Energy Security: Operational Highlights

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Contens

Editorial

In energy security sector transformation through the innovation and technology is essential goal or a forceful sequence of need to go along with others. It may be chosen consciously or not either to become an innovator or stay conservative until the last possible point: one may be a vanguard, one may join the most populous group of mass users and, lastly, one may choose to stay conservative and obtain the new ideas just when they are fully checked.

When considering NATO and NATO Energy Security Centre of Excellence, we face the same approach while willing to transform and enact innovations for the operational energy security. Statements are made on high level, the overgrowing number of precise experiments and application of innovation is on a growing number, but the existing shortfall in understanding is still here.

For the big change there is a need to gather the critical flow, which would see the new as valuable, beneficial and helpful. The flow should consist on Member States, Partners and NATO institutions. Without it even a best solution will stay in one "room", not having connection the "whole building". Importance for NATO is not just to emphasize "green" and innovative need on the high level or try to include it in to very important scenarios of exercises. As well should be wisely understood that every Member States and Partner should understand this issue as a key one. Not a particular experiments in particular states should be a seek, but overall move.

After the statement of needed joint efforts in all levels, for you, reader, are offered three articles to reflect. Implementation of energy security in NATO exercise and valuable results of "Capable Logistician 2013" are given to present the positive implication towards energy efficiency and preparedness for vulnerabilities. On a contrary, with the example of Poland may be seen the insufficient efforts to shape the country policy towards the "green solutions". Contrasting insight of current realities should serve as understanding that there is a need for more inclusive initiatives: such as Steadfast Jazz 2013 exercise including among other energy factor in its scenario.

Dr. Susanne Michaelis (NATO Emerging Security Challenges Division, Energy Security Section) talks about the innovation and achievement in energy efficiency and use of alternative or renewable sources. The importance of "Smart Energy" in NATO is underlined. The author presents the "Capable Logistician 2013" project. Already with positive results, the combination of diesel generators and renewable energy sources, are presented to be beneficial and having future potential.

Dr. Robert Czulda (Adjunct at the Political Studies Institute, University of Lodz – Poland) raises concern and presents the current situation of Poland. The country depending on the import of energy resources, reliant on coal, to current day pays little attention to renewable and alternative energy resources. Understanding inefficiency of energy in military structure, reflection in the political and strategic level on this issue is still lacking.

Heiki Jakson (Subject Matter Expert at the NATO ENSEC COE) reveals in this article ideas about the biggest training event of NATO after the Cold War Steadfast Jazz 2013 and the new form of scenario "Skolkan". There are risen implication about the need to implement critical energy infrastructure protection aspect into the exercise setting and scenario development. A need to distinguish reliance of society on energy sources in developing and developed societies presents a reality of different vulnerabilities, needed logistic solutions, nature of threat. Geographical area presupposes a different operational solutions and even Europe is now commonly called safer than ever readiness to hold actions in this area are welcome.

Regards,

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Smart Energy at "Capable Logistician 2013"

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At NATO, "Smart Energy" has now evolved from a mere buzz word to a set of concrete activities that help nations with advancing energy efficiency in the military[1]. It took less than one year from the first NATO conference in November 2011 until the launch of NATO's Smart Energy Team (SENT) in October 2012. SENT is comprised of eight subject-matter experts whose goals are to enhance the sharing of information, to recommend best practices and to initiate multinational NATO activities. At the military exercise "Capable Logistician 2013" that took place in June in Slovakia SENT presented its first tangible milestone: a Smart Energy component that demonstrated possible solutions for reducing fossil fuel consumption in military camps. What are the lessons learned? Can NATO help its military forces to improve their energy performance in an interoperable way?

The Evolution of Smart Energy at NATO

The conference and exhibition "Innovative Energy Solutions for Military Applications 2011" (IESMA 2011) marked the first time that NATO provided national experts with an opportunity to share their views on energy issues in the military. The event, supported under NATO's Science for Peace and Security (SPS) Programme, was jointly organised by the then Lithuanian Energy Security Centre[2], NATO's Emerging Security Challenges Division (ESCD) and the Ministry of Foreign Affairs of Ukraine. It took place 9-10 November in Vilnius, Lithuania, back-to-back with NATO's "Steadfast Juncture 2011" exercise and brought together over 200 experts from academia, industry and the military.

In response to the high interest generated by this event, NATO organised a number of follow-up seminars with national experts in charge of developing energy strategies and technical solutions within their own national structures.

During these seminars, two main conclusions were drawn. First, energy issues and possible solutions are cross-cutting with respect to the three military services (i.e. the Army, the Navy, and the Air Force), multiple disciplines (e.g. policies, concepts, planning, engineering and research & developments) and various NATO stakeholders (i.e. NATO bodies, committees, working groups, agencies and NATO's Centres of Excellence). Second, reducing energy consumption will not only reduce costs, but also increase the security of soldiers.

Military Benefits

Over the past years, the amount of fuel spent per soldier in military operations has increased substantially, mainly due to the use of additional equipment to improve combat capabilities and living conditions in military camps, yet without taking energy efficiency and effectiveness into account. As a result, current military operations require large amounts of fuel to be transported by convoys that have become an easy target for attack.[3] The amount of

[1] It should be noted that "Smart Energy" has no formal definition. The term has been created by NATO's Emerging Security Challenges Division as a working title in order to provide an easy reference.

[2] Since July 2012: NATO Energy Security Centre of Excellence (ENSEC COE).

[3] Data on the total number of resupply convoys in theatre is currently not reported in the Army. In 2007, the US resupplied 87,731,302 gallons (over 230 million litres) of fuel in Afghanistan. Resupply convoys vary significantly in terms of size and composition. A typical resupply convoy includes 16 supply trucks with 97,818 US gallons (about 370,000 litres) if "full-up". Therefore it can be calculated that 897 fuel convoys travelled to Afghanistan in 2007.

equipment (e.g. helicopters and gun trucks) and number of personnel required to protect these convoys is significant.

The price to pay - in terms of money and human lives - for resupplying fuel is high. Estimates for Fully Burdened Cost of Fuel range from about 2 Euro to over 10 Euro per litre, depending on the basic fuel price and the force protection and delivery route required.[4] A US Army study that looked at figures from the period 2003-2007 concluded that for every 24th fuel convoy to Afghanistan one person was killed, resulting in an average of 38 soldiers and contractors killed per year[5]. Hence, reducing fuel consumption by using energy in smarter ways will not only save money and lives, but also free resources and capacities for combat.

Strategic and Structural Adaptation at NATO

As a consequence of the above discussions and findings, the idea of Smart Energy began to rise in prominence within the strategic and structural discourse at NATO.

In May 2012, Allied nations agreed at the Chicago Summit that "[…] we will work together towards significantly improving the energy efficiency of our military forces; […]". As a result, a concept for advancing energy efficiency within NATO was formally presented to Allied nations, who approved the launch of the Smart Energy Team (SENT) in October 2012. SENT then assumed the role of a steering group to help NATO integrate Smart Energy into the Smart Defence initiative.

At the same time, the Lithuanian Energy Security Centre, which had originally focused on traditional notions of energy security (i.e. addressing critical infrastructure protection and sustained energy supply for civilian purposes), added to its tasks to support NATO operations towards the development of solutions for energy efficiency. This additional task greatly helped the Centre in its accreditation process to become a NATO Centre of Excellence (ENSEC COE) in July 2012. At the time of accreditation, the ENSEC COE became a member of SENT.

