevations by throwing the radioactive material down.

In autumn 1986, a decision was made to accept Chernobyl NPP construction work in a step-by-step manner, yet before the whole scope of work is finished. Numerous observers and examiners showed up onsite, who imposed on Object Shelter premises unjustified requirements established for intact power units. Purely absurd directives were issued at times such as that to decontaminate a newly erected partition wall. Lack of professionalism was a telling sign when fire safety inspectors demanded a transfer of the smoking area from indoors to outdoors where the radiological situation was hundreds of times in excess of the permissible levels. Another ill-qualified initiative was to introduce inspection of UB-605 concrete-manufacturing plants in autumn 1986 in order to prevent theft of concrete mix. Indeed, there was more concrete spent than was provided for by Object Shelter design documentation because during the cascade wall

assembly a great deal of concrete leaked into the wrecked unit through cracks and openings caused by the accident.

In contrast, the strong refusal of the UB-605 management to comply with absurd demands and send construction worker teams to do pointless jobs incapable of improving the radiological situation in radiation-hazardous areas made sure the total collective dose for UB-605 workers remained at an optimum justified level.

The huge number of idle liquidators in the 30-kilometre zone was a major negative factor for radiation safety assurance, but it was the fault of the management who initially brought a multitude of people into the emergency area without having prepared a proper scope of work for them while having them incur unwarranted exposure.

Summary

Ukrainians continue to be concerned about the status of Object Shelter transformation into an environmentally safe system. Pursuant to the memorandum on Chernobyl NPP shutdown, the international community committed to provide financial aid to Ukraine so that the challenge of ensuring Object Shelter environmental safety would be appropriately addressed.

More than 8 years have passed since the Supreme Council of Ukraine ratified the agreement between the government of Ukraine and the European Bank for Reconstruction and Development on funding terms for Shelter Object activities, but the main bulk of the allocated funding was spent on preparing justifications, concepts, programs, and maintenance of Western specialists and experts. Sadly, not much has been done in reality. The original baseline schedule was totally frustrated. The main reasons are poor-quality project management based on lack of professionalism and apparent personal lucre of certain officials.

It took UB-605 workers only *six months* in 1986 to design and construct a confinement for the wrecked reactor under extreme radiological conditions, which ensured reliable protection and operation of the remaining Chernobyl NPP units for a lengthy period. And it took the entire international community *eight years* only to create a conceptual design of Object Shelter transformation into an environmentally safe system and even that design is in want of substantial elaboration. Such performance is another proof that projects of this kind should be the responsibility of professionals. The bottom-line is that the first priority in this matter should be given to involving highly qualified and richly experienced specialists directly interested in reaching the ultimate goal and upholding Ukrainian national interests.

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Ukraine in a Maze of Uncertainty between NATO and RUSSIA

Grygoriy Perepelitsya

The Riga NATO summit held in November 2006 seems to be the first event of this level that Ukraine failed to attend. This is quite a telling sign, considering that it was a summit that intended to get Ukraine involved in the NATO Membership Action Plan (MAP). No high-ranked official available for this summit is the second proof of Ukraine's further departure from its Euro-Atlantic integration course.

The first clear enough message on a change in the country's foreign policy was uttered by Premier-Minister Viktor Yanukovych on his visit to Brussels in September 2006 where he outlined three cornerstones. First, Ukraine is not ready to sign MAP since NATO membership must be decided by a Ukrainian national referendum. Second, the subject of membership should be divorced from that of cooperation and the latter should be further developed rather than speculating about the former. Third, our Euro-Atlantic integration ambitions will deadlock Russia in terms of its relations with NATO and EU. In other words we are unwilling to implement our Euro-Atlantic course because this is something unacceptable for Russia (not being an Alliance member though).

After the Riga Summit a similar message came from the President of Ukraine, Viktor Yushchenko, though not verbally but in his decision to go to the Minsk CIS Summit instead of Riga. And in this respect Viktor Yanukovych was right when he assured the U.S. that he and President Yushchenko had no variance as to Ukraine's foreign policy course. Such unanimosity seems to be determined by the Russia factor. In order to understand why the hand of Ukraine's foreign and security policy vacillates from one direction to another, one must appreciate the role that NATO and Russia have played in the formation of European security environment for the last fifteen years after the Cold War and what the NATO/Russia relations have become as a result.

During the Cold War NATO was an important component of the bipolar international security system. Such a system maintained stability due to a balance of forces between two socio-political systems of the NATO Alliance and of Warsaw Pact. While the principal threat for European countries under such a bipolar security system was that of a war between NATO and Warsaw Pact, capable of destroying the entire European civilization; the very existence of such a reciprocal threat, however, was to a certain extent a pledge of stability and peace in the relationship between the two Alliances.

Maintaining the strategic balance of forces boosted the arms race that was a heavy burden on the economy and finances of the leading countries parties to the Alliance. Maintaining such a strategic balance brought about competition in economy and social fabric of the two socio-political systems. It was a viability competition.

It was NATO that triumphed in that competition, proving its effectiveness and viability. Hence NATO successfully fulfilled its purpose and functions throughout the Cold War. The victory of the Euro-Atlantic collective security system in the global standoff yielded NATO enormous geopolitical, military, political, and ideological dividends. NATO's key geopolitical trophies from the Cold War must include: the unification of Germany; dissolution of the Warsaw Pact; breakup of the USSR; Russia's geopolitical collapse; and an independent Ukraine.

The triumph in the Cold War brought NATO immense military-strategic advantages. These advantages primarily refer to ending the global standoff and the arms race, which substantially strengthened the Alliance members' military security. The end of the Cold War brought far-

reaching reductions in the amount of conventional arms in Europe, which resulted in the Alliance gaining a threefold preponderance in its correlation of forces with Russia[1].

The USSR, and afterwards Russia, evacuated its troops from Eastern Germany, Central Europe, and the Baltic countries. A buffer zone emerged between Russia and NATO as a result of such a geopolitical retreat of Russia from Europe. This buffer zone is now made up of the so called "near-abroad" countries on post-Soviet terrain.

And finally, the end of the Cold War resulted in the signing of basic treaties on conventional arms control and military transparency. Thus an international legal mechanism to maintain military-strategic stability and military security in Europe was created. All those military advantages gained by NATO altogether meant that global military threat from the East was no longer there for NATO.

The fall of the Communist regimes in those countries caused internal political instability. The young democracies that had replaced the Communist power in those countries were weak and in need of civil society support. Therefore, those countries felt like realigning. The North Atlantic Alliance was looking up a new role for itself in those countries, which consisted in ensuring military-political and political stability in Central and Eastern Europe and strengthening democratic regimes in this European region.

A security vacuum also emerged as a result of eroded boundaries and limits of security responsibilities held by leading European countries and international organizations on the European continent. These new security threats were manifest in internal conflicts, trafficking in drugs, uncontrolled illegal migration of people, fugitives, terrorism, and spread of weapons of mass destruction and missile technology.

Therefore, no organization other than NATO was available in Europe that would be capable to cope with the security challenges posed by the new era. Ukraine, however, could not rely on NATO support in addressing its national security problems during the first years of its independence. Both the Alliance and the U.S. implemented a policy of "Russocentrism" with respect to countries of CIS and Eastern Europe. Under such a policy NATO's interests favoured Russia, especially in matters concerning Ukraine's nuclear disarmament. It is then not accidental that Ukraine's first conscious interest in NATO emerged in the nuclear disarmament process. It consisted in a want of additional security assurances to be extended to Ukraine as a non-nuclear-weapon state by both Russia and NATO countries.

Another essentially new period of Ukraine/NATO relations began in 1994. It was shaped up by a few factors: the beginning of NATO enlargement eastward, Leonid Kuchma assuming presidential power in Ukraine, aggravation of differences in Ukraine/Russia relations, a rise in revanchist sentiments in Russia and a revival of hegemonic tendencies in Russian foreign policy.

Since Alliance members reaffirmed at the Brussels January 1994 Summit their willingness and openness to admit new countries into the organization, a trend became clear for tensions to grow in NATO/Russian relations. This happened after the parliamentary elections of December 1993 when the democratic forces left the corridors of Russian state power. The growing tension between NATO and Russia had new threats ready for Ukraine.

The foreign policy fundamentals and the Declaration on State Sovereignty of Ukraine identified integration into Europe as the main strategic goal. Its implementation strategy consisted in Ukraine heading for Europe hand-in-hand with Russia. Therefore, Ukraine underscored the need in a comprehensive European security system, seeking to avoid creating new blocs and demarcation lines [2].

Based on such a belief, Ukraine stood for NATO transformation from a collective defense organization into a collective security one, to include both Ukraine and Russia together with

other European countries. Such an understanding was largely in line with Russia's position in this matter and also respected NATO's "Russocentrism".

Alliance enlargement and Russia's opposition to that process created a threat that new demarcation lines would appear and Ukrainian territory would turn into a "buffer zone". Furthermore, should Russia and NATO resume the military confrontation, Ukraine might become a likely war arena. Such threatening prospects initially made Ukrainian President L.Kuchma skeptical about NATO enlargement, and he voiced that skepticism during his visit to the U.S. in November 1994[3]. Yet, the bottom-line was not *if* the Alliance will be enlarged, but *how* it will be enlarged. The concept of enlargement by strengthening political stability helped avoid the concerns discussed above.

The main conditions for enlargement included: priority to NATO's political interests over military-strategic ones, reaching a compromise with Russia, implementing a broad security cooperation programme entitled *Partnership for Peace*, compliance of new candidates with the Alliance's political requirements. NATO's requirements to those willing to enter the organization included availability of democratic controls over armed forces, absence of territorial claims to neighbours and settling these problems by political means only, and absence of ethnical conflicts within the country [4].

