

CHAPTER 8

COMMUNICATION INSTRUCTIONS FOR U.S. MERCHANT SHIPS

Chapter 8 sets forth instructions and procedures for U.S. merchant vessels to establish communications in order to receive and send information to/from the Homeland Defense (HLD) organization, Naval Cooperation and Guidance for Shipping (NCAGS), during normal operations or times of crisis.

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COMMUNICATION INSTRUCTIONS FOR U.S. MERCHANT SHIPS

PART I U.S. NAVAL COOPERATION AND GUIDANCE FOR SHIPPING (NCAGS)

800A. General

The purpose of this section is to provide guidance to ship owners, operators, Masters, and officers on the arrangements for Naval Cooperation and Guidance for Shipping (NCAGS) in order to enhance the safety of merchant ships and to support military operations. It provides information on the provision of NCAGS support.

In periods of crisis, conflict, national emergency or war, naval authorities may direct the movement of merchant ships (including routing and diversion) so that they may be better protected from hostilities and not interfere with possible active Naval and/or Joint Military Operations. The NCAGS organization is the principal U.S. resource to carry out this function. The purpose of NCAGS is to ensure the efficient management and safe passage of merchant ships.

This mission primarily involves:

- the establishment of an organization and framework for communicating directions, advisories, concerns, and/or information among operational forces, merchant shipping, and maritime organizations;
- the deconfliction of merchant vessel sailings/operations, for safety to preclude interference with naval activities;
- and making recommendations to the theater/ operational commander on the extent and type of protection that may be provided to merchant shipping.

800B. History of NCAGS

NCAGS was formerly known as NCAPS (Naval Coordination and Protection of Shipping). NCAPS was originally established to meet a Cold War-era national need to protect merchant shipping against a global open ocean threat. NCAPS policy included escorting and routing of large convoys of merchant shipping.

The threat to merchant shipping has changed and so has the Naval Control of Shipping (NCS) mission. The primary threat to U.S. merchant vessels is no longer considered to be traditional naval vessels under the flag of a known enemy; instead, the threat is terrorism. The NCAGS mission is to provide U.S. military commanders the information necessary to provide Maritime Domain Awareness (MDA). The goal of MDA is to assist in Homeland Defense (HLD) by maintaining as much real-time information as possible regarding merchant shipping, such as positions, destinations, cargo, etc. As a result, the NCAGS organization can provide U.S. and

allied merchant vessels the information needed to help prevent terrorist attacks at sea or in port.

800C. NCAGS Organization

NCAGS doctrine has evolved with the changing threat posed both on merchant shipping and by merchant shipping in the context of regional operations and maritime HLD. The NCAGS organization addresses both the traditional protection and control of shipping in a region and the emerging requirement of maritime HLD, where merchant shipping may be either the protagonist, or target, requiring the establishment of communications to increase maritime situational awareness of merchant shipping. NCAGS doctrine applies to maritime HLD, contingency support, and general economic shipping.

Types of contingency support shipping include naval vessels of the Military Sealift Command (MSC), shipping operated or chartered by the U.S. Government to support naval operations or to meet U.S. policy objectives, crisis response shipping, and relief shipping chartered by government agencies.

Types of economic shipping include vessels engaged in normal commercial trade worldwide, regardless of flag or ownership, or such other shipping that is not under the control or direction of the U.S. Government.

