NATO OTAN

NATO STANDARDIZATION AGENCY
AGENCE OTAN DE NORMALISATION

NSA

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See Distribution List: EAPC (NPC)

STANAG 2115 DPP (EDITION 6) – FUEL CONSUMPTION UNIT

References:
NSA/1083(2008)-DPP/2115, dated 20 October 2008

1. The enclosed NATO Standardization Agreement, which has been ratified by nations as reflected in the NATO Standardization and Documentation Database (NSDD), is promulgated herewith.

2. The reference listed above is to be destroyed in accordance with local document destruction procedures.

ACTION BY NATIONAL STAFFS

3. The NATO Petroleum Committee (AC/112) considers this an editorial edition of the STANAG, previous ratifying references and implementation details are deemed to be valid.

Juan A. MORENO
Vice Admiral, ESP(N)
Director, NATO Standardization Agency

Enclosure:
STANAG 2115 (Edition 6)

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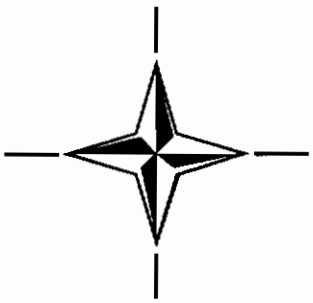
STANAG 2115
(Edition 6)

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



NATO STANDARDIZATION AGENCY
(NSA)

STANDARDIZATION AGREEMENT
(STANAG)

SUBJECT: FUEL CONSUMPTION UNIT

Promulgated on 3 March 2010

Juan A. MORENO
Vice Admiral, ESP(N)
Director, NATO Standardization Agency

RECORD OF AMENDMENTS

No.	Reference/date of Amendment	Date Entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. his NATO Standardization Agreement (STANAG) is promulgated by the Director NATO Standardization Agency under the authority vested in him by the NATO Standardization Organisation Charter.

2. No departure may be made from the agreement without informing the tasking authority in the form of a reservation. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.

3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

4.Ratification, implementation and reservation details are available on request or through the NSA websites (internet http://nsa.nato.int; NATO Secure WAN http://nsa.hq.nato.int).

FEEDBACK

5. Any comments concerning this publication should be directed to NATO/NSA – Bvd Leopold III - 1110 Brussels - BEL.

STANAG 2115
(Edition 6)

NATO STANDARDIZATION AGREEMENT (STANAG)

FUEL CONSUMPTION UNIT

Related Documents	STANAG 1135	Interchangeability of Fuels, Lubricants and Associated Products used by the Armed Forces of the North Atlantic Treaty Nations,
	STANAG 3151	Codification – Uniform System of Item Identification
	STANAG 4362	Fuel for Future Ground Equipment Using Compression Ignition or Turbine Engines,
	MC 55/4	NATO Logistic Readiness and Sustainability Policy, January 2003
		Bi-SC Stockpile Planning Guidance

AIM

1. The aim of this agreement is to standardize, for both Readiness and Sustainment Stockpile Planning (including the use of the NATO Forces when engaged in operations), the basis of calculation to be used in:

   a. Determining a common methodology for fuel consumption for units or formations.

   b. Expressing fuel stock levels and requirements.

   c. Determining storage and transportation requirements.

AGREEMENT

2. Participating nations agree to apply the basic “Fuel Consumption Unit” (FCU) described in Part A below in:

   a. Determining fuel requirements for a standard performance to include:

      (1) Land operating vehicles.

      (2) Stationary and mobile fuel consuming engines, machine and equipment when operating on land.

      (3) Engineer boats, assault boats and other boats of Joint Forces.

   b. Reporting supply levels and requirements.

3. Participating nations agree to apply the modified Air and Maritime FCU described in Parts B and C below in:

a. Determining fuel requirements for a standard performance to include:

(1) Fixed- wing and rotary-wing aircraft, drones and UAVs.

(2) Vessels of Naval Forces including stationary and mobile fuel consuming engines, machine and equipment when operating aboard ships.

b. Reporting supply levels and requirements.

DEFINITIONS

4. The following definitions are used for the purpose of this agreement:

a. Fuel Consumption Unit (FCU) represents the quantity of fuel required by a unit/formation for operations under assumed operating conditions for a standard performance. Quantities of fuel for each FCU are to be expressed in the metric system in litres (l), or in cubic metres (m3) for aviation turbine and marine fuels. Therefore, the FCU is a statement of capability based of a level of effort.

b. Day of Supply (DOS) represents the total amount of supplies required for an average day based on Standing Group NATO rates and/or on national rates as appropriate.

DETERMINATION OF FCU

5. Participating nations shall determine FCUs for the following categories of fuels specified in STANAG 1135 (Annex C):

a. Aviation turbine fuel.

b. Aviation gasoline.

c. Diesel fuels including marine diesel.

d. Automotive gasoline.

e. Kerosene used for heating and lighting.