Deliverables of SENT

One of SENT's key deliverables will be a comprehensive overview of existing or planned projects and best practices related to Smart Energy in force-contributing nations. The information will be analysed and the findings used to recommend and initiate Smart Defence projects leading towards cost-saving multi-national military capabilities. These will include NATO standardization agreements to ensure interoperability. ESCD's role in this process is three-fold: first, to facilitate the information exchange among all SENT members, NATO stakeholders and nations; second, to raise overall public awareness of the initiative; and third, to encourage multinational co-operation in advancing shared Smart Energy solutions.

Smart Energy at "Capable Logistician 2013"

The Smart Energy component presented at the military exercise "Capable Logistician 2013" was the first NATO-led multinational co-operation to demonstrate possible solutions for reducing fuel consumption. The showcased equipment and material was provided by three SENT nations: Germany, the Netherlands and United Kingdom.

[4] Congressional Research Service Report for [US] Congress "Department of Defense Energy Initiatives: Background and Issues for Congress", dated 10 December 2012.

[5] "Sustain the Mission Project: Casualty Factors for Fuel and Water Resupply Convoys" published by the Army Environmental Policy Institute (AEPI) in September 2009. The AEPI is an US governmental agency located in Arlington, Virginia.

Samples of solar cells on a standard Dutch tent at CL13

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With over 1700 participants from 38 nations, the exercise offered a unique opportunity to reach-out to a large number of military personnel from all three services and of different ranks. In addition, a "Distinguished Visitors Day" that took place on 20 June 2013 ensured high visibility among national and NATO leadership.

The main goal of the exercise, however, was to assess interoperability. The Smart Energy component was set up as one of 13 Multinational Integrated Logistics Units (MILUs) alongside Ammunition, Water Generation, Maintenance and Recovery, Movement and Transport, and Fuel, to name but a few. All these MILUs used equipment and procedures from different nations that have been standardized in accordance to NATO Standardization Agreements (STANAGs). By integrating the national capabilities, the strengths and flaws of STANAGs were assessed, while at the same time nations' confidence in each other's capabilities was strengthened.

NATO STANAGs are developed by dedicated NATO working groups comprised of suitable subject-matter experts. The draft STANAGs are then proposed to NATO's high-level committees for agreement by Allied nations. Once agreed, they are implemented by each nation within its own respective military. STANAGs have to be tested in real life exercises to ensure they are practical and well understood. The last exercise that assessed STANAGs for logistical purposes took place almost a decade ago. Hence, conducting a new exercise was more than timely, especially as knowledge, technologies and force-contributing partnerships have considerably changed during the past years.

The result of "Capable Logistician 2013" will be an evaluation report drafted by a dedicated Evaluation Cell and submitted to Allied nations for their consideration. The report will recommend which STANAGs to sustain and which to improve. Where deemed necessary, it will also suggest the development of entirely new STANAGs. SENT members will contribute to this report with their lessons learned.

The Smart Energy MILU was visited by over 500 exercise participants and visitors from 30 countries, including the Slovak President H.E. Ivan GAŠPAROVIČ, members of NATO's Military Committee and senior military leaders from allied and partner countries. Furthermore, NATO's Public Diplomacy Division published feature stories on Smart Energy and the "NA-

Monitoring of energy in Dutch tent at CL13
© NATO/SMic

TOChannel.tv" will soon release a short video clip about the Smart Energy MILU[6]. Independent press and media, mainly from the Slovak Republic and the Czech Republic, covered Smart Energy in Internet based news stories and video. Thus the exercise "Capable Logistician 2013" was a great opportunity to raise awareness of an emerging need for smart energy solutions.

The equipment and material showcased at the Smart Energy MILU helped to create a better understanding of the need for interoperability. It included solar cells, light emitting devices (LEDs), a hydrogen fuel cell, an insulated tent, and an intelligent energy storage and distribution management system.

- The Royal Netherlands Army showcased samples of solar cells and energy-saving LEDs that were installed in October 2012 in Mazar-e-Sharif, Afghanistan[7]. At the Smart Energy MILU, 6 strips of solar cells covering 12 m^2 were placed on the roof of one standard tent and on the ground. Under good weather conditions, they were able to produce about 10 kWh per day during daylight. The tent was lit by LED lights consuming about 1.2 kWh per day. Hence, there was a surplus of 8.8 kWh per day that was fed into the Slovak power grid from where it was distributed to all electricity consumers of the exercise.
- The Fraunhofer Institute for Chemical Technology (ICT) Pfinztal, Germany, presented a prototype of a portable hydrogen fuel cell producing 2 kW of electricity that the Institute developed together with the company Future GmbH for the German Bundeswehr. During the exercise, the fuel cell powered small equipment, including laptops, cell phones, a water kettle and a fan.
- The British DESTECH Technology Delivery Logistics Systems located in Bristol (under the Ministry of Defence) set up a standard military tent lined with insulated material that reduces energy consumption when cooling or heating is needed. Furthermore, an intelligent power storage and management system comprised of rechargeable batteries and a

[6] NATO stories are available at <www.nato.int> under the 'Newsroom'. NATO video clip are available at <www.youtube.com/user/NATOCOMMUNITY>.

[7] In Mazar-e-Sharif, 480 m^2 of these solar cells are currently producing 200 kWh per day. The Return of Investment (ROI) was 9 months. The LEDs that have replaced standard light bulbs are consuming about 50% less and their ROI was 4 months.

control unit was showcased. The system stores surplus energy from diesel generators and renewable energy producers. It then distributes the energy in an intelligent way when and where needed. The system was tested in Wales, Cyprus and Kenya under the British-Canadian project "POWER Forward Operating Base" (POWER FOB) where it reduced the fuel consumption by an average of 30%.

All Smart Energy power producing and consuming devices were equipped with standard military connectors, thus offering easy "plug & play" opportunities. However, with the exception of solar energy being fed into the Slovak power grid, interoperability of the systems was not tested because power consumption outweighed power generation. Furthermore, some devices on display were prototypes and not ready to be used beyond the purpose-built set-up, meaning that they could not be used or powered without special training by the manufacturer.

One of the main lessons learned was that for ensuring interoperability, all essential parameters of power production and consumption must be available prior to the set-up. A plan that balances production and consumption is key and the goal should be to optimise this balance. The challenges of having the right connectors, adapters and converters at hand to connect military equipment to the national power grids of host nations could easily be overcome once information is provided during the planning phase.

True interoperability, however, can only be achieved with a common concept for a Microgrid, allowing the combination of diesel generators with renewable energy source, energy efficient consumers and intelligent power management.

The Way Ahead for Smart Energy within NATO's Structure

Following the lessons learned at "Capable Logistician 2013", SENT recommends drafting a new STANAG on Smart Energy, encouraging nations to consider the integration of Microgrid equipment in the planning and implementation phase of deployed camps. Ideally, such a new STANAG should define:

- The installation of smart meters in existing camps and, based on the gathered data, the optimization of the balance of energy production versus consumption, if possible by installing a Power Management System or developing a full Microgrid;
- A common design for Microgrids for future deployed camps allowing the integration of renewable energy production, smart meters, energy efficient consumers and intelligent power storage and management;
- The training and engagement of experts in the planning, installation and running of Microgrids to help optimise the balance of energy production versus consumption and estimate the cost and Return of Investment (ROI);
- Common training on all aspects of energy efficiency in the military to be included in the general curriculum of military personnel;
- A recognition scheme for experts and commanders involved in fuel savings (based on data obtained through energy performance measurements).

