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11 February 2014

DOCUMENT
C-M(2014)0009
Silence Procedure ends:
17 Feb 2014 18:00

POLICY ON POWER GENERATION FOR DEPLOYED FORCE INFRASTRUCTURE **Note by the Secretary General**

1. Modern military forces are using large quantities of liquid fossil fuels during operations. A large quantity of these fuels is being used for power generation and heating in camp facilities. The need to move liquid fuels over long distances significantly increases the overall cost of this commodity, adds to potential adverse environmental impact, increases the logistical footprint and puts soldiers in convoys at risk. Further, the effort to protect the convoy diverts time and effort from other operational activity.
2. As a consequence and upon the request of the Logistics Committee, the NATO Senior Joint Engineer Conference developed a Policy on Power Generation for Deployable Force Infrastructure. Implementation of this policy should allow Allies and partners to reduce liquid fuel consumption and the logistical footprint when fielding Deployable Force Infrastructure in operational theatres.
3. The importance of a Policy for Power Generation for Deployed Force Infrastructure has been acknowledged by Allies in the Defence Policy and Planning Committee, in the context of the ongoing work on the Green Defence initiative. The attached policy is fully in line with and supports the efforts under the Green Defence initiative to make NATO a more energy efficient and environmentally sustainable organisation in its activities, including operations.
4. The Policy on Power Generation for Deployable Force Infrastructure was approved by the Logistics Committee¹ and Military Committee² and is now forwarded to the Council for its approval. I do not think there is a need to discuss the policy at Council level. Therefore, **unless I hear to the contrary by 1800 hours, on Monday, 17 February 2014**, I shall assume that the Council has approved it.



Anders Fogh Rasmussen

1 Enclosure

Original: English

¹ AC/305(EAPC)D(2013)0016 and AS-1
² MCM-0160-213

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NORTH ATLANTIC MILITARY COMMITTEE
COMITE MILITAIRE DE L'ATLANTIQUE NORD



21 January 2014

MCM-0160-2013

SECRETARY GENERAL, NORTH ATLANTIC TREATY ORGANISATION

POLICY ON POWER GENERATION FOR DEPLOYED FORCE INFRASTRUCTURE (DFI)

1. On 20 Jan 14, the Military Committee endorsed the Policy on Power Generation for Deployed Force Infrastructure (DFI), a copy of which is attached at Enclosure 1. This document is forwarded to the North Atlantic Council for their consideration and approval.
2. This document clears IMSWM-0353-2013, 18 Dec 13.

FOR THE MILITARY COMMITTEE:

A large, stylized handwritten signature in black ink, consisting of several overlapping loops and a horizontal line at the bottom.

Sir Christopher Harper
Air Marshal
Director General
International Military Staff

Enclosure:

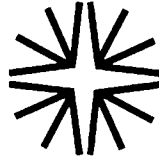
1. AC/305(EAPC)D(2013)0016-AS1, Policy on Power Generation for Deployed Force Infrastructure (DFI), 2 Dec 13.

Copy to: SDL T, IS DPP

Action Officer: Col. M.V. POPA, L&R (5474)

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EAPC
Euro-Atlantic Partnership Council



CP
Conseil de Partenariat Euro-Atlantique

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2 December 2013

DOCUMENT
AC/305(EAPC)D(2013)0016-AS1

LOGISTICS COMMITTEE (LC)

**POLICY ON POWER GENERATION FOR
DEPLOYED FORCE INFRASTRUCTURE (DFI)**

ACTION SHEET

Note by the Staff Officer

Reference: AC/305(EAPC)D(2013)0016, dated 18 November 2013

On 29 November 2013 following a silence procedure, the Logistics Committee (LC) agreed to the Policy on Power Generation for Deployed Force Infrastructure and the way ahead.

Note: This Action Sheet is part of and shall be attached to AC/305(EAPC)D(2013)0016.