All those conditions proved to be quite positive for Ukraine's security. They helped Ukraine uphold its border security interests and settle its territorial disputes with Rumania and Poland. The Declaration on Reconciliation between Poland and Ukraine and Treaty of Friendship with Rumania followed accordingly.

How did Ukraine benefit from the compromise reached between NATO and Russia? It helped prevent new demarcation lines in Europe. But the most important thing is that, with NATO support, Ukraine, managed to conclude the Treaty on Friendship, Cooperation and Partnership between Ukraine and the Russian Federation, in which Russia respects the territorial integrity, independence, and inviolability of Ukrainian borders [5].

Yet Ukraine itself played a major role in reaching the NATO/Russia compromise. Its posture towards Alliance enlargement took into consideration not only NATO interests, but also those of Russia. It was based on the following principles:

- NATO enlargement must be evolutionary;
- no State has a privilege to veto other States' membership of the Alliance;
- NATO ought to be transformed into a broader Euro-Atlantic security organization;
- The Alliance's function of collective defense ought to be replaced with that of collective security;
- No nuclear weapons must be deployed on the territory of new NATO members;
- NATO enlargement ought to respect both Ukraine's and Russia's interests [6].

Assuming such a position, Ukraine actually paved the way for conflict-free NATO enlargement eastward, which took it a minimum of financial and military costs. It was the thing that first made the Alliance admit that Ukraine was playing a "key role in establishing stability and security in Europe"[7].

Nevertheless, unlike its Western neighbours in Europe, Ukraine did not officially apply for NATO membership. Ukraine was inwardly unprepared for NATO membership, Ukrainian society lacking consensus on NATO. The democratic regime in the country then featured no stability and Ukraine failed to meet most NATO membership criteria.

The list of extremely serious foreign concerns must have included incompleteness of international legal paperwork to legalize the State Border on Russia and Russian military

presence on Ukrainian territory. Neither did NATO haste to assume obligations with respect to Ukraine under Washington Treaty Article 5. Meeting its allied engagements before Ukraine would pose for the Alliance, in the opinion of its leadership, a major military-strategic and military-political problem primarily due to escalated tensions with Russia. The key Alliance members' economic interests with respect to Ukraine were then very vague.

Therefore, NATO's unpreparedness together with Ukraine's diffidence that its membership application would be satisfied led the parties to work out a "special" form of relationship between them. This "special" Ukraine/NATO relationship was officially formalized as the two parties signed the NATO-Ukraine Special Partnership Charter on 9 July 1997 in Madrid. NATO Secretary General George Robinson spelled NATO's willingness to help Ukraine "outline its own special way into the new Europe" during his visit to Kyiv in January 2000[8]. One important principle of special partnership is to secure a provision that Ukraine cannot be considered as a sphere of influence by another State. The purpose of special relationship development is to develop democratic institutes, implement radical economic reforms and integrate Ukraine into all European and Euro-Altantic organizations.

But despite all cooperation opportunities under special partnership, after the NATO Air Force bombed the sovereign United Republic of Yugoslavia and 1999 presidential elections, Ukraine began to gradually depart from the process of integration into the European security structure. Official statements by the leadership that it was neither currently nor prospectively going to join NATO and further military agreements concluded with the Russian Federation demonstrated a substantial adjustment in Ukraine's military policy towards NATO. This adjustment primarily respected the strategic interests and official position of Russia in its relationship with NATO. It is in the context of those interests that Ukraine became less sympathetic with the NATO policy in the settling of the Balkan conflict. Overtly anti-NATO footages appeared on Ukrainian TV. Such a trend made the NATO image being then at a rather low level even less uninviting in the eyes of Ukrainian public. A 2001 poll showed that the number of those perceiving NATO as an aggressive bloc had grown from 46% in 2000 to 48% [9]. Such a negative perception of NATO by Ukrainian people is largely due to the fact that Ukraine is under nearly total domination by Russian media that treat NATO in the explicit negative.

As President L. Kuchma declared a course towards market reforms and democratic transformations in the country he encountered serious challenges to its implementation [10]. The country sleep-walking into a state of economic chaos in the 1990s weakened Western support and strengthened Russia's pressure on Ukraine to get reintegrated into the Russian Federation and CIS entities[11]. Under a State Budget deficit it proved impossible to keep the defense complex and armed forces at a proper level. The defense sector found itself badly in need of reform. All those external and internal circumstances eventually made Ukrainian establishment realize that a departure from the European choice or a slow-down in European integration is a challenge to Ukraine's existence as a democratic State.

Once such a threatening prospect is realized, it warrants forming a system of Ukraine's long-term strategic interests with respect to NATO, which lie in such areas as geopolitics, security and defense, economy, foreign and domestic policy.

Ukraine's geopolitical interests in NATO are driven by the role of the Alliance as a geopolitical power of essential and sometimes even decisive sway over international processes and events happening on the European Continent. No country or organization is able to rival the Alliance's defense and security potential.

For Ukraine this influence became particularly felt as NATO began to enlarge eastward and the international programme *Partnership for Peace* was launched. Considering the factor of NATO as a geopolitical power, Ukraine refers to its cooperation with it as an alternative to military-political reintegration with Russia. Therefore, its geopolitical interest in the Alliance was primarily determined by Russia's geopolitical ambitions. As it is known, to restore the

geopolitical influence on Europe by Russia as a self-standing geopolitical center is impossible without reintegrating Ukraine into the womb of Russian statehood. A geopolitical project for a new Europe most acceptable for Moscow is that of two empires: the West (EU) and Russia. Ukraine failing to join, Russia's geopolitical weight in Europe seems insufficient to carry the project through. Under a strong Russian pressure, Ukraine considered NATO to be sort of a balancer in its relations with Russia, which would keep Moscow's geopolitical ambitions at bay.

Such an interest in NATO perfectly fit the so-called multiple-vector (or two-vector, rather) foreign policy pursued by L. Kuchma. It consisted in balancing between NATO interests and those of Russia, which envisaged the same level of Ukraine's military cooperation with both the Alliance and the Russian federation. Such a policy somewhat helped maneuvering between the requirements of those two geopolitical powers and gain certain foreign-policy dividends as a result. At the same time it made it impossible for Ukraine either to join the Alliance or conclude defense treaties with Russia or gain membership of the Collective Security Treaty Organization (CSTO). Such a policy is most productive whenever there is a parity of interests between two powers.

It is worth mentioning that the balancing policy sinks in effectiveness during a drastic escalation or, on the contrary, a drastic alleviation of conflicts between two political powers. In a period of confrontation they require their partner to assume an alternative-free position based on the "with me or against me" principle and identify it accordingly as a "ally" or as "adversary". Room for balancing in such confrontation periods is reduced to a minimum.

The policy of balancing becomes counterproductive in cases when interests of two geopolitical powers match. Such a concordance of Russia's and NATO's interests at a global level emerged after September 11, 2001**.** The Alliance's strategic concept underscores that "Russia plays a special role in the Euro-Atlantic security system"[12]. This role would consist in: first, to ensure conflict-free NATO enlargement; second, accept Ukraine's independent existence; and third, to serve as a powerful factor of stability in Europe.

Russia is undoubtedly within the range of NATO's interests. NATO's military interest with respect to Russia consists in avoiding a new conflict, preserving peace in Europe, and largely reducing the arsenal of nuclear and conventional arms. NATO's political interests with respect to Russia were associated with its internal domestic transformations [13]. Through democratic transformations the West sought to strip Russia of imperial ambitions and involve it in the addressing of Euro-Atlantic security concerns. A democratic Russia was supposed to ensure stability on the entire post-Soviet terrain.

Therefore, NATO's relationship with new post-Soviet countries needed to be built factoring in Russia's interests. Such a policy of the West was labeled a policy of Russocentrism. However, this policy was a mistake. Democratic reform failed in Russia. Instead of a democratic one, an authoritarian regime was eventually restored in Russia. Instead of a policy aimed at strengthening stability on the post-Soviet terrain, Russia resumed the policy of geopolitical revanche. This reality forced NATO to abandon its political projects with respect to Russia. It is military-political issues of Russia/NATO cooperation only that are still of relevance. It is the Alliance's security interests with respect to Russia that the new NATO strategic concept focuses on.

NATO develops with Russia "an extensive dialogue on such matters as disarmament and arms control, including the adaptation of the CFE Treaty; peacekeeping and nuclear weapons issues"[14]. NATO's main purpose currently is to preclude threats to Euro-Atlantic security coming from Russia. To that effect the strategic concept indicates that "NATO and Russia have committed themselves to developing their relations on the basis of common interest, reciprocity and transparency to achieve a lasting and inclusive peace in the Euro-Atlantic area [15]. This type of relations was stipulated in the Founding Act on Mutual Relations, Cooperation and Security between NATO and the Russian Federation signed 27 May 1997 in Paris.

Although it is a common practice to treat the NATO-Russia Founding Act and NATO-Ukraine Special Partnership Charter in a package, they represent two essentially different documents, however.

They set forth different levels of relationship. In the Founding Act the parties refused to perceive each other as military adversaries. Nevertheless it does not exclude military or geopolitical competition between them. The Founding Act refers to relations existing somewhere between competition and partnership. Partnership is supposed to be developed to solve general security problems. In the meantime a regional competition is not ruled out.

The NATO-Ukraine Special Partnership Charter stipulates relations at a level between those of partners and those of allies. The principal thing for Ukraine/NATO relationship is political interests of the parties. Russia/NATO relationship is primarily based on mutual military and military-political interests. The special relations between Ukraine and NATO are basically aimed at domestic transformations within the parties. In this connection the parties make explicit mutual commitments. The Founding Act does not envisage such commitments. The mechanism to implement these relations does not concern Russia's or NATO's domestic affairs [16]. Nor can it be used to compromise interests of other countries.