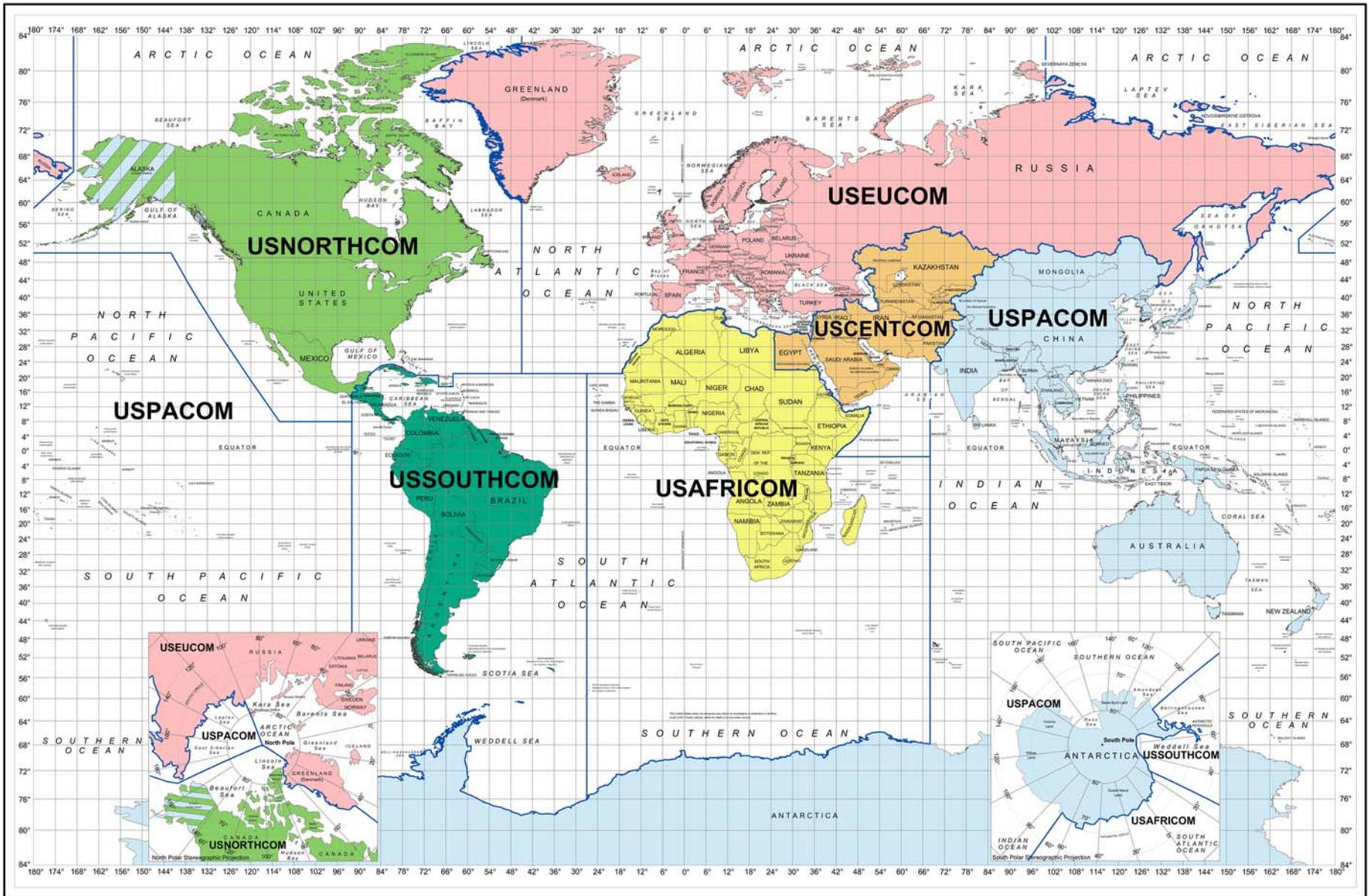
Specific to maritime HLD operations in the United States Northern Command (USNORTHCOM) Area of Responsibility (AOR), a new organization was developed in an effort to execute the required mission to improve maritime HLD and to support the USCG as the lead federal agency for maritime Homeland Security (HLS). As an element of the Joint Force Maritime Component Commander (JFMCC), the NCAGS organization provides direct support to USNORTHCOM's mission of conducting operations to deter, prevent, and defeat maritime threats and aggression. NCAGS works jointly with the United States Coast Guard (USCG). The NCAGS organization consists of Shipping Coordination Centers (SCCs) geographically positioned to assist in improving merchant shipping coordination and providing positional information of merchant vessels operating in the USNORTHCOM AOR. The SCCs are the first step in creating a global merchant vessel tracking capability for the maritime domain.

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800D. Questions and Comments

Ship's Officers, ship owners, and operators are encouraged to submit questions and comments on procedures outlined in this chapter to:

U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK VA 23551-2487



THE WORLD WITH U.S. COMMANDERS' AREAS OF RESPONSIBILITY

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PART II COORDINATION WITH NCAGS

800E. General

The primary organization responsible for executing the NCAGS mission is the Shipping Coordination Center (SCC). A SCC bridges the gap between military leaders responsible for HLD and U.S. merchant shipping. NCAGS support provided by the SCC includes military cooperation, guidance, advice, assistance, and supervision to merchant shipping to enhance the safety of U.S. and allied merchant ships and to support military operations by maintaining awareness of merchant shipping positions around the U.S. The purpose of NCAGS is to make use of cooperation between military and civil maritime authorities and agencies and the commercial shipping industry in order to facilitate an uninterrupted flow of maritime commerce in periods of peace and conflict and simultaneously minimize disruption to military operations.

The cooperation and frequent exchange of information achieve this goal. An accurate assessment of the merchant shipping picture is critical to the accomplishment of this goal. Masters will be asked to provide basic information concerning their ship, cargo, and voyage details. In times of increased tension or conflict, additional information may be requested. The response of Masters to information requests is one of the most important aspects of NCAGS. The commercial sensitivity of the information supplied by the merchant shipping community will be respected and protected.

The NCAGS organization will in turn ensure that appropriate military authorities are advised of these details for monitoring during the voyage. If deemed necessary, they will provide the merchant Master with up-to-date information concerning the situation and specific information on the voyage. This information can range from basic situation briefs to the provision of routes, lead through, or escort. Safe passage responsibility remains with the Master.

The principal benefits of NCAGS to merchant shipping include:

- Improved safety and security.
- Minimized disruptions to passages through areas where military operations are being conducted.
- Quicker reaction to terrorism.
- A better understanding of military constraints.
- Minimized disruption to commercial schedules.

The principal benefits of NCAGS to the military commander include:

- A more comprehensive picture of merchant activity and positions of merchant ships.
- Deconfliction of merchant ships in military operations.
- Enhanced safety and security of merchant ships.
- Improved effectiveness of military operations.
- A better understanding of commercial constraints.

800F. Elements of the NCAGS

The NCAGS is flexible in order to meet the needs of the military commander and merchant shipping. It may comprise some or all of the following elements tailored to suit the situation depending on the level of NCAGS support required.