6. No FCU is to be determined for lubricants. Stockpile/storage/transportation requirements for lubricants should be calculated using the same level-of effort methodology.

CALCULATION FOR STOCKPILE PLANNING

7. **Readiness Stockpile Planning.** For Readiness Stockpile Planning calculation purposes, one FCU will be considered to constitute one standard day of supply (SDOS) for each of the number of days specified in MC 55/4.

8. **Sustainment Stockpile Planning.** For Sustainment Stockpile Planning calculation purposes as envisioned in MC 55/4, one day of supply (DOS) will equate to one FCU multiplied by the relevant modification factors for the specific planning situation.

CAPABILITY PROVIDED BY ONE FCU

9. The following capabilities are defined by one FCU:

PART A – LAND

(1) Tracked and Wheeled Vehicles. One hundred kms with normal crew and operating loads (including trailers/towed equipment if normally towed) on metalled, level, dry roads at 50 kph.

(2) Stationary and Mobile Fuel Consuming Engines, Machine and Equipment. Twelve hours at normal operating rate or load.

(3) Engineer Boats, Assault Boats and Other Boats of Joint Forces. Normal operating time of twelve hours at nationally rated speeds and loads.

(4) Locomotives. Normal operating time of twelve hours.

(5) Cooking, Heating and Lighting Equipment. Normal operating time of twenty-four hours.

PART B – AIR

(1) Fixed-wing Combat Aircraft. One sortie of two flying hours at normal national operating speed and profiles.

(2) Fixed-wing Transport and Tanker Aircraft. One sortie of four flying hours at medium operational height and cruising speed.

(3) Other Fixed-wing Aircraft. One sortie of two flying hours at medium operational height and cruising speed

(4) Rotary-wing Aircraft. Five flying hours at normal national operating speed and profiles.

(5) Drones and UAVs. Accumulated flying time of two hours in standard configuration.

PART C – MARITIME

(1) Combatant and Support Vessels eg CVS, DD, FF, AO and MM/PP. Twenty-four hours cruising at fifteen knots, or at normal cruising speed if lower.

MODIFICATION FACTORS

10. For operational sustainment planning, the following qualitative and/or quantitative modification factors should be taken into account when computing the fuel requirements:

LAND				
		Condition	Factor	Comments
Qualitative factors				
	Combat Intensity			
	(1)	Steady State	1.0	
	(2)	Urban operations	1.5	
	(3)	Pre-operational training	1.8	
	(4)	Other operations	2.1	
	(5)	High intensity operations	2.4	
	Terrain:			
	(1)	Flat	1.0	
	(2)	Hilly	1.2	
	(3)	Cross Country	1.5	
	(4)	Mountainous	1.5	
	Climate:			
	(1)	Hot	0.9	
	(2)	Temperate	1.0	
	(3)	Cold	1.3	
	(4)	Extreme Cold	1.5	

LAND				
		Condition	Factor	Comments
Qualitative factors				
	Unit Role:			
	(1)	1st line	1.0	)could be used as
	(2)	2nd line	TBD	) alternative to
	(3)	3rd line	TBD	) distance factors
Quantitative Factors				
	(1)	Distance travelled	(as appropriate, factored to 100 km,	eg standard daily travel of 200 km would be 2.0
	(2)	Single fuel concept	1.1	
AIR				
Quantitative factors				
	(1)	Sortie rate / day		For fixed-wing aircraft
	(2)	Sortie duration (hr)	Factored to standard sortie duration	
MARITIME				
Qualitative factors				
	Speed			
	(1)	Auxiliary	0.6	Ship in harbour under own power/ Maritime inderdiction ops (MIOPS).
	(2)	Normal	1.0	Cruising
	(3)	Exceptional	3.0	Intensive operations/exercise

The relevant modification factors are modified together to arrive at the DOS as illustrated in the following examples:

Qualitative. High intensity operations in hilly condition in hot climatic conditions would attract (1 FCU x 2.4 x 1.2 x 0.9 = 2.59 FCU).

Quantitative. Fixed-wing combat aircraft flying 2 sorties each of 3.2 hrs duration per day would attract (1 FCU x 2 x (3.2/2) = 3.2 FCU)

Combined Qualitative and Quantitative. Pre-operational training in hilly terrain, in temperate climate travelling 80 km per day using single fuel concept would attract (1 FCU x 1.8 x 1.2 x 0.8 x 1.1 = 1.9 FCU)

11. Wastage For operational sustainment planning the combined modification factors take into account wastage.

IMPLEMENTATION OF THE AGREEMENT

12. This STANAG is implemented when a nation has issued the necessary orders/instructions to the forces concerned putting into effect the procedures detailed in this agreement.