While the main purpose of Russia-NATO relations is to build up sustained peace in Europe, the key objective for the special relationship between Ukraine and NATO is Ukraine's integration into Europe and Euro-Altantic security structure. Therefore, the Charter establishes that Ukraine is part of Central Eastern Europe, i.e. the responsibility area of NATO rather than Russia.

Two different agencies are foreseen to implement these two types of relationship. Russia-NATO relations are the responsibility of the NATO-Russia Permanent Joint Council. The agency for Ukraine-NATO relations is the Ukraine-NATO Commission. Though both agencies are represented at the same level (both chaired by NATO Secretary General and membered by ambassadors and ministers), they play different roles. Ukraine-NATO Commission activities are of political nature. It is to assess Ukraine-NATO relations and further develop the integration process. The Permanent Joint Council was established to hold consultations and reach consensus between Russia and NATO on issues of military and military-political nature. Therefore, the Permanent Joint Council is primarily tasked with enhancing the dialogue between the NATO senior leadership and Russia at the Chief of Staff level.

A new milestone in NATO-Russia relations began in 2001. On the peak of war on global terrorism Russia was able to represent itself as a NATO and U.S. ally in the counter-terrorist campaign. Terrorism being a common threat ironed out some differences between Russia and NATO. A compromise over geopolitical interests between the two powers was reached at a global level. That compromise was embodied in the new format of "Twenty", under which Russia and the Alliance work on a parity basis, but this relationship covers only the area of mutual interest related to neutralizing such threats as global terrorism, spread of weapons of mass destruction, and man-caused or natural emergencies. Still, Russia cannot influence Alliance members' policy decision-making. Such a compromise between Russia and NATO became possible owing to the Russian President V. Putin's new policy that can be referred to as a policy of "political realism".

The Putin political realism is in realizing that Russian resources are limited and Russia cannot carry out its global geopolitical ambitions, and that it is counterproductive to carry on global confrontation or contention with the U.S. or NATO. V. Putin acknowledged the U.S. to be the only world leader whose interests would affect the way Russia would act and he relinquished the idea of overt opposition to NATO enlargement.

Yet, in exchange for such a compromise, V. Putin expects the U.S. and NATO:

- to "close their eyes" on the Chechnya war and recognize it a Russian internal affair;

- not to be preoccupied with the establishment of an authoritarian regime in Russia;
- acknowledge the CIS terrain a sphere of Russian influence only.

In what way did the format of "Twenty" allow to implement those ambitions of Moscow's? It gave Russia some options to influence NATO "from within" via a mechanism of consultations and to further such ambitions to a certain degree because there was no alternative to them. The path of explicit objections, threats, and ultimatums, as the first round of NATO enlargement eastward demonstrated, gave Russia no chance of success.

The accession of seven new countries to the Alliance enlarged NATO's main area of responsibility in Europe. And Slovak Republic and Slovenia actually acceded to fill the "gaps" that had emerged inside that area. However, the NATO leadership's main focus is on problems arising at the periphery of that area – on the forefront of enlargement. These problems are mainly due to Russia's sensitive response, security losses for countries left outside of the main area, and financial and political losses for the Alliance itself. If NATO enlargement is meant to enhance stability, then NATO is to avoid direct confrontation with Russia. Russian nuclear arsenal, resources, and geopolitical situation give all reasons to believe that the way NATO develops its relationship with Russia will substantially affect regional and global security.

In response to the second wave of Alliance enlargement, V. Putin again emphasized that "NATO enlargement across the former USSR borders would create a new situation for Russia. It would have extremely serious consequences for the entire security system on the European Continent." Later on, responding to a question if Russia would not mind joining NATO in the future, V. Putin answered: "Why not?"[17]. V. Putin claimed that he would be open to a deeper integration with NATO. In reality, however, the Putin policy is aimed at rectifying the skew in Russia/NATO relations and reaching an "equitable partnership".

Russia is apparently unable to alter the asymmetry in its security and defense relationship with NATO because of its inability to compete with the West in a new arms race. Therefore, the actual threat is posed by Russia to the West on a different plane – a threat coming from a potentially offended and beleaguered nation that could still create security problems for Western nations[18]. In order to reduce this threat arising from a new skew in NATO-Russia relations, the West will seek to deepen its economic cooperation with Russia.

Now that this country is not going to integrate into Europe and build a democratic society, but seeking to be a self-sufficient geopolitical power with its spheres of domination on the continent, it becomes evident that the process of Russia's opposition to and regional competition with NATO will continue. Assuming such tendency is maintained throughout the next decade, one can quite accurately forecast a scenario of how the situation will develop as far as Ukraine is concerned. Under such conditions, the most likely scenario for Ukraine is to turn into a "buffer zone". This scenario has already been implemented in part. Ukraine actually finds itself squeezed between NATO and the Belarus/Russia Military Union. The second wave of Alliance enlargement only intensified the features and contours of this "buffer zone". This scenario may be acceptable for the Alliance from a military perspective, since it does not require additional deployment of forces on the new members' territory and does not assume great expenditures to assure their defense and security. Yet, this scenario cannot satisfy NATO from a political perspective. First, it stalemates the process of further Alliance enlargement and second, it boosts authoritarian tendencies and political instability in Ukraine.

The thing is that Ukraine as a "buffer" may strengthen Euro-Altantic security only when being an internally politically stable country. The role of a buffer strips it of external conditions to secure such stability. Because of the second wave of NATO enlargement, Ukraine has lost the basic principle for implementing geopolitical interests – that of balance of forces. All Western and North-Western neighbours of Ukraine are now NATO members and security/defense relations with them are now determined by the total defense potential of Alliance Member States

rather than by bilateral co-relation of forces. In such a situation Ukraine will be unable on its own to withstand challenges likely to come from either geopolitical power.

Realization of such prospects shapes Ukraine's geopolitical interests in terms of its accession to the North Atlantic Alliance, since its accession to NATO secures it a strengthened national sovereignty and preserved independence and territorial integrity. Neither the Alliance, nor its members encroach upon these basic national interests while a Ukraine absorbed by Russia or becoming part of the latter will mean a complete loss of basic values for Ukrainian nation and disappearance of Ukraine as a sovereign State since Ukraine being sovereign contravenes Russia's vital geopolitical ambitions to restore itself as a continental geopolitical power.

The "buffer zone" situation uncertainty will provoke Russia to reclaim this territory that once was its part. With its military presence in this buffer zone, Russia will inevitably attempt to establish its political and economic domination in this country. While doing that, as Russia develops its relations with NATO it will seek to preclude Ukraine from close cooperation with the Alliance. Thus, Russian Defense Minister Sergei Ivanov told his Ukrainian colleagues during his 7 December 2006 visit to Kyiv about "negative consequences" of Ukraine's accession to the North Atlantic Alliance.

"The thing is not that Russia welcomes or not Ukraine's sovereign right to choose vectors for its security policy. It is up to Ukrainian people and Ukrainian elite to opt for cooperation with these structures," Ivanov said. "The point is that such steps will negatively affect the cooperation between the two countries," the Russian Minister added. According to Ivanov, "this step will willy-nilly affect our relations"[19]. In the meantime, at the NATO – Russia Council meeting held in Taormina, Sicily on 9-10 December 2006, Sergei Ivanov used a different reasoning to persuade its NATO colleagues that it would be inappropriate for the Alliance to extend its membership to Ukraine. Particularly, he referred to the threat of Ukraine's reorientation towards Western values.

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General trends to democratization of control system in the nuclear sphere

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"Internal" control system over "nuclear shield"

The technical-scientific revolution in the second half of 20th century has led to appearance of the nuclear weapons, which became the base of the wars of the fifth generation. Except atomic bombing of Japanese Hiroshima and Nagasaki at the end of the Second World War in August 1945, nuclear weapons, fortunately, was not used in war of the fifth (nuclear) generation and executed the role of better potential, rather than real power in bipolar opposition.

The History witnesses that in pre nuclear period practically all wars (more or less) were an instrument of politicians, which brought the politics all the way with power (for fon Clausewitz "formula"). But since the moment of its appearance nuclear weapons lost its purpose for which it was created. Even when it is used on purpose or as an accidental cause in limited amount or when only one nuclear ammunition is used in any war it will inevitably lead to general nuclear catastrophe and will ruin entire civilization.