Producing such a STANAG on Smart Energy at this early stage would help nations to advance their own national projects on new capabilities with a focus on interoperability. If nations were to agree to follow the SENT recommendation, they would give NATO the mandate to develop the STANAG and provide the required subject-matter expertise.

In fact, some work on energy efficiency is already being undertaken within NATO's structure. For example, NATO's Science and Technology Organisation is facilitating studies by subject-matter experts on a range of energy related issues, including "Fuel Cells and other Emerging Man-portable Power Technologies", "Electric Military Vehicles and Large Battery Packs", and "Power and Energy in NATO Operations". The findings will be available as written reports.

NATO's added value in this area is to ensure that the knowledge of subject-matter experts is meaningfully gathered and made visible. Ultimately, it will help to add knowledge to the process of developing NATO policies, common capabilities and best practices. While SENT is focusing on bringing subject-matter experts and NATO stakeholders together, raising the visibility of energy issues and recommending multi-national Smart Defence projects, other NATO bodies, such as the Defence Investment Division and the Defence Policy and Planning Division, will take the lead in advancing capabilities and policies. The NATO Energy Security Centre of Excellence (ENSEC COE) in Vilnius, Lithuania, and the Military Engineering Centre of Excellence (MILENG COE) in Ingolstadt, Germany,[8] are assisting the Alliance by drafting policies, developing training courses and facilitating concept & experimentation conferences.

For example, following an invitation by NATO's Logistics Committee, the MILENG Working Group, with the support of the MILENG COE, is developing a policy on power generation for deployed force infrastructure that will address energy efficiency and become the basis for identifying better ways to reduce the logistics footprint of fuels. The document will be presented to NATO's Military Committee by the end of 2013.

In conclusion, under Smart Energy, NATO pools together knowledge and expertise to allow the Alliance to obtain an overview of developments and key activities of relevance in the area of energy efficiency. This is necessary because at present relevant information is not centralised which makes policy development difficult. The involvement of subject-matter experts ensures that guidance provided to the Alliance for advancing interoperable capabilities in the area of energy efficiency is based on facts and realities in the field. Recent activities prove that the topic is of relevance to nations and that a mind-set change has already begun.

A British representative of the Ministry of Defence demonstrates the atmospheric water generator (a machine taking water out of the air). The machine produced during the CL13 in Slovakia 15 l drinking water per hour using 5 kWh.
© NATO/SMic

[8] These Centres of Excellence are multinational organisations accredited by NATO. They are members of the Centre of Excellence network coordinated by Headquarters Supreme Allied Command for Transformation (ACT) in support of NATO, the COE's sponsoring nations and other customers. They are not a part of the formal NATO Command Structure.

Polish Energy Security Policy – A New Approach is Needed

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Poland puts a large emphasis on energy security: this has been proved in adapted in April this year the Development Strategy of National Security System (SRSBN). In the last years a number of new solutions were introduced, aimed at the nation's adaptation to contemporary threats. For example, a new system for military fuel reserves was established. Unfortunately, alternative energy projects in the Armed Forces are still disappointingly low on the agenda. Therefore, a new and more flexible approach is urgently needed not only in the civilian but in the military sector as well.

Some changes but with old habits

Poland changed its approach to national security in the past few years and, in consequence, also its management system. The decision makers used the premise that "counteracting all potential security threats requires the possession of an integrated national security system"[1]. As a result of the integration of the SRSBN with other development strategies, the exclusion of certain aspects from the subject field of national security, including energy-related field took place. The issues of Poland's energy security, including the military aspects, are included in the strategy project titled *"Energy security and the environment" ("Bezpieczeństwo energetyczne i środowisko")*. The Ministry of Economy in Warsaw is the coordinator.

That does not mean that the SRSBN, adopted by the government in April 2013 – and a result of 3 years of works – does not cover the issue of Poland's energy security (both civilian and military) at all. These aspects are part of a third objective which is aimed at the development of defense capabilities in case of a threat, including crisis and unexpected international and national situations. This objective will be realized mainly by strengthening the critical infrastructure and building a system of strategic reserves. A vital aspect in the coming years will be a deeper cooperation in EU and NATO.

The fact that Poland produces as much as 90 percent of its electricity from coal is a painful illustration of Polish conservatism and little modernity. Currently, only 2 percent of produced energy is considered "clean". This figure is to rise to 15 percent in 2020.[2]

It is undoubtedly pleasing that Poland is aware of its energy security and that it keeps trying to improve it. Actions taken in the past few years and presented below prove this. Unfortunately, Polish decision makers are too conservative in their actions – both civil and military. As one may conclude from the above analysis, they are concentrated almost only on conventional resources: oil and natural gas. When it comes to new energy sources, the only works in progress are those on shale gas which is, however, hard to be considered as an alternative and renewable energy source.

Such conservatism of the Polish decision makers translates into the military scope. Official perspective is as follows: "Currently, the Polish Armed Forces are not conducting research on alternative fuels. The experience of countries participating in working meetings within the Fuel Committee in Brussels shows that there are problems while operating biofuels-

[1] *Strategia Rozwoju Systemu Bezpieczeństwa Narodowego RP 2011-2022 (Development Strategy of National Security System 2011-2022)*, p. 3: adopted by an act of the Council of Ministers, April 9th, 2013.

[2] K. Krasuski, *Poland Plans to Cut Subsidy for Renewables as Deficit Grows*, "Bloomberg", 09/04/2013. [www.blomberg.com]

powered equipment. Our climate zone makes the use of biofuels by the Polish Armed Forces unjustified, both economically and in application in a modern battlefield".[3] The correspondence with the most important military institutions – e.g. the Air Force ("we do not know anything about such plans")[4] or the Armament Policy Department of the MoND ("this subject matter does not cover the department's tasks")[5] constitutes a sad image: energy security – especially in the scope of the so-called operational energy security, alternative energy sources and the application of "waste for energy" technologies – are not subject to deep analyses and research works within the Polish Armed Forces (naturally, they are not the ones accused, the political decision makers who impose specific courses of action are to be blamed).

Poland's current large inactiveness could be explained, provided that its allies were not involved in similar works but reality proves otherwise. For example, in 2012 the US Air Force used 283 million kilowatt hours of renewable energy[6] whereas NATO promotes „alternative energy sources and developing multinational "smart energy" projects[7] very actively.

Works with limited scope and scale, mostly theoretical, are being conducted at the Military University of Technology in Warsaw (*Wojskowa Akademia Techniczna*) – mainly in the scope of energy storage (as much as possible in a minimal possible volume), hydrogen cells, renewable energy, voltaic and photonic cells, wind energy.[10] Nevertheless, this is not enough to admit that Poland is conducting active military works in this field. Unfortunately, small investments in innovative branches of technology are still a large problem for Poland and Polish science.

Due to the fact that alternative energy projects (especially for military purposes) are really low on the agenda this article will focus on more extensive part of current Polish energy policy. In a first part I will present Polish approach and legal solutions on reserves – also for the Armed Forces. In Poland this is the most important element, or at least one of the most of them, of energy security. Second part of this article will touch upon future developments planned currently in Poland – they mainly focus on building new facilities in order to secure a safe flow of energy supplies in case of a crisis. It will illustrate that Poland still concentrates on conventional energy resources and by energy security it means a security of supplies mainly of oil and natural gas.