(Signed) P. VAN EXEM

Original: English

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NATO HQ - QG OTAN

DMS 1994733

DOCUMENT

EAPC
Euro-Atlantic Partnership Council



CPEA
Conseil de Partenariat Euro-Atlantique

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18 November 2013

DOCUMENT
AC/305(EAPC)D(2013)0016
Silence Procedure ends:
29 Nov 2013 12:00

LOGISTICS COMMITTEE (LC)

**POLICY ON POWER GENERATION FOR
DEPLOYED FORCE INFRASTRUCTURE (DFI)**

Note by the Staff Officer

References: (a) AC/112(EAPC)DS(2011)0002, paragraph 8, 27 October 2011
(b) AC/305-D(2012)0004, dated 3 February 2012
(c) Letter DPP(2012)0129, dated 14 February 2012

1. Following the Petroleum Committee (PC) initiative aiming to reduce fuel consumption for power generation in base camps (reference (a)), the Logistic Committee invited the NATO Senior Joint Engineer Conference (NSJEC) to consider the development of a policy for power generation in base camps, the so called Alternative Operational Energy solution (references (b) and (c)).

2. As a consequence, the NSJEC developed a draft Policy for Power Generation for Deployed Force Infrastructure which was endorsed by NSJEC on 9 October 2013 and has been forwarded to the LC for further consideration (Enclosure 1).

3. The importance of developing the Policy for Power Generation for Deployed Force Infrastructure has already been well acknowledged by Allies in the Defence Policy and Planning Committee, in the context of the Green Defence initiative (AC/281-N(2013)0074). This Policy is fully in line and supports the efforts under the Green Defence initiative to make NATO a more energy efficient and environmentally sustainable organisation in all of its activities.

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4. The LC is invited:
- 4.1 to agree the draft Policy for Power Generation for Deployed Force Infrastructure at Enclosure 1;
- 4.2 once agreed by the LC, to send it to the Military Committee (MC) and North Atlantic Council (NAC) for their final approval.
5. Accordingly, unless the Staff Officer (vanexem.philippe@hq.nato.int) is notified to the contrary **by 12:00 hrs on Friday, 29 November 2013**, it will be assumed that the LC has agreed to the Policy on Power Generation for Deployed Force Infrastructure and the proposed way ahead.

(Signed) P. VAN EXEM

Enclosure

1. 5000/TSC FCL 0150/TT9886/Ser:NU0700, dated 25 October 2013

1 Enclosure

Action Officer: Mr. P. Van Exem, Ext. 4564
Original: English

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NORTH ATLANTIC TREATY ORGANISATION
ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD
HEADQUARTERS, SUPREME ALLIED COMMANDER TRANSFORMATION
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ENCLOSURE 1
AC/305(EAPC)D(2013)0016



5000/TSC FCL 0150/TT9886/Ser:NU0700

TO: See distribution

SUBJECT: Policy for Power Generation for Deployed Force Infrastructure (DFI)

DATE: 25 October 2013

REFERENCE: DPP(2012)0129, letter to the Chairman NATO Senior Joint Engineer Conference (NSJEC), dated 14 February 2012

1. In the Reference the Logistics Committee invited the NATO Senior Joint Engineer Conference (NSJEC) to consider developing a policy for Alternative Operational Energy solutions for base camps.
2. The Military Committee Land Standardization Board Military Engineering (MILENG) Working Group, coordinated and driven by the Military Engineering Centre of Excellence (MILENG COE) has produced such a policy. This policy takes into account the different national and multinational stakeholders and their initiatives, the variability of camps due to location and mission specific operational requirements, current and expected technical solutions. It has been developed in close cooperation with SHAPE, the Science for Peace and Security (SPS) Sustainable Military Compounds Advance Research Workshop, the SPS Smart Energy Team Project and the Energy Security (ENSEC) COE.
3. The draft policy for Power Generation for Deployed Force Infrastructure (Enclosure 1) was endorsed by NSJEC on 09 October 2013 during its annual meeting. It is attached to be forwarded for further consideration by the Logistics Committee.

A handwritten signature in black ink, appearing to read 'Jon B. Lillard'.