- Shipping Coordination Center (SCC): The SCC is a permanent organization, tasked with establishing and maintaining links with the military, merchant shipping, HLD and HLS agencies, such as the USCG. The SCC will:
 - Provide MDA by maintaining a merchant shipping plot of the assigned AOR.
 - Generate Notice to Mariners (NOTMARs) as necessary regarding acts of terrorism or military operations.
 - Advise civil maritime authorities, via Maritime Administration (MARAD), of general shipping risks in the area.
 - Establish Shipping Risk Areas (SRAs) and recommend routing of shipping.
- Shipping Coordination Team (SCT): The SCT is an expeditionary team that can be deployed to a specific region to gather information on local merchant shipping and naval operations and will provide the means to brief merchant shipping on risks, routing, and organization for protection. The SCT will, depending on the level of an operation, encompass coordination and guidance to local military commanders and merchant Masters. The location of SCTs can be ashore or afloat. The SCT liaises with local and regional authorities including port authorities, shipping agents, and local shipping companies and reports ship movements to local military commanders to help deconflict military operations with merchant shipping.
- NCAGS Liaison Officer (LNO): An officer deployed aboard a merchant ship to provide liaison between the merchant ship Master and military authorities. The LNO is the naval advisor to the merchant Master. His position on board does not affect the Master's responsibilities for the safe navigation and safe handling of the ship. The LNO makes military knowledge available to the Master to allow the Master to understand the naval and military requirements that are applicable.
- Shipping Risk Area (SRA): When necessary, a SRA may be recommended by a SCC or SCT. A SRA is a geographically defined portion of the NCAGS area where an elevated risk to merchant shipping exists. Risks can include potentially hostile acts, navigational restrictions that require an elevated closer management of shipping traffic, or naval forces operations that may conflict with routine safe passage. More than one SRA can be established within an NCAGS area. SRAs are established by the local military commander.

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PART III COMMUNICATIONS WITH NCAGS

800G. General

The role of NCAGS in keeping the seas safe and providing the essential framework needed to allow commercial and military shipping to operate together in a crisis is dependent on effective communications with merchant shipping at sea or in port. The SCC or SCT will exchange data at the unclassified level with merchant shipping authorities and with elements of the NCAGS organization. This part provides guidance to Masters who may need to communicate with military forces. Communications with merchant ships by the military are accomplished via the Global Maritime Distress and Safety System (GMDSS) and other commercial means. Under normal circumstances, ships working with NCAGS will maintain their normal peacetime communications. However, if the situation so dictates, they may be required to maintain additional communications methods.

800H. Methods of Communication

GMDSS: Every effort is made by the NCAGS organization to provide communications for merchant vessels to either the SCC or SCT so that ships can communicate easily and regularly with them using Inmarsat-C. Generally telex, fax, email, and voice, when available, are used as the primary means for the NCAGS organization to contact ships either through owners, directly to the ships if this has been made available, or via commercial organizations who specialize in passing messages.

Navigational Warnings (NAVWARNs)/Notice to Mariners (NOTMARs): The military authorities will pass safety information for the NCAGS AOR, promulgated by broadcast methods, via NAVWARNs, NOTMARs, and MARAD Advisories. These warnings will describe possible military operations in an AOR. Notices will include toll free telephone numbers a merchant Master or agent can call to obtain real-time information regarding an ongoing crisis or military operation.

Military Points of Contact: A SCC, SCT, or NCAGS LNO can provide merchant shipping with their main means of communications in an elevated risk situation via GMDSS, NAVWARNs/NOTMARs, or embarked LNO.

Communication Reporting Gate (CRG): In an AOR, there is a good possibility that your ship will be called, or challenged, by naval vessels or military aircraft on the VHF calling frequency. To allow merchant ships to contact naval vessels in the AOR, information will be distributed directly to the Master via LNO, naval vessels in the local area, or local advisory notices by various means including, but not limited to, NOTMARs, e-mail, or websites. However, naval units can normally be contacted through standard calling VHF frequencies.

CRG is established to provide a position/line for merchant ships to call NCAGS in order to establish initial

contact or to update previous information. A CRG should be positioned in such a way that a minimum notice period of 36 hours is available to merchant ships to contact their owners/operators for onward passage instructions before reaching the AOR. The CRG will normally be represented as lines of latitude or longitude that encompasses the area concerned.

Ships will be notified of the CRG details for the AOR and the reporting requirements will be promulgated to merchant ships through a variety of means, such as by the SCC, SCT advisory notices, or NAVWARNs. Instructions will normally contain details of the information required, the occasions of reporting, and to whom the report is to be sent. Ships will be asked to forward a Format Alfa before arriving at the CRG.

800I. Forms and Message Formats

(Ref: ATP-2, Vol. II)

Format Alfa: Format Alfa is the principal means by which merchant ship data is collected for use by the NCAGS. The Format Alfa will be requested to be forwarded at least 24 hours prior to entering the area of operations and then, if possible, every 6 hours until exiting the area of operations. The form is divided into four sections:

- Section A covers basic details of the vessel.
- Section B covers details of the current voyage.
- Section C covers details of the ship's operator.
- Section D covers cargo data.

NOTE: Date and Time should be entered either by the date followed by a four digit time (18.Oct 97 21.00 UTC) or a Date-time Group (DTG). The military method of expressing date and time is contained within the DTG and is written in the following manner:

DDHHMMZ MON YY

therefore, the DTG 182100Z JUL 98 describes a time of 21:00 (GMT/UTC) on the 18 July 1998. Military units routinely describe GMT/UTC as time zone "Zulu" abbreviated to "Z."

- Section A - Ship Data:

- (1) Ship's name.
- (2) International call sign.
- (3) Type of vessel.
- (4) Flag of registry.
- (5) IMO number.
- (6) Port of registry.
- (7) Overall length.
- (8) Vessel's width.
- (9) Maximum draft for present voyage.
- (10) Vessel's gross tonnage.
- (11) Speed:
 - (a) Service speed.
 - (b) Maximum speed.

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(c) Minimum speed.