And notwithstanding, main world players of past times (the countries-winners of the Second World War) taking into account high geopolitical competition tried to create own - comparably autonomous (self-dependent on own MIC facilities) "nuclear shields" - with closed secret system of the checking on it. Under such conditions there was natural increase in possibility of failure of internal (closed) systems of control of nuclear weapons (first of all because of human factor), which could lead to unpredictable consequences in global scale

The specialists acknowledge: «USSR, who conservatively referred to its nuclear potential, did not trust the control on this matter to military forces». In Soviet Union the control on Nuclear weapons was held directly by leaders of CPSU. **In China, nuclear missile power is based in the way that it is controlled by those persons and structures, which are differed by special loyalty to the State**. I will remind about dangerous examples - USA nuclear weapons were based in Greece, where the military upheaval took place and royal family was exiled. The USA nuclear weapons were located in Greece as well as in Turkey at that time, when both countries hardly have prevented the war through Cyprus".[3]

International regime of the control over the nuclear sphere

Commencing from XVIII century, the threat of the war spurred the States to begin the search for international mechanism of safety, but single attempts turned out to be not efficient enough, and found ways did not justify themselves under pressure from the sides of new pretenders to change the international balance of power to their benefits. However with appearance and further spreading of nuclear weapons such "restucturisation" became all more dangerous for the whole planet, and therefore it was extremely necessary to begin to make the universal international safety mechanism to maintain the level of national security and global stability at least in "nuclear" measures. This corresponded to general trend, for which "interstate relations, conflict of national interests, **solving of existing disputes always soon or later activate systems of**

[3] Shelling T. Weapons, that changed the world // New politics. – 2006.- December 4. (http://www.novopol.ru/article13741.html)

international organizations and international legitimate regimes of global, regional or sub-regional level". [4]

In general, international regimes are results of longings of the countries to be foreseen and to have long-term stability and safety in relations. Exactly this nudges the state to make the international regime network (as formal, so and informal) that regulates interaction in those spheres, where their interests coincide or do not contradict each other. In our context there is also significance, that one of the directions of western polytology (neo-realism) considers international regimes as independent factors of international relations and points them out as "principals, norms, rules and procedures of decision making, where there is concentration of expectation of main acting figures in this sphere".[5]

In its nuclear measurement, such mechanism, as hitherto pretends to be universal, became an international regime of non-proliferation of nuclear weapons, which is based on corresponding agreement (ANNW).

Signing of this agreement has nudged many states to fortification of the regime of the non-proliferation of the nuclear weapon on regional level. So, according to Raroton's Agreement South-Pacific region was proclaimed as nuclear-free zone, and according to Agreement Tlatelolko – Latin- American region was proclaimed as nuclear-free area as well. After South-African Republic [6] joining to ANNW this regime spread and on Africa, as it became the base for nuclear-free zone on this continent.

Besides this regime is not deprived of many principle problems, which greatly weaken its efficiency in question of the supervision of nuclear weapon.

First of all it is impossible not to take into account that main actors, who have take responsibility to take the control over performing the positions of ANNW, are nuclear states. And exactly they are carriers of ambition intentions to be the "leaders" of processes of the nuclear disarmament. Through this they usually ignore attempts of smaller states to do their donation into "ideology" of disarmament. So, in due course remained the unheeded attempt of Ukraine to initiate some directions in world and European (the idea of making the nuclear-free zone in Central and Eastern Europe in context of the process of the expansion of NATO to the east) process of nuclear disarmament, in spite of our practical experience in sphere of the nuclear disarmament.

Besides, there is paradoxical trend for tight integration into the regime of the non-proliferation of the nuclear disarmament not only of associations with double-sided process, but also with racing of the nuclear arms, which lasts at present time. The Paradox is that nuclear states simultaneously are leaders in nuclear race, and leading participant of the many-sided process of the non-proliferation and double-sided action of the disarmament.

The missiles of average range were based in West Europe considering interests of NATO defence strategy, giving Alliance political and military (moreover not only in nuclear, but in convention aspect as well) advantage. The Problem was concluded in that, that Europeans could not dispose the suspicions, which USA, placing in Europe its nuclear weapon, protected first of all its own interests, spreading the nuclear arms race on Europe. European motions were particularly disturbed by new USA doctrine about "attacking the defence at it depth". The suspicions were confirmed. Right before this became suitable for United State, they exceedingly

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[4] O.S. Bodruk. The Structures of military security: national and international aspects-K.:N_PMB, 2001

[5] O.S. Bodruk's quotation. The Structures of military security: national and international aspects-K:N_PMB, 2001

[6] SAR made its first nuclear device of primitive "cannon type" in 1979. Its TNT equaled only to about 3 kilotons. In 1989, at the moment of making decision about increasing its nuclear arsenal, SAR also owned 5 charges with total power of 10-18 kilotons

quickly have concluded American-Soviet agreement on average range missiles though separate specialists considered the present agreement as dangerous for Western Europe.

In our context it is also important that ANNW has defined only mechanism of "horizontal" (geographical) non-proliferation, not influencing "vertical" (within frames of states-holders) increasing nuclear arms. Hereupon states, which held nuclear weapons, have got the possibility for unlimited improvement and development of the weapons and its accumulation, remaining in this sense practically uncontrolled.

The experience of the bipolar opposition also witnesses that strategy of nuclear restrain, which dominated in it, also did not become the universal instrument of safety guarantee, since it was based on position of "unacceptable loss" in the event of using the nuclear weapons.

Nucleus restrain is efficient first of all comparatively to those countries, which have something to lose and which are built on basis of the democracy (in such countries possible human victims in consequence of using the nuclear weapons cause completely negative public reaction). As for "third world" countries restrain logic operates very poor, since there, human life has very low public-political value, and authoritarian elite by vastly smaller measure, than democratic, depends from population, majority of which does not even realize all of the possible effect of the nuclear conflict.

Considering modern conditions hereto follows to add also civilized (first of all religious) factors. The combination of these factors intensifies negative effects nuclear weapons holding. Particularly dangerous is (nuclear) opposition of "nuclear half-moon" [7] countries - from China to Middle and Near East, which have a greater number of the population, low level of living, comparatively weak systems of the public supervision on power and traditionally are in conflict between each other. In this sense transformation of India and more so Pakistan to nucleus countries has intensified the uncertainty of modern international social-political space safety.

In such situations there was a need for searching of other mechanism of supervision on "nuclear shield" on national-state level.

Social-political dimension of "nuclear shield" supervision problem

In scientifically theoretical plan this leads us to search for the answer to the question, for what society it is necessary to be aware of plan of the development and usage of nuclear weapons by own country, why and how to influence upon them. The army and arms of the general-purpose, as well as the ways and integer of the using them, - is well enough understood sphere for broad public, informed of local conflicts of contemporaneity, but very at term, when socium has not lived long enough to forget about past wars.

Using of usual power even in "not quite democratic" countries requires the certain taciturn consent of folk, which one part must go to wage war, but the other - provide the armies rear support.

However for nuclear weapons this thesis does not operate. Approach time of the ballistic missiles for long range does not exceed some ten minutes, which leaves political management at the best literally several minutes to make the decision about corresponding missile launch. I.e. folk can not influence upon decision on using the nuclear weapons neither straight (on referendum), nor is mediated (through parliament). The nuclear conflict does not require the participations of broad

[7] Akbar M.DZH. New centers of power in epoch of globalization // ROSBALT.RU, 01.11.2006.(http://www.rosbalt.ru/2006/11/01/273229.html)

public masses in it. However democratic supervision and reporting on nuclear arms not only possible, but necessary in specific form, which answers to the nature of this class of the weapons. However they are real only in that case if society will acknowledge need of the democratic supervision taking into account all state politicians, including military.

This, first of all, explains that though folk does not resolve the decisions on cause of the use of the nuclear weapon and does not take the participations in nuclear war, exactly it (the peace population), becomes direct object of nuclear hits, which distinguishes the nuclear conflict from usual war. Even if to imagine that such hits will appear, according to modern military strategy, and will be directed right to military objects, command points and industrial centres, attendant loss for peaceful population would be counted in ten of millions of dead in first hours of war. That's why the folk has a full right to influence on nuclear politics, that is to say, in case of the conflict, exactly this will determine its fate, even more incomparably cardinal rather than any economic, social and political aspects of state politics, traditionally pertained to the sphere of democratic control and supervision.

The second reason is concluded in that, that one of the important particularities of the nuclear weapons (relatively with usual arms) is very limited set of its possible combat tasks and ways of the using it. And therefore classical principle "more it is – better it is" here operates rarely- the best variant there is "clever reduction of the nuclear arms on basis of the defensive parity under simultaneous increase of reliability and safety of these arms"[8]. Therefore, informed public and parliament, being aware of the importance of these factors, is capable to influence upon the program of the arms, strategic balance and through it on probability of nuclear war beginning.

The third circumstance, which speaks in favour of democratic supervision in military nuclear sphere - is a financial aspect of the problem. The expenses on development and support of the nuclear arms annually represent the small part of military expenses (usually 10-15%). However if whole cycle of the development, deployment, supports, and than salvaging the nucleus arms is taken, which forms 20-30 years, than this forms enormous expenses. So rational use of resources is requires objective democratic supervision and reporting not less, than other greater parts of the budget. In this sense it is possible to recall that in Russia in 2002 there were 120 retired nuclear submarines that were rusted and used their potential resource, but 90 of them stood with unloaded nuclear reactors[9].

It is understand that the issue of secrecy of information for nuclear arms requires carefully weighted approach. There is much information, which is necessary to keep in secret. This concerns available technical particularities and perspective systems of the arms and nuclear weapons, managing and warning systems, the combat operational plan for using the weapons, list of aims. Such secrecy practice settled even in totally democratic countries - USA, Great Britain and France. There, apropos, many mistakes in nuclear politics are assumed. However advantage of the democratic system of the supervision on nuclear weapons is not that it helps to avoid the errors, but that it enables liberal discussion of the problems on the base of reliable information and can correct the errors, before they will become the reason of the great losses and further problems.