Jon B. Lillard
Major General
DACOS C2DS and Chairman NSJEC
HQ SACT

ENCLOSURE:

Military Committee Policy on Power Generation for Deployed Force Infrastructure (DFI)

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DISTRIBUTION:

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Action:

Information:

**Assistant Secretary General for Defence Policy and Planning
Deputy Chairman NATO Military Committee
SHAPE ACOS JENG, andrzej.solarz@shape.nato.int**

Internal –

Action:

Information:

**COS
DCOS CD
SACT CADDEV C2DS, TSC FCL 0150, Cdr. Francesco Rota**

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ENCLOSURE 1 TO
5000/TSC-FCL 0150/TT-9886/Ser:NU0700
DATED: 25 OCT 13

POLICY
ON

POWER GENERATION
FOR DEPLOYED FORCE INFRASTRUCTURE (DFI)

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**POLICY ON POWER GENERATION
FOR DEPLOYED FORCE INFRASTRUCTURE (DFI)**

References:

- A. PO(2010)0169, The Alliance's Strategic Concept, 19 November 2010
- B. Chicago Summit Declaration, 20 May 2012
- C. AC/305-D(2012)0004-AS1, Logistics Committee (LC) Alternative Operational Energy, 6 February 2012
- D. MC 586/1, MC Policy for Allied Forces and Their Use for Operations, 12 June 2012
- E. MC 560/1, MC Policy for Military Engineering, 19 January 2012

INTRODUCTION

Background

1. In November 2010, NATO nations stated that "key environmental and resource constraints, including health risks, climate change, water scarcity and increasing energy needs will further shape the future security environment in areas of concern to NATO and have the potential to significantly affect NATO planning and operations" (reference A). This statement was reiterated during the Chicago Summit in May 2012. In Chicago, the nations also declared that "... we will work towards significantly improving the energy efficiency of our military forces" (reference B).
2. Energy, most often fuel and electricity, is indispensable to the sustainment of military operations. Military forces use large quantities of fossil fuels during operations and a substantial proportion of this consumption is dedicated to electrical power generation for deployed force infrastructure.
3. The demand for energy during military operations has been increasing in part because camps and soldiers have been equipped with additional energy demanding equipment that provides both increased safety and quality of life. The inefficient use of generators in camps, poor insulation of shelters, and a lack of desire or awareness of the requirement to control energy consumption have contributed further to the expanding demand. This has significantly increased the financial and logistical burdens and put soldiers and contractors at risk in convoys, for which the protection effort distracts time and resources from other missions (reference C).
4. Beyond the consideration of the personnel and logistics costs plus the economic benefit of reducing energy consumption, there is a need to consider operational, environmental and strategic issues in enhancing the capability to improve energy efficiency of military forces.

Framework

5. In accordance with MC 586/1, MC Policy for Allied Forces and their Use for Operations, military engineering (MILENG) support includes the development and management of infrastructure (reference D). The MILENG community is working on

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a broad scale "Sustainable Military Compounds" project, a series of Advanced Research Workshops sponsored through the NATO Science for Peace and Security (SPS) Programme. The project aims, inter alia, to develop a conceptual model including more efficient power generation.

6. Other NATO projects have been established to develop new studies on energy efficiency. In particular the Smart Energy Team (SENT) aims to generate cross-cutting knowledge and steer the process of integrating military energy efficiency into Smart Defence.

7. The NATO Energy Security Centre of Excellence (ENSEC COE) also contributes to improving the energy efficiency of NATO military forces. Its mission is to assist nations, Partners and other bodies by supporting the Alliance's capability development process, mission effectiveness, and interoperability by providing comprehensive and timely expertise on aspects of energy security.

AIM

8. To state the policy on power generation for deployed force infrastructure (DFI). It also gives guidance aimed at a reduction in the logistical burden of energy through a demand validation and increased generation efficiency on the scale of DFI.