- (12) Significant appearance of vessel for optical recognition.
- (13) Inmarsat/DSC number.
- (14) Name of communication station being copied.
- (15) State whether pocket-sized automatic crypto equipment (PACE) and keying material is held.
- (16) Fax number.
- (17) Email address or telex number.
- (18) Other communication means.

– Section B - Voyage Data:

- (19) Intended movement - description of passage.
- (20) Last port/country of call including actual date and time of departure from last port.
- (21) Next port of call, including ETA at next port of call.
- (22) Current position.
- (23) Date/time and position entering the region.
 - (a - x) Waypoints of intended track through AOR (date/time - latitudes/longitudes).
- (24) Position and date/time of departing the region.

– Section C - Operator Data:

- (25) Name of ship owner/operator including address of ship owner, name of charterer (if any), and address of operator/charterer.
- (26) Flag of ship operator.
- (27) Email address of the above.
- (28) Telephone number of above.
- (29) Fax number of above.

– Section D - Cargo Data:

- (30) Quantity and nature of main/relevant cargo.
- (31) Shippers of main/relevant cargo (name and address).
- (32) Origin of main/relevant cargo.
- (33) Consignee of main/relevant cargo.
- (34) Final destination of main/relevant cargo.
- (35) Special queries appropriate to current operation such as “State if any cargo/person is carried being subject to UN sanctions, by YES or NO (if the answer to the query is YES, then describe on a separate sheet).”

Ship Data Cards: Ship Data Cards are amplifications of the information provided by the merchant ship on the Format Alfa that is used to facilitate cooperation between merchant ships and military assets. Masters will be asked to supply only information that is not available from other open sources, such as agents and the Internet.

Sailing Instructions (SI): SI are issued to all ships transiting a SRA and any other ships requiring specific guidance. The issue of a SI indicates that the Master has accepted the routing guidance contained within the SI. NCAGS will monitor the ship’s passage and divert the ship if the threat or risk changes and a diversion message will be sent to the Master.

Diversion Order: A message from NCAGS ordering a diversion from the existing route for any reason. The first words of the text will be the identifier “DIVERSION ORDER” followed by:

- (1) The reason for diversion.
- (2) The position or time at which the diversion is to take place.
- (3) New positions through which ships are to pass. Each position is to be preceded by its two letter designator.
- (4) The immediate destination and amended ETA.

Example:
DIVERSION ORDER

- (1) Acts of terrorism in your vicinity.
- (2) Divert at position AB.
- (3) Pass through new positions BL 4245N04800W, BM 4230N05500W, then to original position AE and original track.
- (4) Amended ETA Baltimore 160800Z Jan.

Passage Amendment: This message is to be sent by a ship to report passage amendments involving changes in destination or differences of greater than 6 hours variance from the original passage plan intentions reported by Format Alfa. The message will be addressed to the original addressee of the Format Alfa. The first words of the text will be the identifier “FORMAT ALFA PASSAGE AMENDMENT” followed by:

- (1) The international call sign, IMO number, and name of the ship.
- (2) Position at
- (3) Great circle or rhumb line track and speed.
- (4) Name of next port of call.
- (5) ETA at next port of call.

Example:
FORMAT ALFA PASSAGE AMENDMENT
(1) WGLW, 9076236, SS YOUNG AMERICA.
(2) 4315N 03515W at 181500Z Aug.
(3) Rhumb line/19.
(4) Baltimore.
(5) 221200Z Aug.

**PART IV CONTAMINATION PREDICTION SYSTEM FOR MERCHANT SHIPS AT SEA
AND THE MERWARN SYSTEM**

800J. Significance of NBC Warnings

Radioactive fallout from nuclear explosions and chemical and biological contamination (hereafter collectively referred to as contamination) on sea and land targets, particularly the latter, may affect large areas of adjacent waters. The areas affected will depend upon the prevailing wind conditions, and any ship close to or approaching these areas will be in grave danger. It is therefore essential that shipping should be warned of the fallout hazards and contamination in order that:

- Passive defense measures, such as activating washdown systems, may be taken.
- Course may be altered, if necessary, to avoid the dangerous zones.

800K. The MERWARN System, Warnings to Merchant Ships at Sea

A simplified contamination warning system has been established throughout NATO for broadcasting, via MERCOMMS and coastal radio stations, warnings of contamination dangerous to merchant shipping. This system calls for the origination, by NATO naval authorities, of five types of messages:

- MERWARN NBC Effective Downwind Message (MERWARN NBC EDM).
- MERWARN NBC 3 NUC.
- MERWARN NBC Chemical Downwind Message (MERWARN NBC CDM).
- MERWARN NBC 3 CHEM.
- MERWARN DIVERSION ORDER.

In some cases it may be better to provide warning of contamination by means of general plain language messages rather than by these formats.

800L. MERWARN Originating and Diversion Authorities

MERWARN Originating and Diversion authorities will be designated by national or NATO commanders before commencement of operations.

800M. Precedence of NBC Messages

All MERWARN NBC messages should be given FLASH (Z) precedence to ensure rapid handling on any military circuit between the originating authority and the MERCOMMS and/or coastal radio stations. This precedence should not be used where the rules for the use of the international safety signal (SECURITAY for voice circuits) apply.

800N. Method of Promulgation

All MERWARN NBC EDM, MERWARN NBC CDM, MERWARN NBC 3 CHEM and NBC 3 NUC messages will be transmitted in plain language, using GMT, preceded by the international safety signal, from the appropriate MERCOMMS station and from all the coastal radio stations of the area concerned. Masters need not concern themselves with the identity of the MERWARN originators, but only with the sea areas covered by each message.