"Alternative" nuclear weapons

September 2001 terrorist act in USA became an act of the mass destruction of peaceful population even without the use of the nuclear weapons. It is understood that doing of something like this with use of nuclear weapons will have even more disastrous consequences. Regrettably, existing regimes (ANNW and the other agreements, corresponding to international institutions

[8] Mihaylov V.N. The Nucleus weapon of Russia in XXI century // "Analytical notes - 2005. - December.
[9] Arbatov A.G. Spreading the nucleus weapon and terrorism (the shorthand record to lectures, October 4 2002, Moscow physical-technical institute)

on IAEA manners, commission, clubs etc.), not calculated on nuclear terrorism and is not quite efficient in fighting with it. They are calculated for states i.e. on that there is someone, who possible checks through inspections, against whom it is possible to use sanctions or even military power. In other words, we are speaking about real rational mechanisms of control (regimes) of behaviour of rational actors (states). However in terrorist event we deal with surd player (the terrorist and their organizations) with corresponding surd behaviour (which does not define direct "advantages- disadvantages"). According to experts' calculations, these surd players (possible, at first sight reasonably rational actors) can choose four ways of the nuclear terrorist act realization[10] :

1) gained access to radioactive material (for instance, isotope of cobalt or calcium) to melt them with the help of "usual" blast, and than to use it as unique radioactive weapon;

2) to seize the nuclear facility (NPP etc.[11]), than to sabotage or blackmail its threat;

3) gain access to material of the nuclear weapons (uranium-235, plutonium-239), from which produce primitive, but comparatively powerful nuclear device;

4) steal the nuclear ammunitions from arsenal of nuclear state (the warhead or ammunition) and use it in terrorist purpose.

It is clear that in terms of modern research progress (the simplification of the access to nuclear technology[12]), extension of "nucleus club" (to account of the countries with weak economy, not capable to hold the modern system of the supervision on nuclear weapon and material), activations of cooperation in sphere of nuclear energy (in consequence of which "through 15-25 years amount of the nuclear weapons and material received does not grow shorter, but will increase. And first of all, due to spreading of peaceful atom"[13]) and also other prospects of the nuclear terrorism[14] become all more realistic.

From the other side, experience of event on September 11, 2001 shows that main problem of the prevention of terrorist acts (in particular nuclear) has two aspects.

The first is concluded in reinforcement of special safety systems of (first of all) nuclear objects, which can become the aim (or instrument) for terrorists - but because of this it has negative influence upon the general level of the democratic rights and liberties.

The second aspect represents that services are responsible for counter - and antiterrorist activity, at term of secrecy to their activity, poor coordination of practical actions and poor ways of exchange of information - because of this, in spite of presence of information from intelligent agencies and anti terrorist organisations, in order to predict actions on 11 of September 2001, corporative disagreement of intelligence agencies (it accounts several groups of ten services – from CIA to Ministry of Energy) became the reason for not preventing the tragedy on 11th of September 2001.

On our opinion, bigger openness of "nuclear sphere" of national safety for the public, its higher public transparency in this sense can become the additional factor of the reinforcement of national and international safety - after all this mechanism can become the additional system of the supervision on sphere, potentially opened for terrorist actions.

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[10] Arbatov A.G. Spreading the nucleus weapon and terrorism (the shorthand record to lectures, October 4 2002, Moscow physical-technical institute)

[11] Now, all around the world, there are about 450 nuclear reactors and almost 300 research nuclear reactors as well as many other nuclear facilities (storehouses for worked out nuclear fuel, uranium enrichment plants, chemical plants for recycling of worked out nuclear fuel as well.)

[12] Atomic energy actively develops at least in 34 world countries – see Smirnov V.A. Russian – American program "Megatons and Megawatts" – is big scale example of effective economical solving of global problems of mankind. Cosmos. Information. New technologies. - 4. (http://www.tenex.ru/digest/cs.html)

[13] Karaganov S. Non-proliferation of the nuclear weapon and nuclear arms in new age // Modern Europe. - 2001. - 2. (http://www.ieras.ru/journal/journal2.2001/4.htm)

[14] Mihaylov V.N. The Nuclear weapons of Russia in XXI century // Analytical notes. - 2005. - December

Globalisation of public control on nuclear sphere

In future, modern global world system will be defined with complex plans and interrelated regularities in public relations, where actors are and state, and non-state subjects. Difficult problems, which leave borders of national (the ethnic territorial) jurisdiction of different countries, become the point of issue from the side of miscellaneous organization on more and more broad public forums. Such global threats, as ecological catastrophes or terrorism, are capable to influence on life of the people all over the world, have reached such big scales, where none of the countries can manage with these problems by itself.

Considering this, it is reasonable to point out that on the West, knowledge data base is forming which is connected to studies of international relations from ecological point of view. As an example, in 1993 simultaneously in New York and London book named "Environmental bases of political stability"[15] came out.

Process of globalisation influences natural interdependence expenditure of national and global. Altogether it is not only economic but technological progress as well. By itself it also represents political, social and cultural phenomena[16]. On the global level "exchange"[17] of information occurs, which covers information, non material value, symbology and ideas. The steady growth of interdependences concerns and questions of social partnership and civil associations, which also render the assistance to fortification of the potential organizations of "third sector" and public motion from realization of its participation and influences.

So, Thomas Friedman, modern protector of unlimited globalisation in his book " Lexus and olive: understanding of globalisation"[18] describes this trend as creation of "super powered ecologists". Using own discretion, they effectively withstand the corporation (the fight is carried out through Internet, when ecologists in one country quickly inform all other about behaviour of one or another international structure – and than discussions take place, but only that power will win, where technological and informational progress stays behind.

There is no doubt, now the trend of public globalisation (first of all public-economic and than public-political processes) is dominant, which is pointed out in available systems of the supervision on nuclear sphere as well.

In this sense, significantly there is an experience of such informal international organizations like “Greenpeace”. As it is well known, far back in 1971 twelve activists-ecologists on small fishing boat "Phyllis Cormack" from Canadian city Vancouver were heading towards the small island Amchitka on Alaska, where USA government was going to conduct underground nuclear test in that area.

Perceptible that three Canadian initiators of the action - Jim Boylen, Pol Kout and Irvyn Stou (who did not participate in this event) - were Quakers. “Proofs” are practised for a long time in this confession - a form of free will protest, based on thesis, where cruel action is impossible to prevent, than it is necessary at least not to give it a chance to be realized in secrecy, without witnesses.

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[15] *Myers N.* The Environmental Basis of Political Stability. Ultimate Security. – N. Y.; L.: W.W.Norton and Company, 1993

[16] Ref., eg.: Kuliev E.R. The Koran and globalisation: in search of humanistic ideals - Baku: Abilov, Zeynalov and sons, 2005.

[17] Civil societies and global management (the Reference document, prepared by Fernandu Enriki Kardozu Chairman of the Group of the Secretary general formed of the high figures for consideration interrelations between UN and civil society - http://www.un.org/russian/partners/cardoso.htm

[18] Friedman T.L. The Lexus and the Olive Tree: Understanding Globalisation – S.l.: Anchor Books, 2000

In particular, in 1958 American Quakers tried to protest in such way against test of the hydrogen bomb on atoll Bikini in Pacific Ocean, but equipped vessel with its crew was arrested, and sails did not take place. Therefore initiative was based on powerful and well-designed tradition.

Respective (and hitherto the most authoritative in North America) ecological organization "Sierra Club", whose member were three Canadians, did not dare "to give an agreement" to their initiative. So organizers have named its company "Green world" (Green + Peace = Greenpeace – there was not enough place on a side of the vessel to write it apart so the name is merged). Ecologists' protests have forced the USA government to stop the tests in Amchitka region just before the end of the year. The Island changed on bird resort, and this became the first victory of "Greenpeace".

The following protest event of "Greenpeace" took place in 1975 near atoll Moruroa in south part of the Pacific ocean, where France conducted atmospheric nuclear tests (it was conducted by David McTaggart, who in 1979 took a lead of "Greenpeace International" [19]). Due to "Greenpeace" action France has also stopped their own test.

In 1985 "Greenpeace" vessel ("Rainbow Warrior") has conducted the evacuation of the inhabitants of pacific atoll Rongelap, where more than 95% of population suffered from radioactive contamination after blast of the atomic bomb on American firing range. The "Rainbow Warrior" crew planned in a short time to realize the overt protest against test, which once again was going to be conducted by France on atoll Moruroa. However French special service agents blew the vessel on the eve of action in harbour of the New Zealand port called Oakland (where "Greenpeace" photographer Fernando Pereyarovaya has perished). In 1987 under very strong international pressure French government has paid "Greenpeace" 8,16 mill. New Zealand dollars as compensations (besides, sabotage costs to French Minister of Defence his chair and career).

The Experience of such organization, as "Greenpeace" (which presently has over 2,5 mln adherents and representation offices in more than 40 countries), shows that conflict between society, business and state is not fatal, after all the integrated possibilities are both ment for modernization of state control, and for development of society. In classical ("west") three-sector scheme public associations solve the conflicts, which appear in them with subject of the management (in ecological, social and the other spheres), for mediation parties of power and for participations political parties, which have legislatively installed restrictions on economic activity. Significant and that protest events and "direct actions" are more and more often complemented with exploratory and even design functioning of "green" NGO - as in cooperation with state parties, so and on their particular order.

Nuclear weapons: Ukrainian measurements

As it is well known in the world of nuclear weapons, Ukraine took the positions of the nucleus disarmament. In Ukrainian State Sovereignty Declarations of the 1990 it was proclaimed that Ukrainian state has an intention to keep three non-nuclear principles: "not to take, not manufacture or not to buy the nuclear weapons". This longing of the Ukraine was repeatedly confirmed in multiple Statements of Verkhovna Rada and in other State documents.

Considering this, in present day, there is no doubt in "non nuclear stereotype" of Ukrainian state in world public opinion.