Reserves in the event of a crisis

An effect of the introduction of the integrated approach to security is the unification of strategic reserves: civil and military. Based on the Act of the 29th October 2010 (valid: 5th February 2011) regarding strategic reserves, Poland altered the classification of reserves and the rules governing the entire system.[11] The new act introduced one type of reserves instead of two: economic (*gospodarcze*) and mobilization (*mobilizacyjne*). Therefore it had a direct influence on the so-called mobilization reserves to perform the tasks related to national security and defense. Changes also influenced the armed forces (*Siły Zbrojne RP*) which are

While NATO announces in an official statement that „a growing dependence on oil and gas, the progressive exhaustion of fossil fuels, constant increases in the price of raw materials, threats to the security of energy supplies and concerns about the consequences of climate change make energy security a major issue" and the American Department of Defense is seeking to develop solar, wind, geothermal and other renewable energy sources,[8] Poland's activity in such fields is limited only to the works of the civilian National Centre for Research and Development (NCBR) which is conducting the strategic program called "Advanced energy acquisition technologies" (*"Zaawansowane technologie pozyskiwania energii"*), consisting of works on: fuel and energy production from coal (black and brown), waste and biomass (Poland's most popular renewable-energy source); raising the energetic efficiency of coal plants; oxy-combustion. Smart grids are also being analyzed. The NCBR assigned EUR71 million for this program.[9]

3 Quote from e-mail reply from the press officer of the Ministry of National Defense, dated 23rd July, 2013.

4 Based on e-mail reply from the press officer of the Air Force, dated 15th July, 2013.

5 Based on e-mail reply from the MoND's Armament Policy Department, dated 17th July, 2013.

6 J. Elmore, *EPA Recognizes Air Force Renewable Energy Efforts*, "U.S. Air Force", 23/04/2013. [www.af.mil]

7 *NATO Armed Forces Embrace Renewable Energy*, „Environment News Service", 11/07/2013. [www.ens-newswire.com]

8 Ibidem.

9 Based on e-mail reply from the NCBR, dated 19th July, 2013.

10 Based on e-mail reply from the press officer of the Military University of Technology, dated 16th July, 2013.19th July, 2013.

11 The Act replaced the May 30th 1996 act of national reserves.

an important consumer of liquid fuels. That may be illustrated by the 2012 consumption in Polish Armed Forces of 75.383 tons, of which 15.769 tons in the land forces.[12]

In consequence, Poland resigns from the duality in the reserves system by introducing a system in which strategic reserves exist without dedication for particular ministries. The main institution for the development of the Governmental Program of Strategic Reserves (*Rządowy Program Rezerw Strategicznych*) is the Ministry of Economy.[13] This department has become the sole body authorized to create reserves, grant an access and close them. As mentioned before, the creation of the strategic reserves system, based on one type of reserves, has been regarded as an important goal of the SRSBN.[14] Reserve programs are devised for 5 years. The latest of them covers the period of 2013-2017.

Element	Old system	New system
Type of reserves	1) Mobilization 2) Economic	Strategic
Bodies authorized for creation	Many: ministers, central office managers and voivodes.	Minister of Economy
Basis for creation	Demand of departments submitted to the Minister of Economy	Governmental program for strategic reserves, adopted by the government
Responsibility	Dispersed	Minister of Economy

Table1: Evolution of Poland's approach to supply of resources – including energy
Source: Author

What is the objective of these activities? The supporters believe, and they must be given some credit, that an integrated, coherent system is better and more feasible. That allows the elimination of the poor information exchange between different institutions, introducing coordination and thus increasing the effectiveness of the entire system. In case of a crisis, also a possible war, when the armed forces were to be used – independently or with NATO assistance – cohesion and system integration will be extremely important.

Although the leading role has been assumed by the Ministry of Economy, that does not mean that the armed forces – so then also the Ministry of National Defense – do not have influence on strategic reserves policy. Particular departments have been ensured the right to submit propositions for accumulating particular reserves and their quantity to the Ministry of Economy. The executive institution is the Material Reserves Agency[15] (*ARM – Agencja Rezerw Materiałowych*) which purchases determined amounts of supplies, stores them and signs the so-called readiness contracts (*umowy gotowości*). The Governmental Program for Strategic Reserves currently involves: the Ministry of Defense, the Ministry of Internal Affairs and Administration, the Ministry of Agriculture and Rural Development, the Ministry of Justice, the Ministry of Infrastructure, the Ministry of Health, the Director of the Internal Security Agency and 15 voivodes.

Energy reserves

A crucial element of strategic reserves are energy resources reserves. The details of the Polish policy in this matter may be found in *"The act of 16 February 2007 on stocks of crude oil, petroleum products and natural gas, the principles of proceeding in circumstances of a threat to the fuel security of the State and disruption on the petroleum market (Journal of Laws 2007, No. 52, item 343 as amended)"*.[16]

[12] Data received on 5th June 2013 from the Ministry of National Defense.

[13] Data received on 22nd May 2013 from the Ministry of National Defense.

[14] Strategia rozwoju…, p. 74.

[15] More information available on the website of the Material Reserves Agency: http://eng.arm.gov.pl

[16] Available at: http://eng.arm.gov.pl/ftp/1/act_stocks__of_fuels_06.09.2012.pdf

According to this document, Poland includes the following items as energy resources playing crucial role in the national security: liquid fuels (motor spirits and aviation fuel, diesel oil, jet-fuel of the kerosene type and other light fuel oils, heavy fuel oils), liquid biofuels, LPG (liquefied light hydrocarbons: propane, butane or their mixture, used as propelling fuel or for heating purposes), natural gas (in all physical states, including liquefied natural gas and compressed natural gas).[17]

As the European Union's and NATO's bordering state, Poland would be the first (or one of the first, taking into account a possible aggression on Lithuania, Latvia or Estonia) victim of an aggression from the east. Irrespectively of whether the allied NATO states would come to help and, as a result, Poland would launch the NHS procedures, or not, Polish armed forces and civil defense units would need supplies of energy resources for continuous action. Therefore a preparation of supplies on the country's territory is vital, as in case of a negative scenario the supply lines would be paralyzed by the aggressor which would disable the ability to import resources from other countries quickly. Such energy resources are crucial from the Polish point of view, also in situations other than a war – during natural disasters, economy and political crises (including: cutting off the flow of resources during peace) or a technical failure.

Having the awareness of potential threats which could result negatively on the energy security and supplies, Poland established a system of maintaining fuel reserves in case of a crisis. They are called "intervention stocks", consisting of the following:

- Compulsory stocks of crude oil and fuels, established and maintained by producers and traders (known as "the compulsory stocks of crude oil and fuels");
- State stocks of crude oil and petroleum products (known as "the state stocks of crude oil and petroleum products"), established by the minister competent in the matters of economy and maintained by the Material Reserves Agency.

According to the Polish law, the intervention stocks should meet the demand for crude oil and petroleum products in quantities corresponding to at least:

- The 90-day average internal daily consumption of crude oil and petroleum products except for liquefied petroleum gas (LPG);
- The 30-day average daily internal consumption of liquefied petroleum gas (LPG).

It is also stated that "the fuels of which intervention stocks are accumulated should meet quality requirements set forth in the provisions on the system for quality monitoring and inspection of fuels" however "as part of intervention stocks, it is permitted to maintain stocks of motor spirits, liquefied petroleum gas and diesel oil which do not meet the requirements for vapor pressure and the cold filter plugging point for particular periods of the year as laid down in the provisions on the system for quality monitoring and inspection of fuels".[18]

By 31 March of each year, the minister competent in the matters of economy declares, by way of announcement in the "*Monitor Polski*", the following quantities:

- The average net daily amounts of crude oil and petroleum products brought into Poland;
- The average daily production of fuels,
- The average daily internal consumption of crude oil and petroleum products - for the preceding year, based on statistical data.[19]

[17] *The act of 16 February 2007 on stocks of crude oil, petroleum products and natural gas, the principles of proceeding in circumstances of a threat to the fuel security of the State and disruption on the petroleum market*, p. 1.