800O. Relay Responsibilities

- Originating authorities are responsible for relaying to:
- The appropriate Coast Earth Station (Inmarsat CES), Coast Radio Station (CRS) under their control, and/or other CRS in their geographic area.
 - Their own national authorities (for transmission to merchant ships not yet copying MERCOMMS).
 - Adjacent MERWARN originators and shipping diverting authorities within the geographical area affected by each MERWARN NBC 3 NUC message.

NOTE: Adjacent MERWARN originators are responsible for relaying to CES/CRS under their control as necessary.

800P. Danger Zones

All shipping in waters out to 200 nautical miles from any coast at the outset of war must be regarded as being in an area of possible fallout danger from nuclear attacks on shore.

800Q. MERWARN NBC EDM

MERWARN NBC EDM is a prediction, for a specified sea area and time interval, of the fallout which will result from a 1 megaton (MT) nuclear surface explosion. It will give the Master of a ship, observing a nuclear explosion, an immediate indication of the area likely to be affected by fallout.

MERWARN NBC EDM will be issued at 12 hour intervals from the time of activation of the MERCOMMS system, and will be valid 12 hours ahead from the date and time given in the first line of the message (line A). In the event of changing meteorological conditions it may be necessary for the originating authorities to issue MERWARN NBC EDM more frequently. The original MERWARN NBC EDM will automatically be overruled by the latest MERWARN EDM issued.

The following standard format will be used:

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- A. Message identifier (MERWARN NBC EDM) and date-time group (GMT) from which valid for 12 hours ahead.
- B. Specified sea area for which valid.
- C. Effective downwind direction (in degrees, three digits) and effective downwind speed (in knots, three digits).
- D. Downwind distance of Zone 1 (in nautical miles, three digits).
- E. Additional information.

Example:

- A. MERWARN NBC EDM 180600ZSEP1999
- B. BALTIC SEA WEST OF 15°00'E
- C. 045-020
- D. 078
- E. NIL

NOTE: Sets B, C, and D may be repeated for different sea areas should this be considered necessary.

800R. MERWARN NBC 3 NUC, Standard Format

MERWARN NBC 3 NUC will be issued after a nuclear attack producing fallout, and gives fallout data for a specific explosion or series of explosions, which will be identified in the message.

MERWARN NBC 3 NUC messages are issued as soon as possible after the attack, and at 6 hour intervals (to the nearest hour) thereafter, for as long as fallout danger exists. They contain information which enables the Master of a ship to plot the danger area.

The standard format of MERWARN NBC 3 NUC contains the sets ALFA, DELTA, FOXTROT, and PAPAB of the military NBC 3 NUC message.

The MERWARN NBC 3 NUC has the following structure:

MERWARN NBC 3 NUC (Message identifier)

- ALFA: Strike Serial Number (as defined by the naval authority).
- DELTA: Date-time Group of detonation (GMT).
- FOXTROT: Location of attack (latitude and longitude, or geographical place name) and qualifier (two digits as follows: AA=Actual Location, EE=Estimated Location).
- PAPAB: Effective wind speed (three digits and unit of measurement), downwind distance of Zone 1 (three digits and unit of measurement), cloud radius (two digits and unit of measurement), left and right radial line of the predicted fallout hazard area (three digits and unit of measurement each).

Example:

MERWARN NBC 3 NUC

ALFA/UK/NBCC/02-001/N//
DELTA/021405ZSEP1999//
FOXTROT/451230N014312E/AA//
PAPAB/012KTS/028NM/02NM/272DGT/312DGT//

800S. MERWARN NBC 3 NUC, Plain Language Format

The MERWARN NBC 3 NUC standard format may not be suitable after a multiple nuclear attack which produces fallout from several bursts in a large or complex target area. In such cases warnings will be plain language statements of a more general nature, indicating area affected and expected movement of the fallout.

Example 1:

MERWARN NBC 3 NUC

ALFA/UK/02-001/N//
DELTA/021405ZSEP1999//
Fallout extends from Glasgow area to eastern Ireland at 021405Z and is spreading westwards with 12 Knots. Irish Sea is likely to be affected within an area of 60 nautical miles of the British coast.

Example 2:

MERWARN NBC 3 NUC

ALFA/IT/15-001/N//
DELTA/150630ZFEB1999//
Fallout is estimated to be occurring at 150830Z over Adriatic Sea east of the coast line Bari/Brindisi up to a distance of 30 nautical miles. Fallout is moving south-eastwards with 016 Knots, getting weaker. It is not expected to be dangerous after 151000Z.

800T. MERWARN NBC CDM

The MERWARN NBC CDM message contains information needed for CHEM/BIO hazard prediction by the master of a merchant ship. The MERWARN NBC CDM will be issued as required via the MERCOMMS and will be valid as specified. In the event of changes in the meteorological conditions, the MERWARN NBC CDM will be updated as required.

The following standard format will be used:

- ALFA: Message identifier (MERWARN NBC CDM), date-time group (GMT) from which valid 6 hours ahead.
- BRAVO: Specified sea area for which valid.
- CHARLIE: Representative downwind direction (degrees, 3 digits) and representative downwind speed (knots, 3 digits).
- DELTA: Maximum downwind hazard distance (nautical miles, 3 digits).

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ECHO: Additional information.

Example:

ALFA MERWARN NBC CDM 180600ZSEP1999//
BRAVO BALTIC SEA WEST OF 15°00'E//
CHARLIE 045/020//
DELTA 010//
ECHO NIL//

800U. MERWARN NBC 3 CHEM

This message is issued to pass immediate warning of a predicted chemical contamination and hazard area. MERWARN NBC 3 CHEM reports are issued as soon as possible after each attack. They contain sufficient information to enable the master of a ship to plot the downwind hazard area.