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[19] As D. Maktegart wrote at the end of 70th "The purpose of "Greenpeace International" establishment was to make this organization international one, avoiding to be entrapped as many groups, that was trying to establish "international organizations", neglecting centralized decision making. Indeed I know: we don't like words "centralized decision making". But transnational companies and governments, which policy we are trying to change, fear this wording when we are talking about movements and opposition" (ref. Zhykov B. Corporation of fighters against corporations // Great business.-2005.-No.10(http://www.stengazeta.net/article.html?article=537))

However, in present day, this situation is complicated by the presence of foreign state military forces in Ukraine, which remains one of the leaders of “nuclear club” Demonstratively, in this sense, international scandals are related with allocation of strategic bombers of RF in Crimean military aerodrome, which (to say the least theoretically) can be used as carriers of the nuclear weapons. With motivated suggestion (at least for next ten years) Independent experts also accept the possibility of present of nuclear weapons on the board of some Russian fleet vessels.

Considering almost total opaque activities of RF military formations in Crimea, even for Ukrainian state (significantly there are previous results of responsible sub-commission of Ukrainian-Russian commission) not to say about non state segment, non regulated perspectives of occurring of such situation can greatly damage the international position of the Ukraine.

Conclusions and proposals

Chernobyl NPP accident in 1986 and terrorist attacks in USA (2001) increased the speed of development of international cooperation in sphere of safety (nuclear sphere in particular) and in creation of global politician-economic bases and social-humanitarian safety as one of most important aspects of the process of globalisation of "secure" world.

Today, the world becomes all more and more complex, and globalisation of not only technologies, business and communication, but in particular, terrorism concerns whole humanity. So decision, is called to raise nuclear safety in its political-economic and social-humanitarian measurements, it requires complicated approach with interests for other main key parties, national politicians (after all exactly national state remains the leading actor of the international relations) and world trend.

Global regime of nuclear safety must be based on interests of the broad range as national and international, as well as trans national (social) subject in achievement of total integer at conservation of the sovereignty, authority and accounted abilities of international state organizations.

We are talking about such subjects, as industry, government, non-governmental and intergovernmental organizations, community state and non-governmental expert and civil society (in particular its international measurement).

Accordingly, modern democratic system of nuclear safety is based on four main elements:

1) further broad joining to obligatory and recommended international legal documents (the safety convention, behaviour codes etc.);
2) all-embracing complex rates of nuclear safety, which personifies "best practice" as landmark for ensuring high level to safety required for the whole nuclear activity;
3) complex international actions of transparency, expert inspection and services in sphere of safety, based on observance of all norms of nuclear safety;

4) the need of the creation and provision of activity of the powerful national infrastructures and global community experts.

The National infrastructures cover corresponding legal and institutional aspects, in particular nuclear regulation body, research and educational institution (including, one of the institutions of "third sector") and industrial potential. For continuous increase of defence and mutual education these very important networks are expert knowledge and expert knowledge in defence experience. These networks must be self-insured and self-regulated and comparatively independent (from the authorities and business) structures.

It is also important not to forget that reinforcement of the public supervision on nuclear sphere simultaneously becomes factor of objective analysis of safety of ecological and technological condition. But the society control on actions of state structures is possible only with presence of

experts in society, able correctly evaluate actions of these structures – otherwise the state will easily ignore international controllers by blaming them in incompetence and instead of constructing the dialogs, the cycle of mutual blames will begin, which will hardly help to solve the security problems.

What Means *Nuclear Security Culture, or* to Define in Order to Work Effectively

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Introduction

Recently due to the international community's war on terrorism it is very often that the problems of what is named in English *nuclear security* appeared to be in the focus of G8, UN, International Atomic Energy Agency (IAEA) and other authoritative international organizations and structures. This topic, in author's view, has not been adequately addressed in a form of a proper definition in the national legislation and regulations nation-wide recognized by experts and other people involved. In connection with the fact that more and more experts and officials of relevant ministries and agencies are becoming adherents to the idea of necessity to codify national nuclear legislation, and already some arrangements have been made with this purpose, the task of a terminological support to the legislative activities appeared to be of high priority. In the paper an attempt is made to propose certain approaches, which in author's view, square with IAEA's ones to a maximum degree.

Nuclear security culture. Problem identification

"*The modern society, whether in developed or in developing countries, depend on the availability of nuclear energy and on the day-to-day use of radioactive materials in medicine, agriculture, industry and for research. Before 9/11, these activities were mainly covered by safety rules regarding health and environment. Since 9/11, it is clear, that these activities also require adequate security. For the continued, and expanded, use of nuclear energy or radioactive materials, nuclear security is indispensable and an important prerequisite for successful and sustainable development.*"[20]

The course of the war on terrorism stated by a number of the leading countries has shown that this problem will not be solved through military operations alone and needs for complex and long-term efforts aiming at liquidation or (it is more realistic) at minimization the reasons leading to terrorism. On the other hand, despite a sad experience of Chernobyl one can see the indications of so called *nuclear renaissance* – a new wave of nuclear power industry development. Thus, two different processes – combating nuclear terrorism and nuclear power industry development will run within certain, quite a long period of time, in parallel, and it is the task of civilized humankind not to allow their trajectories are intersected.

As one of the directions of the international community's efforts to execute the task described ensuring *nuclear security culture* has been recognized, despite experts are still working to define exactly this term and to develop conceptual approaches to this quite a new task.

The *nuclear security culture* is a separate case of a more general idea of *organizational culture* of which the most adequate definition was given by Edgar Schein[21], one of the founders of the organizational psychology. Schein defines that organizational culture is "a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems."

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[20] T. Taniguchi, IAEA Deputy Director General, *Nuclear Security: Lessons Learned from the Past and Future Global Directions,* Proceedings of the International Conference "Nuclear Security: Global Directions for the Future", London, 16 – 18 March, 2005.

[21] Edgar Schein, *Organizational Culture and Leadership*, 2d ed. (San Francisco, CA: Jossey-Bass, 1992), p.47

As a specific case of organizational culture one can consider corporate production culture at an enterprise. In case of activities aiming at implementation of a set of measures directed to nuclear materials and facilities protection against unauthorized and malicious actions, i.e., ensuring nuclear security, then organizational culture takes the form of nuclear security culture.

The field of nuclear power utilization has a pronounced specificity caused by a potential danger of technologies involving nuclear and other radioactive materials. That is why organizational culture issues in this field have been always treated as very important; nevertheless the term *safety culture (Ukrainian - kul'tura bezpeky)* was originally introduced only in the *Summary Report on the Post-accident Review Meeting on the Chernobyl Accident,* INSAG Series No.1 issued by the IAEA on 2 October 1986.

But this term addressed the problems of nuclear technologies safety, i.e. personnel, public and environment protection against potential harmful influence of ionizing radiation. In reality, this direction of IAEA's and its member-states activities became especially actual in the afterwards of the Chernobyl accident, which had brought the prospects of nuclear power industry into a question. Serious efforts of the international community in this direction had resulted in development and publication of the IAEA's first document on this topic, namely, - "*Safety Culture (A Report by the International Nuclear Safety Advisory Group*)", INSAG Series No. 4.

As for nuclear security, its actuality also was growing in the end of XX century but especially dramatically this process run after the former USSR dissimilation resulted in world balance upset and increasing impact on global security of both rogue nations and non-governmental actors – terrorist and extremist groups as well as escalation of regional conflicts caused by national, confessional, social and other contradictions.

At the turn of the XX century the world faced the old threat – terrorism but in its new, more dangerous form, - international terrorism seeking for acquisition of weapons of mass destruction (WMD), first of all, nuclear weapons. Unfortunately, doubts about terrorists readiness to use WMD were chased away not after the first warning – extremist religious sect Aum Shinrikyo's members attack in the Tokyo's metro, but only after the unprecedented terrorist act on 11 September 2001. The majority of countries and relevant international organizations took urgent steps to improve global security including protective measures against terrorist attacks directed to a national critical infrastructure. It is undoubtedly that in the countries using nuclear power the objects and facilities connected with this process belong to such a category.

Therewith growing the threat of nuclear terrorism and nuclear proliferation has made clear that the coverage of measures aiming at ensuring nuclear security and associated with it culture needs to be expanded beyond the traditional tasks mainly limited to protection of nuclear facilities and nuclear materials which could be used in nuclear weapons manufacture.

In compliance with this approach the IAEA Advisory Group on Nuclear Security recently proposed a new broader definition of nuclear security. According to this group nuclear security is "*the means and ways of preventing, detecting, and responding to sabotage, theft and unauthorised access to or illegal transfer of nuclear material and other radioactive substances, as well as their associated facilities*".

The course of the war on terrorism has shown that despite certain successes the considerable reduction of the terrorism threat will probably take a long period of time, and along with short-term urgent problems to secure nuclear power utilization it is also necessary to launch long-term factors for positive influence on protection of nuclear power objects and a relevant infrastructure against malicious acts (first of all terrorist acts). And ensuring the adequate level of nuclear security culture should be assigned to such factors.

With regard to this approach the international community has reached a consensus. Really, security culture was included in 12 fundamental principles of physical protection of nuclear materials and nuclear facilities listed in the *Amendment to the Convention on the Physical*

Protection of Nuclear Material approved at the special IAEA conference in July 2005 and already ratified by a number of states (at the moment Ukraine is still preparing to ratification of a relevant act).

When analyzing the status of ensuring nuclear security, in the author's opinion, it should be taken into account that in the nearest future the requirements to nuclear security culture will be determined with the demands of security environment which were rigidly "generated" due to 9/11 and the circumstances in which the international community is combating terrorism.

According to the present-day ideas relatively to ensuring an adequate level of nuclear security culture such a level of culture provides for assessment of threats sources and scales. The facility personnel should understand importance of security measures, and this understanding makes considerable influence on personnel activities and determines its behavior both in regular operation and in emergencies.

And this approach is true not only at the facility level but also at the nation one too. It means that the assessment by a state of a threat of malicious acts (first of all nuclear terrorist acts) in the field of nuclear power utilization shall be a ground for ensuring an adequate level of nuclear security culture.