SCOPE

9. This document describes the principles and guidance to improve energy generation efficiency. It sets a framework for the development of standards. It also addresses the related areas of energy consumption, storage and distribution in order to enhance the overall cost effectiveness.

APPLICABILITY

10. This Policy applies to peace, crisis and conflict and includes NATO exercises and all NATO-led operations and activities. It applies to all NATO and non-NATO nations participating in NATO-led activities. It provides sufficient flexibility for close cooperation with relevant organisations as required.

PRINCIPLES

11. Every camp is different, and the optimum power production solution differs according to the location, climatic conditions, local resources, size, function, Force structure, concept of operations, and the phase of the operation. To achieve energy efficiency, three key principles should be taken into account: modularity, interoperability and sustainability.

a. Modularity.

- (1) Designed and developed as a fully integrated system that may be improved as operations mature and infrastructure requirements change, DFI comprises buildings, facilities and installations required to support military forces when deployed.

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- (2) Within the infrastructure concept, a camp should be treated as a complex system in which all infrastructure construction and operations are interconnected and interrelated.
 - (3) Developed from a series of “blocks”, DFI is the product of adding basic modules to satisfy the capacity requirement. A module can provide complete real life support for a defined size of camp or a specific service for the camp (e.g. ablutions, laundry, kitchen facilities).
 - (4) Modular design of the power generation system will enable capacity to be tailored to the energy requirements of the camp. All energy related equipment and material should be preinstalled as a functional system and prepared for easy set-up.
- b. Interoperability.
- (1) To be interoperable, the differences between European and North American electrical standards should always be considered in order to connect both systems, or in case of handover of all or part of DFI. Electrical devices should be capable of being used with either system and with a host nation’s power grid.
 - (2) A set of aligned power standards should be agreed across the nations to encourage interoperability, and provide the catalyst for “plug and play” capability, development of power generation from renewable energy sources, and improvement of energy storage.
 - (3) Beyond “plug and play” capability, power generation should have an efficient power management system with measurement of the load from the platform services (even if belonging to different owners), and intelligent monitoring and control of power sources to best match energy demands.
 - (4) During the planning phase of an operation or exercise, troop contributing nations should provide an inventory of their equipment for power generation, storage and management, with a view to optimizing energy production efficiency and minimizing energy consumption.
- c. Sustainability.
- (1) Sustainability should be included in all facets of DFI designs. It should be taken into account as early as possible in the planning process and throughout the complete life cycle of DFI.

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- (2) When properly designed and built, a sustainable camp will minimize overall costs during its operation and maintenance. In addition, reducing the logistic footprint will reduce adverse environmental impacts and could lead to better acceptance of the Force, as well as energy savings.
- (3) Sustainability implies the ability to use innovative systems and equipment with low footprint, and local resources if available, leading the way to the stabilization phase and thus the handover of the camp to the host nation (HN).
- (4) The use of renewable and alternative energy (e.g. solar, wind, fuel cells, waste-to-energy technology) is a potential way of reducing liquid fuel consumption. These sources of energy have to take into account a low human and logistic load for their operation and maintenance.

GUIDANCE

12. To successfully implement these principles, it is necessary to adopt a holistic approach, including power generation and management, infrastructure design and management, and command and control, training and awareness.

a. Power Generation and Management.

- (1) Planning and coordination of power requirements, comprising all levels from individual and tactical combat systems up to power generation for a large NATO camp, should be considered as key elements to contribute to increasing the effectiveness of existing energy systems and reducing liquid fuel demand.
- (2) The use of multi-energy as well as multi-size systems, from the early stages of an operation, is recommended to ensure efficient and secure power. However, autonomous power generation and supply must be continuously available for operational functions and critical services in case of failure of a traditional centralized grid.
- (3) In order to ensure scalability, reliability and flexibility of electric power it is preferable to use microgrids, with a mixture of fossil fuel based generators, renewable energy sources, energy storage and HN power, if existing and usable.
- (4) The location and the size of a camp are factors for choosing alternative and renewable energy as main or secondary energy sources. In small, remote or insular camps it is preferable to use renewable energy as the main energy source because the technology and the existing equipment allow a significant reduction of fossil fuel consumption. In larger camps, it is better

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to use it as complement to the main source to meet peak energy demand.