The following standard format will be used for MERWARN NBC 3 CHEM:

MERWARN NBC 3 CHEM (Message identifier)

ALFA: Strike Serial Number (as defined by the naval authority).
DELTA: Date-time group (Z) of start and end of attack.
FOXTROT: Location of event.
GOLF: Delivery Means.
INDIA: Release Information.
PAPAA: Predicted attack and hazard area.

NOTE: If representative downwind speed is 5 knots or less, or variable, this letter item will consist of three (3) digits instead of coordinates, representing the radius of a circle in nautical miles centered on the location of the attack contained in set FOXTROT.

YANKEE: The representative downwind direction and speed.
ZULU: Information on actual weather conditions.
GENTEXT: Remarks.

NOTE: Some of the letter items above may not be completed in the report that is received, but there will be sufficient information for a Downwind Hazard plot to be carried out.

The MERWARN NBC 3 CHEM standard format may not be suitable after a multiple chemical attack, which produces a hazard from several attacks or depositions in a large or complex target area. In such cases warnings will be plain language statements of a more general nature,

indicating areas affected and expected movement of the hazard.

Example 1:

MERWARN NBC 3 CHEM
ALFA/DA/NBCC-4/003/C//
DELTA/020300ZSEP1999//
GENTEXT/PERSISTENT NERVE AGENT VAPOR HAZARD EXISTS FROM NORFOLK TO HATTERAS AT 020300Z SEP 1999 AND IS SPREADING SOUTH-EASTWARDS AT 017 KNOTS. SEA AREA OUT TO 100 NAUTICAL MILES FROM COAST LIKELY TO BE AFFECTED BY 020600ZSEP1999//

Example 2:

MERWARN NBC 3 CHEM
ALFA/DA/NBCC-3/003/C//
DELTA/020300ZSEP1999//
GENTEXT/PERSISTENT NERVE AGENT VAPOR HAZARD AT 020600Z SEP 99 IS ESTIMATED TO BE OCCURRING OVER MOST OF THE SEA AREAS OUT TO 40 MILES EAST OF THE COAST LINE FROM NORFOLK TO HATTERAS. HAZARD IS EXPECTED TO HAVE DISPERSED BY 021000Z SEP1999//

800V. MERWARN DIVERSION ORDER

In addition to the origination of MERWARN NBC EDM and MERWARN NBC 3 NUC messages, naval authorities may, if circumstances dictate, broadcast general diversion orders, based upon the fallout threat, whereby merchant ships proceeding independently will be passed evasive routing instructions of a more general nature, using the standard NCS identifier MERWARN DIVERSION ORDER.

Example:

A. MERWARN DIVERSION ORDER
B. English Channel closed. All shipping in North Sea remain north of 052 degrees N until 031500ZSEP1999.

800W. Other Warnings

ATP-2, Vol II, gives instructions for the display of signals by ships which have received a MERWARN NBC 3 NUC message which affects their area. Ships arriving from sea but remaining beyond visual/aural range of shore stations should continue to keep radio watch in order to receive MERWARN messages.

800X. Ground Zero

The point at the surface on sea or land immediately below or above a nuclear explosion is called Ground Zero (GZ).

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800Y. Effective Downwind Direction and Downwind Speed

Winds in the atmosphere vary considerably with height, both in direction and speed, and have a major influence on the distribution of radioactive fallout from a nuclear cloud.

The worst contamination will fall to the surface along a path represented by the average wind between the surface and the middle of the nuclear cloud.

Based upon meteorological information on the wind conditions in the airspace between the surface and the height of the nuclear cloud, NBC Collection Centers will compute the average direction and speed of the radioactive particles' path from the nuclear cloud to the surface.

The results of this computation make up the fallout prediction, expressed in the terms of effective downwind direction and speed. It should be noted that the direction of the effective downwind is the direction towards which the wind blows. This direction is also known as the fallout axis.

The surface wind will usually be considerably different from the effective downwind, both in direction and speed, and the surface wind should never be used to estimate the drift of fallout.

800Z. Fallout Pattern Criteria

The predicted fallout area consists of two zones, Zone 1 and Zone 2, with the following characteristics:

- Zone 1 is the zone of immediate concern. Within this zone there will be areas where exposed, unprotected personnel may receive doses of 150 cGy (rads) or greater, within 4 hours. Casualties among personnel may occur within portions of this zone.
- Zone 2 is the zone of secondary hazard. Within this zone the total dose received by exposed, unprotected personnel is not expected to reach 150 cGy (rads) within a period of 4 hours after the actual arrival of fallout, not even when the radioactive fallout remains on the deck of the ship.

Outside these two zones the risk will be negligible.

800AA. Fallout Plotting in Merchant Ships

When a nuclear explosion is reported in a MERWARN NBC 3 NUC message, the Master of a merchant ship should immediately plot the fallout area on a chart, using the information contained in the message. A plot example accompanies the next section.

When a MERWARN NBC 3 NUC is not available (for example, when a nuclear detonation is observed from the ship) the data contained in the current MERWARN NBC EDM should be used. The plotting procedures are almost identical in the two cases.

For purposes of simplification, merchant ships are to use cloud radii and safety distance as follows:

- Plotting from MERWARN NBC EDM: Use cloud radius 10 nautical miles and safety distance 15 nautical miles in all cases.