Besides, at the facility (organization) level the status of nuclear security culture can be characterized by:

- the degree to which all personnel, from senior managers and supervisors down to the most junior operators are aware of and committed to widely understood security requirements and best practices;
- the degree to which available and affordable security technology is put to use, kept in good working condition, and improved;
- the degree to which security regulations and procedures are implemented and personnel are motivated to accomplish their security-related tasks.[22]

The terminological aspect of the problem of ensuring nuclear security

Efficient efforts with the aim to solve a problem, first of all, provide for its exact identification which is impossible without widely recognized terms and ideas due to which the problem can be described.

Personal experience gained from participation in international events devoted to the problems of ensuring nuclear security, sharing opinions with foreign colleagues have shown that the terminological difficulties often occur in the languages where English words "*security*" and "*safety*" are translated similarly. In Ukrainian both words are translated as *bezpeka.* The same situation is in Russian, Bulgarian, Spanish and some other languages.

Also when these synonymic English words are translated into Ukrainian with the same word, it often leads to confusing situation with regard to such derivative terms as *nuclear security* and *nuclear safety,* which until recent time were translated into Ukrainian similarly – *yaderna bezpeka,* although in the field of nuclear power utilization these English terms have a principal semantic difference.

The essential difference is that in this field the different pairs "subject – object" correspond to the above terms when considering actions (influences) adequate to relevant activities. Really, when one talks about measures to ensure *nuclear safety,* it means that the measures to protect personnel, public and environment have to be undertaken to protect the listed objects from harmful exposure of nuclear technologies (mainly due to ionizing radiation). In this context a subject is nuclear technologies, while an object is personnel, public and environment. On the

[22] Nuclear Security Culture: The Case of Russia, report issued by the Center for International Trade and Security of the University of Georgia, U.S., December 2004

contrary, in the case of *nuclear security* the situation is in direct opposition to the previous one: i.e., nuclear technologies (nuclear materials, facilities, etc.) are considered as an object (potential object) in terms of unauthorized or malicious actions by individual persons or group of persons (subjects) against which the nuclear technologies shall be protected.

Ignorance of this essential difference led to the situation when even in the official IAEA's documents translated into Russian (one of the Agency's official languages) one can find several versions of translation of the terms *security* and *nuclear security*. The similar situation occurs with translation of IAEA's documents into Ukrainian (if any).

In the majority cases *nuclear security* is translated into Ukrainian as *yaderna bezpeka,* and that is often confusing especially when in original texts both nuclear security and nuclear safety are mentioned. Such translation is inadequate, prevents proper document perception since in this case a reader can think about nuclear safety measures covering different field of activities and carried out by different personnel.

Sometimes both Russian and Ukrainian translators borrowing translation of *security* from early IAEA's documents addressing radiation protection matters, translate this term as *zberezhenist' (sokhrannost'* – in Russian*).* This term is applied in Russian versions of some IAEA's documents addressing safety and security of radioactive sources, and in the relevant Ukrainian regulations in this field.

In author's view, such a translation of the word *security* might be acceptable for radioactive sources, while is unacceptable if the scope of this term translation is extended too broad, in particular, to NPPs. Besides, the Ukrainian word *zberezhenist'* according to its semantic nature can not cover such types of activities as interdiction of and combating illicit trafficking in nuclear and other radioactive materials, i.e. activities which, according to the IAEA's approaches, are assigned to the measures aiming at ensuring *nuclear security*.

Recently, in the IAEA's documents on this topic one could observe a trend promising application of a unified approach to terminology generation when translating official documents into Russian. In particular, in the Russian versions of such documents as *Amendment to the Convention on the Physical Protection of Nuclear Material* (CPPNM/AC/L.1/1) and the Report of IAEA Director General *Nuclear Security – Measures Against Nuclear Terrorism* (GOV/2006/46-GC(50)13) the term *fizicheckaya yadernaya bezopasnost'* is used.

Conclusions

In author's opinion it is the terms *fizicheckaya yadernaya bezopasnost'* (in Russian) and *fizychna yaderna bezpeka* (in Ukrainian) that are the most appropriate to use in national legislations. That is why basing on the IAEA's approaches, it should be recommended to use in developing Ukrainian laws and regulations on physical protection, accounting for and control of nuclear materials and other radioactive materials as well as relevant facilities (infrastructure) where the materials are produced, as well as in use, transport and storage the term ***fizychna yaderna bezpeka*** and the derivative of it ***ku'ltura fizychnoi yadernoi bezpeky*** providing them with adequate definitions and interpretations. When so doing it should be taken into account that it is a rather complicated task requiring involvement of all national expert community and synchronization of efforts with those at the international level (first of all with terms and definitions approved by the IAEA[23]).

As for the term ***zberezhenist'*** and those being derivative from it, in author's opinion it would be reasonable to limit their application with the measures of accounting for and control of radioactive materials for which physical protection measures are not necessary.

[23] At the moment the expert group established by the IAEA is developing definition for the term *nuclear security culture*

Summarizing consideration of this terminological problem it should be noted that despite in Russian and Ukrainian documents the terms, respectively, ***kul'tura bezopasnosti*** and ***kul'tura bezpeky*** have been used in the field of nuclear power utilization since the second half of 1980-th – first half of 1990-th, actually until the recent time (at least before 9/11) these terms in most cases was not in full compliance with the meaning of the English term ***security culture***.

To have a full picture it should be mentioned that some of the Ukrainian experts believe that it is not necessary to apply the "Russian" approaches revealed in translation the recent IAEA's documents on physical protection in Ukraine. They propose to avoid using the terms *fizychna yaderna bezpeka* and *kul'tura fizychnoi yadernoi bezpeky* since the term *yaderna bezpeka* already has historically used in a certain meaning. In author's opinion, it is not a reasonable position which will not help to exclude terminological problems in the future but, on the contrary, will accumulate them bearing in mind the following: first, - unfortunately, no more appropriate term is available in Ukrainian; second, - the Russian language is one of the official languages of the UN and the IAEA, and Russian versions of the IAEA's and UN's documents have been traditionally widely used in the nuclear field in Ukraine which (it is also a historical tradition) is to a considerable degree Russian-speaking.

Kaleidoscope

"General Electric" for the development of business in nuclear sphere In India

American corporation "General Electric" is interested in development of business in India in sphere of nuclear power and ready to create special organizations with local companies. Mr. Andy White, who is the president and head operational director of nuclear subsection in "GE Energy", has announced that. "We are ready to enter Indian market as owners and as exploit organization", - Mr. White announced at the press conference in New Deli on 8th of November 2006. According to him, the American company is studying different variants of building new nuclear power stations in India or taking part in expending of existing NPPs. "India has great knowledge and Indian companies are able to take a part in global scale project together with GE", - the president of GE has noted.

Mr. Whites' press conference took place according to negotiations with management of Indian nuclear power corporation commission. General annual GE income from operation in nuclear sphere is 2 billion USD, where general income of the company is 163 billion USD. Before 2025, India is planning to increase part of its power production on NPP in general balance to 25.0% against today's 2.7%. Interest to Indian nuclear technologies market, after signing American – Indian agreement and after the President of USA George Bush's visit to India in March, recent year, exposes a lot well known nuclear corporations, including French group AREVA.

Mr. White optimistically looks through the ratification of agreement about cooperation in sphere of civil nuclear power between India and USA in USA Congress.

As it is known, India is not a member of the Agreement on non-proliferation of Nuclear weapons and de facto holds nuclear power. According to ANDNW demands, it is forbidden to cooperate in nuclear sphere with countries, who did not sign this Agreement. Nevertheless, in 2005, George Bush's administration initiated the process of brining corrections to USA legislation and managing principles of nuclear power supply group, which could give an opportunity to export reactor technologies to India. USA Senate did not have enough time to discuss and accept the agreement before re-elections in November, which could legalize nuclear agreement between USA and India. As it is known, democrats won the elections, who are traditionally stand for strengthening the regime of non-proliferation of weapons of mass destruction, which is opposite to republicans – supporters of pragmatic approach. Democrats were very active against "acception" of India during the discussion of legislation in Senate Committee during summer of this year and insisted on India to join ANDNW and to freeze its nuclear military program on early stages of accepting the legislation. USA administration still has a chance to "stretch" Indian bill during last Senate session at the end of November. But experts say that democrats prevent this and will try to change the date of voting on agreement with India in next year. Such prolongation will lead to consequences where it will be necessary to repeat the formal procedures for "Indian legislation" from the beginning. Bureaucratic details of American legislation process are worrying not only Delhi and Washington but the rest of world suppliers of reactor technologies, including Russia and France ("Atomstroiexport", which is hoping to get the contract for at least building of two new power blocks at the "Kundakulan" NPP; AREVA Group, who shows interest in new NPP at "Gaitapur" sight.) Countries – members of nuclear Suppliers Group made an informal decision to leave the blockade on supplying nuclear technologies to India, until USA will do otherwise.

According to Nuclear.ru and Iranatom.ru

Committees of Russian State Duma recommended accepting the legislation on reconstruction of Russian Federation nuclear complex at the first reading session

In Russian Federation State Duma Committees, the legislation "specialties of managing and arranging property and stocks of organizations that are using nuclear power, and brining in changes to some Russian Federation legislation acts" is taken under the consideration.

Russian Federation State Duma committees on questions of property, at the session on 9th of November 2006 recommended accepting this legislation at first reading session. Aim of the legislation – forming of legitimate post for reconstruction of Russian nuclear complex by creating vertical integrated structure on basis of stock company, federal state unitary organizations and nuclear power federal institutions in civil sector.