- b. Infrastructure Design and Management.**
 - (1) Real property management responsibilities and “ownership” of portions or all of the camps should be determined as early as possible to enable efficient use of the facilities. The unused or excess infrastructure should be reallocated or demolished.
 - (2) The passive measures such as sealing and insulating of accommodations and using additional protection if needed, should be installed.
 - (3) Appropriate active measures such as low energy consumption equipment (e.g. light-emitting diodes (LEDs) and low energy heating and cooling systems) and occupant sensing switches (e.g. motion sensor lighting) should also be installed. Design and control heating, ventilation and air conditioning (HVAC) systems stringently in order to ensure that each is properly sized and only used when required.

- c. Command and Control, Training and Awareness.**
 - (1) Operational commanders are responsible for the use of resources under their command, including energy. The senior military engineer (in accordance with MC 560/1 (reference E), the JFENGR at the operational level and the Chief Engineer at the tactical level) advises the commander on operational energy concerns such as energy conservation programs, awareness plans and training objectives.
 - (2) The implementation of an effective energy awareness campaign plays a key role in the success of any energy conservation program. By influencing individual actions and behaviours it is possible to reduce overall energy consumption. There are two elements to awareness; the first is to provide training to inform all personnel on the best practices in order to minimize energy consumption, and the second is to reinforce that training with feedback that highlights successes or potential areas for improvement. In order to validate the impact of energy awareness campaigns and conservation programs, senior military engineers should establish performance measurement criteria to both guide decision making and provide focus for further conservation efforts. Most importantly, the support of the chain of command, beginning with the commander, is essential to instill a true "energy conservation ethos" down to the lowest level.

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SYNERGY

13. In accordance with the Connected Forces Initiative¹ (CFI), NATO and Partner nations, under the auspices of NATO Senior Joint Engineer Conference (NSJEC) and within the framework of the MILENG Working Group as the focal point, are encouraged to continue to engage academia and industry to identify additional potential energy saving solutions suitable for military use, taking into account interoperability and standardization. They should exchange information, lessons learned and outcomes, using enablers and stakeholders such as the ENSEC COE and MILENG COE, in order to improve standardized doctrine and equipment on power generation.

IMPLEMENTATION

14. NATO Commands at all levels are to implement this Policy into their concepts, doctrine and procedures in agreement with nations. NATO and Partner nations are strongly encouraged to adapt their own national policy, concepts, doctrine and procedures in order to implement this Policy as fully as possible.

Annex:

A. Related Documents

¹ The fundamental elements of CFI are expanded education and training, increased exercises and better use of technology.

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ANNEX A

RELATED DOCUMENTS

- A. MC 469/1, NATO Military Principles and Policies for Environmental Protection, 13 October 2011
- B. MC 319/3, NATO Principles and Policies for Logistics, Final Draft Revision 4, 28 September 2012
- C. STANAG 2238 (AJP-3.12(B)), Allied Joint Doctrine for Military Engineering, Ratification Draft February 2013
- D. STANAG 2394 (ATP-3.12.1), Allied Tactical Doctrine for Military Engineering, Study Draft 2, April 2013
- E. STANAG 4133, Electrical Power Supplies: Standard Types and Rotating Generating Sets (AC-DC), Study Draft April 2013
- F. AEP-28, Allied Engineering Publication Electrical Power Supply in the Field: Technical Aspects for Interoperability, Study Draft December 2012
- G. STANAG 7141 (AJEPP-4), Joint NATO Doctrine for Environmental Protection During NATO-led Military Activities, 26 February 2008
- H. STANAG 2581 (AJEPP-1), Environmental Protection Standards and Norms for Military Compounds in NATO Operations, 7 September 2011
- I. STANAG 2582 (AJEPP-2), Best Environmental Protection Practices for Military Compounds in NATO Operations, 17 August 2011