- Plotting from MERWARN NBC 3 NUC: Use the cloud radius given in the MERWARN NBC 3 NUC and, in all cases, a safety distance of 15 nautical miles.

Plotting should be performed in the following manner:

- Plot the location of the detonation (ground zero) on the chart. Look up the fourth and fifth field of set PAPAB (left and right radial line of the fallout area) and calculate the bisector. This line is the equivalent to the downwind direction. Draw a downwind axis from GZ in the downwind direction, as calculated above. Draw two additional downwind radial lines from GZ, 20° to either side of the downwind axis.
- Using GZ as center and the downwind distance of Zone 1 (second field of set PAPAB) as radius, draw an arc between the two radial lines on each side of the downwind axis. Draw a second arc between the radial lines to represent Zone 2, doubling the downwind distance for radius.
- Using GZ as center, draw a semicircle upwind (opposite the downwind axis and radials) using the cloud radius (third field of set PAPAB).
- From the intersections of the Zone 1 arc with the two radial lines, draw straight lines to the ends of the cloud radius semicircle.
- To determine the area in which fallout deposition is predicted to occur at any given time after the detonation:
- Multiply the effective downwind speed (first field of set PAPAB) by the time after the burst (in hours), the result being a distance in nautical miles.
- To and from this distance add and subtract a safety distance of 15 nautical miles to allow for finite cloud size, diffusion, and wind fluctuations. The result will be two distances.
- With GZ as center and the two safety distances obtained above as radii, draw arcs across the plotted fallout area.
- The area enclosed between the two arcs will contain, in most cases, the area of deposition of fallout at this particular time after the burst.

800AB. Plotting from MERWARN NBC 3 NUC

Example:

Given:

MERWARN NBC 3 NUC

ALFA/UK/NBCC/09-001/N//

DELTA/091715ZSEP1999//

FOXTROT/PLYMOUTH/AA//

PAPAB/018KTS/040NM/05NM/275DGT/315DGT//

Problem: Determine the predicted fallout area and the area within which fallout is predicted to deposit at the surface at 091845ZSEP1999.

Solution (See figure.):

- On the chart plot GZ. Calculate the downwind direction 295 degrees as bisector from left and right radial line (from set PAPAB, fourth and fifth field). Draw a downwind axis from GZ on a bearing of 295° for a

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- distance of 80 nautical miles. Draw two radial lines from GZ, bearing 275° and 315° , both 80 nautical miles long. (80 is twice the downwind distance of Zone 1.)
- Using GZ as center, draw arcs between the radial lines at 40 nautical miles downwind to mark Zone 1, and at 80 nautical miles downwind to mark Zone 2.
 - From the third field of set PAPAB, the cloud radius is 5 nautical miles. With GZ as center and 5 nautical miles as radius, draw the cloud radius semicircle upwind of GZ.
 - From the intersections of the Zone 1 arc with the radial lines, draw straight lines to the ends of the cloud radius semicircle.
 - 091845Z is 1.5 hours after the burst. From the first field of set PAPAB, obtain the effective downwind speed; 18 knots:
 $18 \text{ kts} \times 1.5 \text{ hr} = 27 \text{ nautical miles.}$
The safety distance is always 15 nautical miles.

- $27 + 15 = 42$ nautical miles, and $27 - 15 = 12$ nautical miles.
- With GZ as center and 42 and 12 nautical miles as radii, draw arcs across the fallout pattern. The area enclosed by the two arcs and the boundary of the pattern is the area within which fallout is predicted to deposit at the surface at 091845ZSEP1999.

800AC. Contamination Plotting in Merchant Ships

- When a chemical attack is reported in a MERWARN NBC 3 CHEM message, the following procedure should be followed:
- Plot the location of the attack from the details in set FOXTROT.
 - Plot the coordinates or radius of the circle contained in set PAPAA.