Committee undertook the conception of the legislation, directed to change organizational – legislative base of nuclear power field functioning, according to economical interests of state and respected ways of managing.

Legislation foresees the creation of stock company according to the decision of the President of RF, where stocks of present nuclear power complex stock companies will be attracted to statute capital, stocks of companies, which are created on the bases of FSUO stock companies and property of state nuclear power complex.

According to the legislation project, its action will not cover organizations with nuclear weapons complex and the structure will be announced by the President of RF.

The order of making structural changes in nuclear complex is stated in the legislation project, as well, there is an order to manage the stocks of main stock company. Plots, where the companies are located and can be privatized, are also pointed out.

State Duma Committee of RF on the questions of Power, Transport and Communications considered this legislation project and recommended to accept it in first reading session.

According to "Interfax"

Nuclear weapons are absent in defense doctrine of Iran

"There is no place for nuclear weapons in our defense doctrine. We want to use our rights in margins of the Agreement about non-proliferation of Nuclear weapons. There will be no violation according to the agreement, but we are ready to negotiate", - announced Mr. Ali Laridgany, the secretary of the Highest Council of National Security of Iran, as the result of negotiations with his Russian colleague Igor Ivanov, negotiations took place in Moscow, from 9th to 10th of November 2006.

Mr. Laridgani thinks that acceptance of UN Security Council resolution for Iran's nuclear problem will not help to political regulation, and those states that are supporting its acceptance are able to raise the problems of this region.

Iran insists on its right to own nuclear cycle, including uranium enrichment. This calls for worries of world cooperating organization, which is afraid that Teheran will use nuclear program in military purposes. "Six" countries demand Iran to stop any activity of uranium enrichment.

At UN Security Council, questions of imposing sanctions on Teheran are taken under consideration, which foresees prohibition on delivery of sensitive technologies to Iran, which can be used for creating nuclear weapons. Russia insists that methods against Iran would be related to actions of Iran and limited in time, nevertheless negotiations will go on.

Mr. Laridgani did not exclude the possibility to create general uranium enrichment organization on the territory of RF. "This proposition is never repealed", - he said.

According to Iranatom.ru

Peaceful atom is rehabilitated

International Energy Group (IEG) presented following report "World Energy overview 2006"

It is suggested to energy users to concentrate on using energy saving technologies, because of increase in demand of fuel, even by outrageous estimates, investments will hardly provide needed level of output of initial resources. Accept that, as it is mentioned in the document, nuclear power is rehabilitating, which was frozen in Europe after Chernobyl tragedy. According to head of IEG, Mr. Clode Mandil, before year 2030 total amount of energy produced by NPP will increase to 40%, if to compare to today's level. Taking it into account, role of the state in attracting investments must scientifically increase; otherwise there will be no progress in this field.

IEA was created during oil crises in 1973 year – 1974 year. Its main role is to give an advice in forming Energy policy for 26 countries – members of organizations, including USA, Canada, Australia and 19 European countries, including UK and Germany.

According to base scenario (for saving present dynamics of global power market development), world demand on initial energy sources will increase to 53% before 2030. Considering this, more than 2/3 of income will lay on developing countries, with China and India at the lead. IEA experts think that because of main consumers' resource poverty, oil and gas import to these countries, as well as in Organization of Economic Cooperation and Development will increase quicker compare to demand. According to IEA forecast, consumption of main energy source – oil – will increase to 43% (from 84% to 116 mill. barrels per day). Limited numbers of members of countries organization are oil exporters, who will provide these needs, because approximately before 2015 possibility of other countries – producers with increase extraction will be totally exhausted. World economy is based on increase of (as well as production) energy source consumption as it is shown in report. CO2 pollution will rapidly increase to 55%. According to IEA forecast, already in year 2010 the leader in polluting the atmosphere will change. China will take the lead from USA.

All of this will lead to significant increase in dependence from OPEC and other big oil production countries. This process will be accompanied by increase of oil price. In 2010, average price per one barrel will reach 57.79 USD per barrel and in 2030 – will reach 97.3 USD. This scientifically exceeds IEA forecast, according to which, the average price in long terms perspective reach 47 USD per barrel. At the same time demand in investments for support of development of today's deposit and opening new ones, comes to giant sum of 20 trillion USD.

Future for energy can be provided by the costs of Energy National Policy for every country. Beforehand, means of energy saving and development of alternative types of energy is necessary, including nuclear power. In this case global demand of limited energy resources can be lowered to 10% which will give an opportunity to decrease CO2 pollution down to 16% (today it is emission in USA and Canada altogether). In OECP countries heist point of oil consumption and CO2 pollution will come during following decade. After year 2015 these figures will begin to decrease.

In IEA experts' opinion on given means are effective from the point of view of expenses. At the first stage it is necessary for consumers to spend some means on inculcation of innovation technologies, these contributions will get back at the cost s of saved energy. Additional investments to energy saving are much lower, than needed contributions from oil and gas producers to develop new deposits and to build a transport infrastructure. According to calculations, on average, every 1 USD invested in energy saving can save 2 USD of total contribution into extraction, transportation and partition of energy resources.

According to "Vremia Novostei"

Review of the recent IAEA publications

The International Atomic Energy Agency as the leading international organization in the field of counter-action nuclear proliferation and nuclear terrorism pays attention to development of the documents on these topics on an on-going basis. In the aftermath of 11 September 2001 international community's efforts in this field have been sharply activated, and this is resulted in an increasing number of Agency publications and documents addressing physical protection, safeguards, combating illicit trafficking in nuclear and other radioactive materials, etc. Various in their format and status these publications, nevertheless, in editorial board's opinion, are very useful for experts, state employees, researchers and other people involved in relevant activities. The IAEA publications, as a rule, accumulate the best practices in one or another direction, contain both description of fundamental approaches and specific ways for solving problems. Unfortunately, Ukrainian expert community in this field feels the lack of regular information about new publications of the IAEA and other international organizations. Through this brief review of IAEA publications the editorial board of "Security and Nonproliferation" is making an attempt to fill up, at least partially, the existing gap in the realm of nuclear security and associated with it topics.

1. ***Categorization of Radioactive Sources Safety Guide,*** *Safety Standards RS-G-1.9, date of issue: 19 July 2006*

This document is the translation into Russian of the English version of the document containing the guiding recommendations for a risk based ranking of radioactive sources and practices in five categories. The categorization system is based on a logical and transparent method that provides the flexibility for it to be applied in a wide range of circumstances. On the basis of this categorization, risk informed decisions can be made in a graded approach to the regulatory control of radioactive sources for the purposes of safety and security. The categorization system is based on the provisions of the IAEA document *Categorization of Radioactive Sources*, IAEA-TECDOC-1344.

This document is aimed to support international efforts to control the sources of ionizing radiations and security of radioactive sources, in particular, to meet the requirements of the *Code of Conduct on the Safety and Security of Radioactive Sources*

Document size: 57 pp.; file size: 1010 KB.

2. ***Manual for First Responders to a Radiological Emergency****, date of issue: 27 November 2006*

The aim of this publication is to provide practical guidance for the first responders who will respond during the first few hours to a radiological emergency and for the national officials who would support this early response. This publication provides guidance in the form of action guides, instructions and data that can be easily applied by a State to build a basic capability to respond to a radiological emergency.

Document size: 94 pp.; file size: 2959 KB.

3. ***Handbook on Nuclear Law*** *(Russian version), date of issue: 20 April 2006*

This publication is a new resource for assessing the adequacy of national legal frameworks governing the peaceful uses of nuclear energy. It provides practical guidance for governments in

enhancing their laws and regulations, in harmonizing them with internationally recognized standards, and in meeting their obligations under relevant international instruments. This handbook contains concise and authoritative information for teachers (lawyers, scientists, engineers, health and radiation protection workers and government administrators) on the basic elements of a framework for managing and regulating nuclear energy.

Document size: 193 pp.; file size: 1972 KB

4. ***Amendment to the Convention on the Physical Protection of Nuclear Material,*** *IAEA International Law Series No.2; date of issue: 21 September 2006*

This publication brings together in a more convenient format the official records and other relevant documents relating to the negotiations on the Amendment to the Convention on the Physical Protection of Nuclear Material. The Amendment makes it legally binding for States Parties to protect nuclear facilities and material in peaceful domestic use, storage and transport. It also provides for expanded cooperation between and among States regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offences. The Amendment constitutes an important milestone in the global efforts to combat nuclear terrorism.

Document size:158 pp.; file size: 950 KB.

5. ***Nuclear Forensics Support Technical Guidance,*** *IAEA Nuclear Security Series No. 2, date of issue: 19 June 2006*

Nuclear scientists have recognized that much can be learned from the analysis of reported cases of illicit trafficking of nuclear and other radioactive material: What specifically could the material have been used for? Where was the material obtained from: stock, scrap or waste? Was the amount seized only a sample of a much more significant quantity? These and many other questions can be answered through detailed technical characterization of seized material samples. The combination of scientific methods used for this purpose is normally referred to as nuclear forensics, which has become an indispensable tool for use in law enforcement investigations of nuclear trafficking. This publication is unique in bringing together for the first time a concise but comprehensive description of the various tools and procedures of nuclear forensics investigations that have heretofore been described independently in the scientific literature. It also incorporates the experience accumulated over the last decade by law enforcement agencies and nuclear forensics laboratories confronted with cases of illicit events involving nuclear or other radioactive materials.

Document size: 67 pp.; file size: 680 KB.

The review was compiled by Sergiy Kondratov (Institute of National Security Problems) according to information available on the IAEA's Internet Home Page: http: www.iaea.org/IAEA Publications/New Publications/