[18] Ibidem, p. 3.

[19] The last proclamation was published on April 5th, 2013.

Table2:
Daily internal consumption of energetic resources in Poland (2012)[20]

Source: The Economy Minister's proclamation from 5th April 2013 concerning the average net daily import of oil and oil-related products, average daily fuel production, average daily internal oil and oil-related products consumption in 2012 "Monitor Polski", April 18th, 2013, p. 3

Resource	Consumption (tons)
Oil	68120
Engine gasoline and propellants for aircraft engines	9990
Diesel fuel for engines and propellants for aircraft engines based on kerosene and other oils	34710
LPG	6100

Producers and traders are obliged to accumulate and maintain the compulsory stocks of crude oil and fuels (motor spirits and aviation fuel, diesel oil and jet-fuel of the kerosene type and other light fuel oils, heavy fuel oils, liquefied petroleum gas (LPG). The volume of compulsory stocks amounts to:

- 76–day average daily amount of crude oil and fuels brought in or the amount of fuel production, except for liquefied petroleum gas (LPG);
- 30–day average daily amount of liquefied petroleum gas (LPG) brought in or produced in the preceding calendar year.[21]

While domestic producers and importers are responsible for keeping stock for 76 days, the following 14 lies with the ARM (90 days in total). The current government wants this period to be extended by 2017 to 27 days of average daily consumption. The Ministry of Economy, taking pattern from Germany's solutions, is considering a project to assign accumulating all supplies to ARM, subject to the Ministry itself.[22]

Currently, there is a discussion in Poland regarding legal changes. The government has prepared a project of an amendment to the act for oil and liquid fuels supply, being an implementation of the EU directive 2009/119/WE that imposes an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products. The project assumes, among other, a triple raise of LPG reserves from 30 to 90 days of average internal daily consumption. This means a clash between national security on one side and the producers and importers on the other who point out the increase of costs by approximately EUR 46 million annually.[23]

It is worth mentioning that "the compulsory stocks of natural gas may be maintained outside the territory of Poland – in the territory of another member state of European Free Trade Association (EFTA) – a party to the agreement on the European Economic Area, in storage installations connected to the gas system".[24]

In case of emergency (for instance, a threat to the fuel security of the state, an unforeseen increase in the consumers' natural gas consumption, disruption of natural gas transport, a threat to the security of gas grid operations etc.) restrictions on the consumptions of natural gas may be imposed within the territory of Poland or a part thereof for a specified period of time.

Future development

For Poland, energy security (that of supplies and transfer network) is extremely crucial as the state is mainly dependent on external supplies. This concerns oil in particular. While in the case of natural gas, Poland is able to satisfy one third of domestic consumption with its own reserves and production, oil is mainly imported (of which 90 percent from Russia).[25] This fact has an extremely disadvantageous influence on Poland's security, as in the event of a crisis

[20] The Economy Minister's proclamation from 5th April 2013 concerning the average net daily import of oil and oil related products, average daily fuel production, average daily internal oil and oil related products consumption in 2012 „Monitor Polski", April 18th, 2013, p. 3

[21] *The act of 16 February 2007*…, p. 4.

[22] P. Wrabec, *90 dni spokoju*, „Polityka.pl", February 13th, 2012. [www.polityka.pl]

[23] *Polska Organizacja Gazu Płynnego apeluje do rządu i posłów*, „POGP", June 2013. [www.pogp.pl]

[24] *The act of 16 February 2007*…, p. 14.

[25] A. Zagrodzki, *Solna polisa*, "Polityka.pl", December 27th, 2011. [www.polityka.pl]

disruptions in transfer may occur. This forces the Polish governing bodies act in order to limit this disadvantageous situation.

That is why Poland puts a large emphasis on creating a well-developed national system ensuring energy security – also in the scope of strategic reserves in case of emergency. The Naftoport may be an example – a terminal for oil and fuel (34 million tons annually) in the Port Północny (Gdańsk) and the Rurociąg Północny northern pipeline which can transfer oil between Gdańsk and Płock (Orlen refinery). Poland invests in transport and accumulation capabilities. A larger coordination on the European Union and NATO forum is planned.

Further investments and a better coordination are crucial. The problems pointed out in 2007 support this idea. The Polish press alarmed then that the oil reserves exist only on paper. Most of the Polish supplies were accumulated in the old Solino salt mine (350 meters underground, 5 million metric tons) which would be hard to quickly and efficiently extract.[26] Since then new containers were created – e.g. two oil tanks, 100 cubic meters each in Adamowo (close to the Belarus border).[27] In March this year, the Ministry of Economy expressed its will to build an Oil Terminal in Gdańsk (until 2015) with a capacity of 700 thousand cubic meters (of which 400 thousand for oil). The needs are not satisfied yet. At the end of 2011, it has been estimated that there is a deficit of tanks in Poland, amounting to approximately 7 million cubic meters. This also applied to natural gas storehouses. Large hopes are linked to the LNG import terminal Świnoujście with a projected capacity of 7.5 billion cubic meters per annum. As of July 2013 the project is almost 65% complete.

Recommendations

If recommendations were to be presented, firstly Poland should (no doubt) more actively engage itself in development works on "waste for energy" technologies or alternative energy sources (including "green energy"), not only for the civil industry, but also for the armed forces' needs. The top (political decision makers) sets the example. As the budget disposers they decide which directions are priorities. That is why they should finance and promote civilian and military projects and studies related to new energy sources. Higher subsidies and tax deductions for companies could be a chance to increase the popularity of such investments.[28] It is crucial to understand that new energy sources can be very beneficial – a technological jump for the economy, development of science and business and also improve national energy security – both during peace and crisis/war (for the economy and armed forces). A national awareness-raising program on renewable energy may be necessary, since the Polish are conservatives used to their rote behavior – controversy over the act of 2013 imposing waste sorting is a perfect illustration.

What is more, Poland should start more active cooperation with its NATO allies to use their experience – on the governmental, ministerial and lower levels (research facilities, General Staff and all branches of the Armed Forces). This will allow to increase knowledge and also train professional and technical personnel (by taking part in courses, seminars, debates and study visits). Poland should immediately start actual and close cooperation with the Vilnius-based NATO Energy Security Centre of Excellence (an irony of fate: General Mieczysław Bieniek, the then-Deputy Supreme Allied Commander Transformation, on behalf of NATO signed the documents that established this entity in 2012). The experience gained by the center and the possibility of international contacts with experts in energy would be very valuable and necessary. Thus, it is hard not to be disappointed that Poland – a member of NATO since 1999 – appears to be ignoring the center's existence.

[26] *Rezerwy ropy Polska ma tylko na papierze*, „Gazeta.pl", October 17th, 2007. [www.gazeta.pl]

[27] A. Zagrodzki, op. cit. Except for Adamowo tanks, the PERN company (deals with the oil storage and oil pipelines transporting oil from Russia for fuel producers in Poland and Germany) has an oil base near Płock, also in Gdańsk (close to the Naftoport). Their total capacity is almost 3 million cubic meters.

[28] Poland estimates that the cost of state support for renewables will rise to EUR3.4 billion in 2020. K. Krasuski, op. cit.