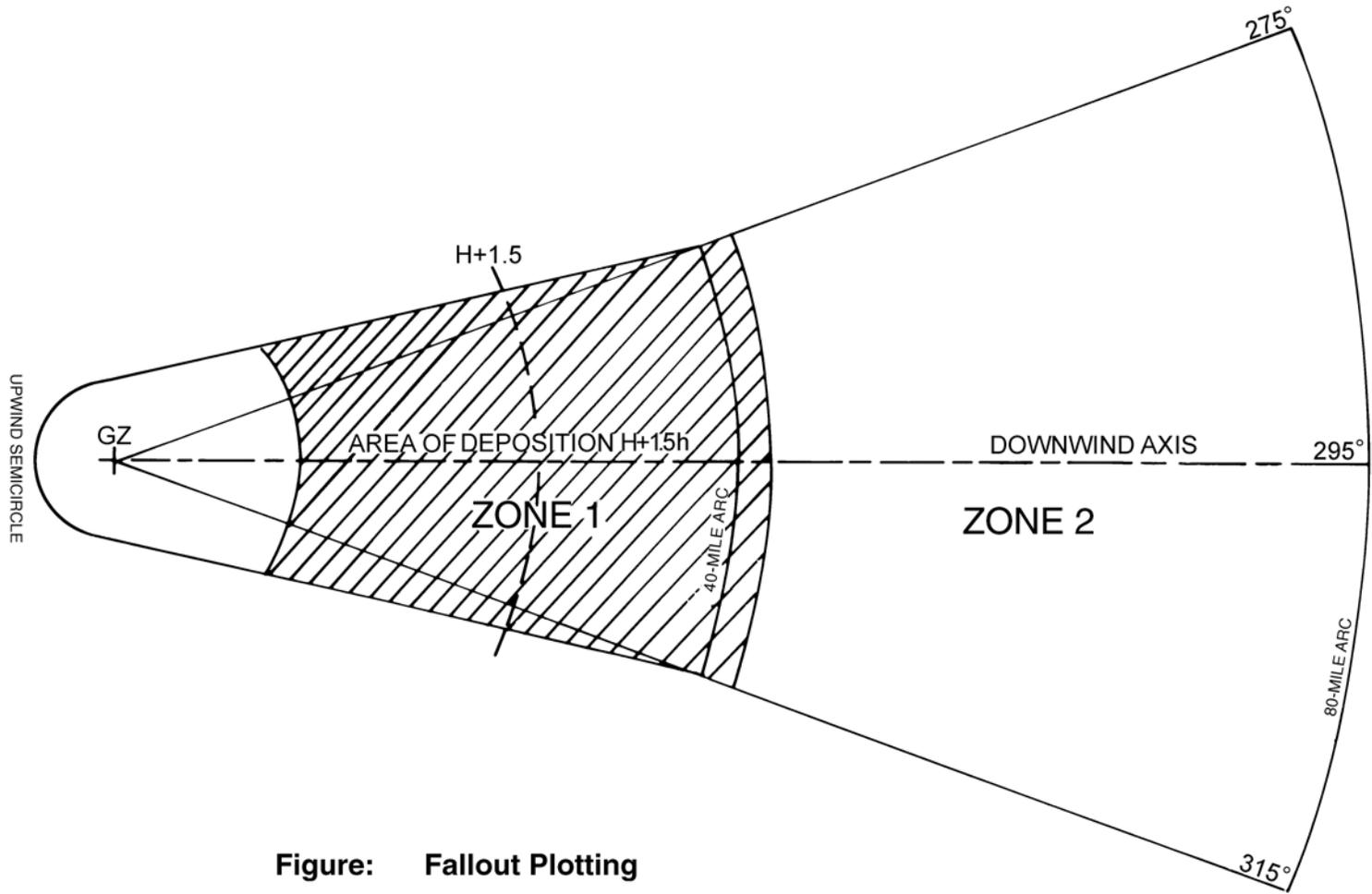
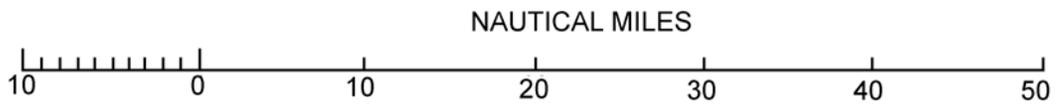


Figure: Fallout Plotting



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APPENDIX A

INSTRUCTION TO MASTERS IN AN EMERGENCY ON DEFENSE AGAINST NUCLEAR FALLOUT

Attacks with nuclear weapons may be expected on land targets adjacent to your route. Such attacks are likely to result in radioactive fallout being deposited over large areas of sea, through which you may have to pass. It may be possible to issue a general warning to indicate which areas are likely to be dangerous at any particular time.

As fallout will probably be in the form of fine dust which may be invisible, you should observe the following precautions during nuclear fallout.

If your ship is equipped with the necessary instruments to detect fallout, these precautions may be relaxed accordingly.

PRECAUTIONS TO BE TAKEN: If your ship has a prearranged radioactive countermeasure plan prepared, ensure that all measures laid down in that plan are carried out. If no such plan is in existence, improvise measures as indicated below:

- Select a group, or groups, of compartments as low in the ship and as far removed from the ship's side as possible within which the crew can take shelter. These spaces should be equipped with washing and lavatory facilities, and sufficient food should be stowed there to last for the passage through the dangerous area. Spaces selected should be capable of being completely shut down with all ventilation and other openings secured.
- Strike below or cover as much gear on the weather decks as possible, particularly absorbent materials such as line, awnings, etc. Ensure that food stores and galleys are secured with all openings closed. Stop all ventilation fans and close or cover all ventilation and other openings which are not essential for running machinery and continued steaming. In the absence of suitable closures, the use of canvas covers, adhesive tape, etc., is recommended.
- Rig all available fire-fighting and deck washing hoses and nozzles to spray water continuously over as much of the weather decks and superstructure as possible, to prevent contamination settling. If complete coverage is impossible, concentrate effort on the navigating position, over the top of the shelter position(s), and above the machinery spaces.
- If a continual spraying of the upper works is impracticable, organize working parties at frequent intervals to wash down the weather decks and superstructure to reduce the buildup of contamination.
- Reduce the number of your crew who must remain on the weather decks or in positions near the weather decks, or in machinery spaces, to the bare minimum required for safe steaming, and keep the remainder in the selected shelter position(s).
- Ensure that all who must remain in exposed positions (including machinery spaces, unless ventilation can be stopped) are fully clothed, preferably in foul weather clothing, with all the skin covered so far as practicable.
- During the passage, so far as the numbers of appropriately skilled personnel allow, change around those manning exposed or relatively unsheltered positions (including the machinery spaces) as often as possible in order to spread the radiation dosage. Remember that this advice also applies to the Master, who should take as much shelter as the safe navigation of the ship will permit.
- Ensure that all who have been exposed remove at least their outer clothing on returning to shelter, wash thoroughly their exposed skin (especially hands, face, and neck) as soon as possible, and in any case before drinking or eating.
- Restrict unnecessary movement throughout the ship to minimize the possible spread of contamination.
- Unless absolutely necessary, do not distill water for drinking while in a dangerous area.
- As soon as possible after clearing a dangerous area, carry out a thorough hosing down of the all weather decks and superstructure.