Are There Any Opportunities for Adding A Critical Energy Infrastructure Protection Aspect to NATO Training Excercises In Europe?

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On 22-24 January 2013 the Main Planning Conference for the Steadfast Jazz 2013 (SFJ), which is due to take place in November 2013, was held. The SFJ will be the first training of a joint NATO response with respect to aggression against a member of the Alliance in the Baltic region. It is also the biggest NATO exercise since the end of the Cold War being conducted alongside Baltic Host, which is a Host Nation Support exercise for the Baltic States. The exercise will test the command and control structures of the NATO Response Force (NRF), and in addition it presents a perfect opportunity to develop military preparedness and civil-military cooperation with regards to the critical energy infrastructure protection matter. How is this opportunity being explored? Who are the possible players and developers of suggestions related to the critical infrastructure protection aspect within the current settings and scenarios for this exercise?

New Security Risks in Northern Europe Revealed

"The security situation in Europe is more secure than ever before" is quite often heard from politicians, officials and experts. "The probability of a conventional war on European soil is lower than ever." They are probably right, but not everyone concurs with this statement to the fullest extent.

The public discussion in Sweden and Finland regarding the new security situations and threats, in addition to consideration on joining and collaborating with NATO, are increasing, with there being several reasons for this. Both states are already collaborating significantly with the Alliance on the peace keeping mission as they have acknowledged that instability is a common threat. But that's not where it ends.

Addressing Critical Infrastructure Concerns in Finland

Recently, in the aftermath of the release of the 2012 Finnish government report "Finnish Security and Defence Policy"[1], where the importance of energy security and critical energy infrastructure protection was pointed out several times, some discussion has taken place in the Finnish media. In the telecast "MOT" on YLE TV, the vulnerability of the electrical grid was dissected by three noted experts, a former head of the Technical Supervision Department at the Finnish ARMY HQ Olli Savaranta, the head of the Finnish Main Grid, FINGRID, Reima Päivinen and the head of the Finnish accident investigation centre Veli-Pekka Nurmi.

[1] Government Security and Defence Policy Report submitted to Parliament, 12.20.2012: http://formin.finland.fi/public/default.aspx?contentid=265857&contentlan=2&culture=en-US

As explained by Nurmi, if the electrical grid was to be put out of action, public transport would stop, most of the banks and shops would be closed, and the traffic lights and road lighting would go out. The hospitals and emergency centres would be able to function on emergency generators for six days. If it were winter time, the non-functioning heating systems would mean numerous casualties. The water and sewer systems would also stop functioning.

The scheme (Figure 1) below drafted using some of the insights of the authors of the mentioned Position Paper (November 2011) reflects on the interrelations between a blackout and selected consequences:

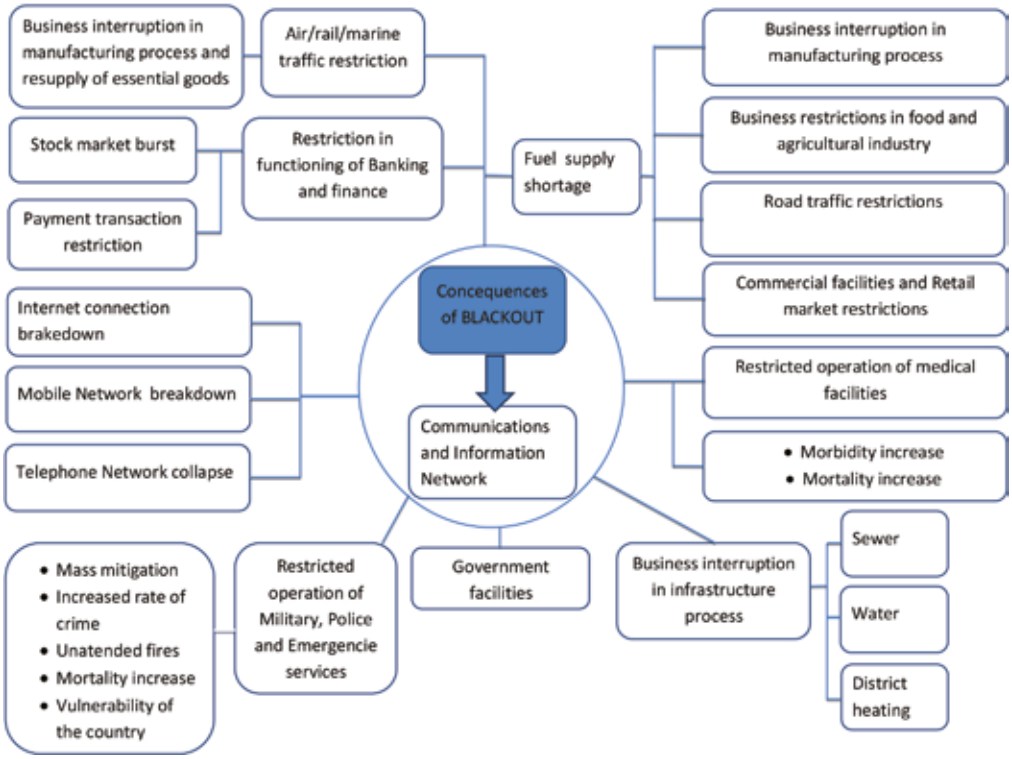


Figure 1:
Selected Consequences of Power Blackouts
Source: Author

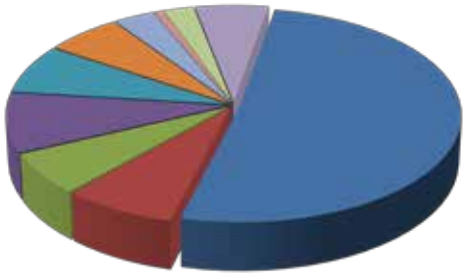
The conclusion of the discussion was that the Finnish power system can be destroyed for a long period of time in 15 minutes by a professional group of 3-8 saboteurs or Iskander-M rockets stationed near the Finnish border. Savaranta pointed out that an attack on the energy infrastructure is more likely to happen than a conventional act of war against Finland, which is mainly considered as a threat by the defence authorities.

Moreover, a cyber-attack could shut down the entire power system for a long period of time, because even though the attack might be cyber, the physical destruction could be compared to that of a massive airstrike – as was witnessed in the Iranian nuclear facilities being attacked with the worm "Stuxnet". According to US-CERT, the number of cyber-attacks and cyber-attacks on energy infrastructure are increasing rapidly, representing a growth exceeding 383% from 2010 (41 incidents) to 2011 (198 incidents).

Figure 2:
Summary of Total Incidents Reported to US CERT in FY 2011

Source: Fiscal Year 2011 - Report to Congress on the Implementation of The Federal Information Security Management Act of 2002", Office of Management and Budget, March 7 2012, http://www.whitehouse.gov/sites/default/files/omb/assets/egov_docs/fy11_fisma.pdf (accessed September 28, 2012)

Phishing	55.153	51,2%
Virus/Trojan/Worm/Logic Bomb	8.236	7,7%
Malicious Website	6.795	6,3%
Non Cyber	9.652	9,0%
Policy Violation	7.927	7,4%
Equipment Theft/loss	6.635	6,2%
Suspicious Network Activity	3.527	3,3%
Attempted Access	863	0,8%
Social Engineering	2.573	2,4%
Others	6.294	5,8%



But military and terrorist attacks among with cyber threats are not the only ones to cause black-outs. The spectre is wide, consisting of several different natural hazards, from floods to electromagnetical storms, but also technical failures and human errors, that can cause massive disruption to electrical system.

The scheme (Figure 3) below, which partly incorporates the insights of the authors of a Position Paper (November 2011)[2]: "Power Blackout Risks. Risk Management Options. Emerging Risk Initiative" reflects on the interrelations among possible events resulting in a blackout.

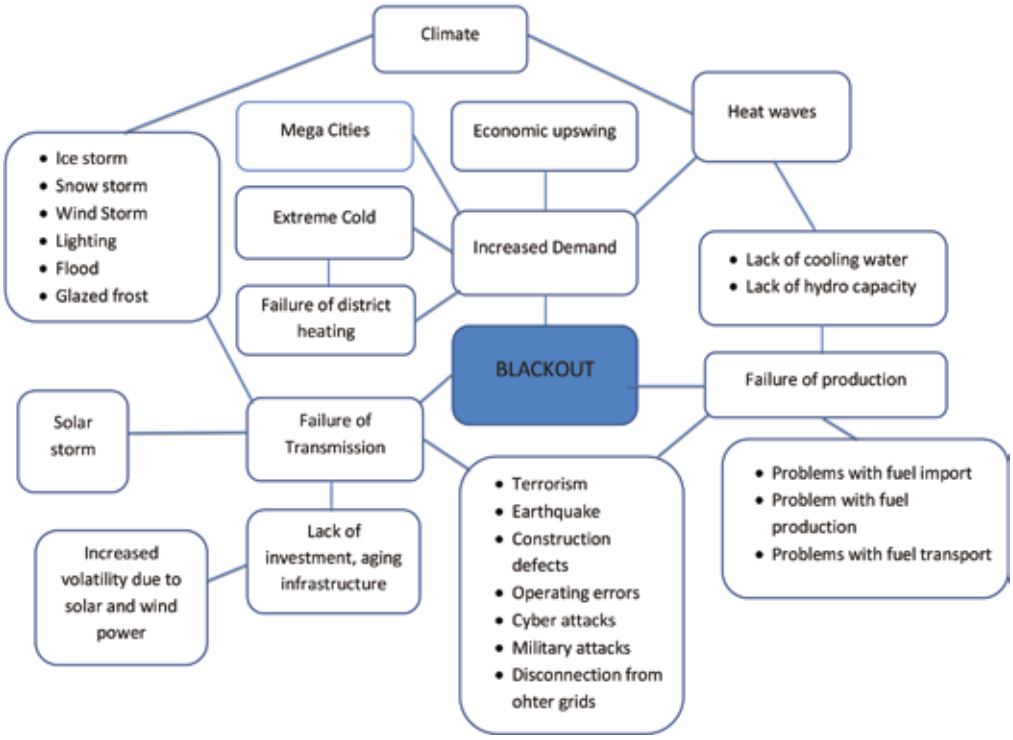


Figure 3:
Potential Causes of Power Blackouts

Source: Author

Why is this important to NATO and the Armed Forces?

A war operation in a developed country that has been severely crippled by non-functioning infrastructure is very similar to a conflict in an undeveloped country. As so, a war in terms of resupplying goods in Northern Europe would be just the same as in the Afghanistan desert: no local infrastructure can be taken for granted; no Host Nation Support can be relied on. All of the fuel and food would have to be shipped or conveyed in and the electricity would have to be produced with portable generators or similar alternative methods.

[2] http://www.agcs.allianz.com/assets/PDFs/Special%20and%20stand-alone%20articles/Power_Blackout_Risks.pdf

The abovementioned consequences of non-functioning infrastructure require new innovative strategies. In this respect it should be mentioned that NATO is giving considerable thought to alternative energy resources and energy savings in the theatre of warfare in order to reduce reliance on local grids and resupply convoys which are vulnerable to attack. LED lightning, solar water heaters and PV cells, mobile wind generators, hydrogen and advanced battery technology is being worked on with ever-growing effort. But until now, this has been done with consideration to the southern theatre of war for dealing with anti-guerilla warfare with expeditionary forces. However, whether these solutions are suitable for operations in the North, in the case of mass scale conventional warfare and the need to provide adequate supplies for the local civilian population, is questionable.

An additional difference is that in developing countries the society and individuals do not rely so heavily on commodities provided by the infrastructure, but in developed countries they do. As explained before, people in European countries sometimes rely with their lives on the infrastructure. Thus, one of the first concerns for the military must be to help the civilian authorities avoid a humanitarian catastrophe. Providing shelters, fuel, food, water, heating in the winter and waste management in summer, in addition to medical care, emergency response and the protection of law and order are situations in which a lot of resources must be considered.

NATO has already identified the protection of transport on maritime routes in its operational plans (for instance, operation Ocean Shield) in order to secure the uninterrupted transportation of vital gas, and gasoline commodities to the countries in need of these resources. It has been identified that the uninterrupted functioning of these maritime routes is essential for both the normal functioning of a country's economy and also for the normal functioning of civil society.

In the case of a collapse of the functioning of infrastructure, at the same speed as the military units, engineering units must be deployed on the operational field on a massive scale in order to produce bases for the military effort to achieve two goals – providing for the war fighting units and also helping the local civilian population. But as these kind of large scale engineering units are not needed in peace time, collecting the sufficient amount of specialists and ensuring their interoperability in the completion of new tasks could prove to be a challenge. It's likely that reservists and private contractors would be involved in this endeavour.

On 15 of July, 2013, in Greece, a NATO conference "Future Security at sea – MIO Roles" was held. The threats to maritime energy infrastructure were considered, amongst others threats posed by Terrorists and Pirates were considered, but also keeping the Strategic Chocepoints open for marine transport, proveing it to be a ever growing issue for NATO forces.

Military Exercises based on "Skolkan" as an Opportunity to Jointly Address Energy Infrastructure Vulnerability

Several years ago, more precisely in January 2010, the Supreme Allied Commander Europe (SACEUR) commissioned, and since then NATO Joint Warfare Center (JWC) has designed a new exercise setting, codenamed "Skolkan", by creating a fictitious world embracing six new countries that occupy the High North region in Europe.

Creating Skolkan starts "from the development of maps, railway timetables and the biographies of influential individuals to encyclopaedic books that describe each of this fictitious world country in areas such as politics, military, economy, and society… A qualified team of six uniformed officers and 14 civilian contractors make up the JWC's Scenario Section"[3] stationed in Stawenger, Norway.

"The term Skolkan is a reference to the former Skolkan Empire that once ruled the High North… The former Empire that centred round the Torrike reached its pinnacle in the mid

[3] Reyes, Ronel. SKOLKAN: Scandinavia's Alter Ego. The Three Swords Magazine 21/2011, p. 5

19th century, and comprised of what are now the countries of Arnland, Framland, Bothnia, Otso, and Lindsey as well as having overlordship of Norway... Three of the countries would represent potential aggressor states to act as the "adversaries" in the exercise scenario. The role of a fourth country would be a non-member nation that is "friendly" to NATO, while the other country would represent a failing state. To round out the countries, a sixth nation was developed as a buffer between the exercise area and Russia, a NATO Partnership for Peace Nation… Sweden and Finland had graciously agreed to let their countries be divided into five of those nations. To create the final country, North Island New Zealand was brought up from the Southern hemisphere and transplanted approximately 50 km off the coast of Norway."[4]

The Skolkan as a setting will be used for the exercise, which envisages the application of Article 5 of the Washington Treaty in order to defend a NATO member nation and which enables interaction between the nations and the NATO Command Structure at all echelons. According to Colonel Carl Giles, United States Army, Chief Joint Exercise Division, Joint Warfare Centre (JWC) and Ms. Inci Kucukaksoy, Public Affairs Office, JWC, the Skolkan based scenario's "presentation of a robust and realistic full-spectrum adversary will challenge the Command and Control structure and uncover gaps in processes and capabilities that can then be redressed through training enhancement and, on a broader scale, through processes like Smart Defence and the Connected Forces Initiative… In addition to revisiting the challenges associated with conducting operations in and from the sovereign territory of NATO nations and the revealing of how imperative it is to partner with host-nation governments and military forces, Skolkan also allows for the integration of emerging challenges such as cyber-defence, ballistic missile defence and energy security into a complex training environment"[5].

The Steadfast Juncture Exercise held in Estonia in November 2012 was the first time the Skolkan based scenario had been used to certify the NATO NRF, and it proved to be a success[6].

Skolkan is also suitable for the NATO HQ Crisis Management Exercise (CMX) and allied Command Operations (ACO) nuclear exercise. In theory, the results and decisions from the strategic planning of CMX could then be further used during the major joint exercises such as the "Steadfast" series, thereby providing some continuity of training effort.

The next most important milestone for the Skolkan setting will be the Exercise Steadfast Jazz 2013 (SFJ), which will be held in the Baltic States and Poland, along with the Baltic Host 2013 (BH) exercise. SFJ will be next in a long list of "Steadfast" military exercises being conducted by NATO and is important for several reasons, the first being the fact that it is the largest NATO training exercise since the end of the Cold War. Almost 400 people participated in the Main Planning Conference (MPC) held at the Static War Headquarters, Castlegate, Germany, from 22 to 24 January 2013[7], demonstrating the importance of the event. Secondly, it takes place at a critical time when the Afghanistan mission, which has been the main driver for collective defence in Europe, is coming to an end. And thirdly, it is the first major NATO exercise since the Obama administration announced the so-called Asia Pivot and signalled that it would be significantly reducing U.S. troops in Europe[8].

4 Ibid, p. 6

5 Carl Giles, Inci Kucukaksoy. Transformation through Training at the Operational Level. NATO ACT homepage 01.2013: http://www.act.nato.int/transformer-2013-01/article-2013-1-12

6 NATO's Steadfast Juncture exercise ends in Estonia. Estonian Defence Forces. 08.11.2012: http://www.mil.ee/en/news/3739/nato's-steadfast-juncture-exercise-ends-in-estonia

7 1 JFCBS conducts Main Planning Conference for Exercise Steadfast Jazz 2013, Allied Joint Force Command Brussum, 24.01.2013 http://www.jfcbs.nato.int/jfcbrunssum/news_archive/2013-2/jfcbs-conducts-main-planning-conference-for-exercise-steadfast-jazz-2013.aspx

8 Luke Coffey. Steadfast Jazz 2013 and America's Commitment to NATO. The Heritage Foundation 24.04.2013: http://www.heritage.org/research/reports/2013/04/steadfast-jazz-2013-and-america-s-commitment-to-nato

During the Steadfast Jazz exercise, due to take place in November 2013, the command and control elements of NATO Response Forces will be tested. A portion of the military units and command and control elements assigned to the NATO Response Force will be fielded to the training areas in Estonia, Latvia, Lithuania and Poland for the period of SFJ. Up to 5000 soldiers will be involved with 2000 acting on the ground.[9] In addition, Exercise BH, traditionally a NATO forces reception, staging, onward movement and integration exercise with host organisations from the Baltic nations, has combined with SFJ to exercise military throughput and follow on force flow for the NRF. Held as a computer processed staff exercise, Host Nations Support Scenario (HNS) of the Baltic Host exercise will put the capacity of the states' infrastructure and agencies, in respect of receiving coalition forces, to test and make evaluations, as well as bringing forward a spectrum of problem situations to be solved collectively by civilian institutions. The goal of the exercise is to improve the cooperation between the Baltic defence sector and civilian institutions during HNS operations[10].

The role of ENSEC COE in the Further Development and Adaptation of the Skolkan Settings

The NATO ENSEC COE is in a position to contribute to the further development of the Skolkan settings and related military exercises scenarios through the incorporation of energy security aspects in order to make it closer to reality and address various important sides of the threats. Estonia, Latvia and Lithuania are situated directly in the centre of the region in question, with good connections to the Finnish and Swedish energy community. So the majority of the necessary know-how can be harvested in those states. What is more, the NATO Cooperative Cyber Defence Centre of Excellence, situated in Tallinn, Estonia, is in favourable proximity for providing especially close cooperation in the critical infrastructure protection field, taking into account the growing importance of cyber defence of energy infrastructure. Thus, complex, inter-related, life-like and regional specialities considering the settings and scenarios for military exercises could be produced and expanded to other regions. However, in this case the differences of each region in terms of geography, logistics, culture, intelligence, etc. should be taken into account.

The Need for Cooperation with the Authorities of Energy and Interior Affairs

After a scenario of an accident or emergency situation is produced, the national DCO-s and energy authorities can be asked to create near real-life situations that could occur or that would be probable in the case of a military operation in this region. If we consider the destruction of some substations in the electrical grid, pump stations in gas pipelines or the whole heating system in the capital of a country, the energy authorities could picture a real-life situation and its consequences, calculate the extent of the effect to the system, the loss of power and the size of unheated regions, as well as the resources needed for restoration and the time needed for this. Furthermore, they could calculate and indicate the most vulnerable hubs where the attacks could be played on. Also, as these organisations must prepare for this kind of events for themselves, it is a good place for them to practice the situation and prepare cooperation with the military and rescue units. Most of all, it gives them the opportunity to see and understand the real consequences behind the numbers and

[9] Collective defence war games in the Baltic region to involve 5,000 NATO soldiers. The Lithuanian tribune 22.04.2013: http://www.lithuaniatribune.com/34809/collective-defence-war-games-in-the-baltic-region-to-involve-5000-nato-soldiers-201334809/

[10] Print International Baltic Host 11 military exercise begins in Lithuania. The Baltic Course. 05.04.2011: http://www.baltic-course.com/eng/baltic_news/?doc=6981&ins_print

calculations, what kind of capabilities the military has and what kind of support the organisations must provide for the rescue and rapid recovery units.

It is essentially important to have scenarios that would have a great impact on the civilian population too, creating a true real-life demanding situation for the military troops. As the interior ministry has or is required to have the experience of what the consequences are and how the people react and also the number of people needing help, they are the foremost ones. Also, their participation in acting, asking for help and directing the operations of military units in this field is necessary in order to practice the cooperation between the military and the civilian authorities.

Besides helping to produce these kind of scenarios for the military to train for action in these situations and the cooperation between civil and government institutions, preliminary steps can also be taken to enable the energy or critical infrastructure to become more resilient all together: advanced rules for TSO-s, new building regulations which make the population less vulnerable to this kind of situations as well as relevant instructions for the military units to have suitable technical solutions for these occasions.

The Need for a Relevant Experience Integrator and Adaptor to New Contexts

To conclude, addressing energy infrastructure protection issues through their incorporation into settings, scenarios and the conducting of military exercises is a real challenge which implies the employment of various institutions and the coordination of a number of actions. If ENSEC COE assumes the function of a developer and adaptor of settings and scenarios for military exercises through adding a critical energy infrastructure protection aspect, it should be ready to devote considerable time and effort to the exploration and integration of relevant experience and adapt successful models into new contexts, taking into account the differences of each region, such as geography, logistics, culture, intelligence and others.

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