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**TECHNICAL MANUAL**

**OPERATIONAL PROCEDURES  
FOR THE ARMED SERVICES  
BLOOD PROGRAM ELEMENTS**

Approved for public release; distribution is unlimited

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**HEADQUARTERS, DEPARTMENTS OF THE  
ARMY, THE NAVY, AND THE AIR FORCE  
1 SEPTEMBER 2007**

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WASHINGTON, DC 1 September 2007

## **OPERATIONAL PROCEDURES FOR THE ARMED SERVICES BLOOD PROGRAM ELEMENTS**

You can help improve this manual. If you find any mistakes or if you know a way to improve procedures, please let us know. Mail your memorandum or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to the Armed Services Blood Program Office (ASBPO), 5109 Leesburg Pike, Falls Church, VA 22041-3258.

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## **CHAPTER 1 INTRODUCTION**

### **1-1. Purpose**

a. The Armed Services Blood Program (ASBP) is a joint program operated by the Services and coordinated by the Armed Services Blood Program Office (ASBPO). The instructions contained in this manual:

(1) Provide guidance and procedures for the collecting, processing, storage and shipment of blood for the Armed Services as directed in Department of Defense (DOD) Instruction 6480.4.

(2) Provide standardization among the Services and enhance the total blood distribution system (Figure 1-1) in peace and war.

(3) Describe the operations of the Blood Donor Centers (BDCs), Armed Services Whole Blood Processing Laboratories (ASWBPLs), Expeditionary Blood Transshipment System (EBTS), Blood Support Detachments (BSDs), Blood Product Depots (BPDs), and Deployable Medical Treatment Facilities (MTFs).

(4) Identify manpower requirements and capabilities for the ASWBPLs, EBTS, and BSDs.

b. Each of the blood elements described in this manual is a vital link in the blood transportation chain, thus providing the right blood product to the right place at the right time in the right amount and at the right temperature.

(1) The Air Force, Army, and Navy operate BDCs to provide adequate blood products for local use, shipments to other military facilities, theaters of operation, and interchange with Veteran's Administration hospitals and local civilian blood banks as necessary.

(2) The ASWBPLs and EBTS provide a central point for storage and inventory assessment of blood products. They further ensure the timely distribution of clinically safe and effective blood products, particularly during contingency and mobilization operations.

(3) The BSDs are designated by the combatant commands (COCOMs) to provide blood products within a given geographical area of the command area of responsibility (AOR).

(4) The BPDs are fixed facilities located in designated COCOMs to store frozen blood and other products.

(5) The Deployable MTFs are designated by the COCOMs to provide medical care within a given geographical area of the command AOR.

c. The prescribed measures and techniques listed in this manual must be adhered to and every effort must be made to provide adequate blood products, for local use, for shipments to other military MTFs and commercial processing laboratories, for interchange with civilian blood banks and civilian hospitals as the occasion warrants, and for contingencies and war requirements.

## **1-2. References**

Referenced publications are listed in Appendix A.

## **1-3. Abbreviations and Definitions**

Abbreviations and terms used in this publication are explained in the Glossary.

## **1-4. Standardization**

In the operation of these blood program elements, there must be standardization of procedures in order to provide the safest blood products available. Military BDCs, ASWBPLs, EBTS, BSDs, BPDs, and MTFs must operate according to Title 21, Code of Federal Regulations, Part 211, Current Good Manufacturing Practices, and Parts 600-799, Food and Drugs. They will also operate under the requirements of FM 4-02.70/NAVMED P-5120/ AFMAN 41-111 and TM 8-227-3/NAVMED P-5101/AFMAN 41-119. (These publications are published by the AABB (formerly the American Association of Blood Banks) and represent minimal performance guidelines). Program elements must follow guidance provided by the Office of the Assistant Secretary of Defense for Health Affairs (ASD(HA)), Joint Staff, ASBPO and respective Service Blood Program Offices (SBPOs). The Defense Blood Standard System (DBSS) or Theater DBSS will be the system of record for management of blood operations, when available.

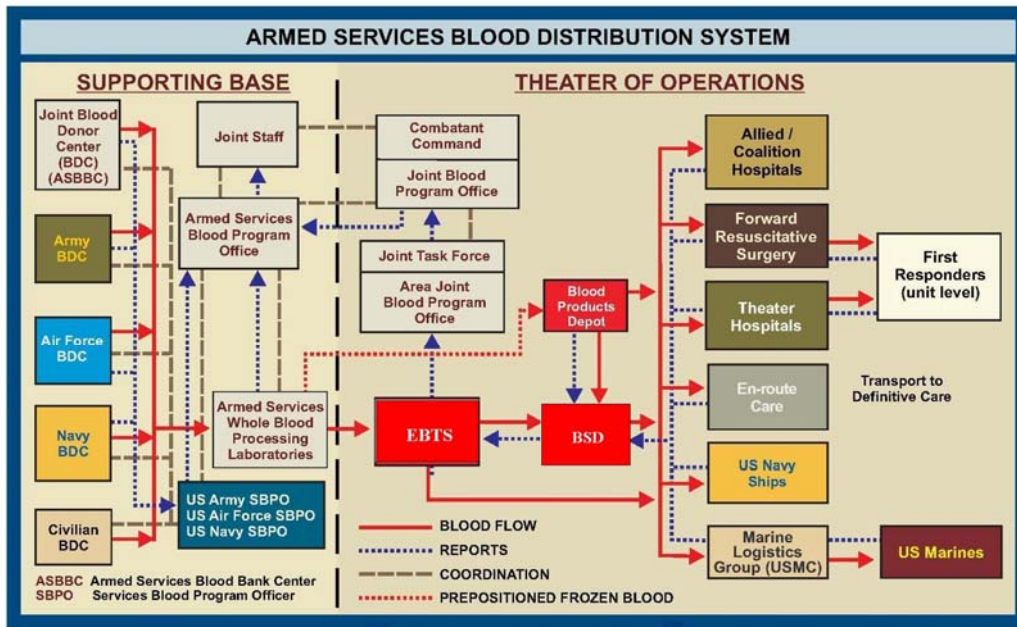


Figure 1-1 Armed Services Blood Distribution and Reporting System

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## CHAPTER 2 BLOOD DONOR CENTERS

### 2-1. General Instructions

a. Purpose. BDCs collect, process, and provide blood products for local or global use. They also train medical personnel in blood product preparation.

b. Responsibilities.

(1) Operation of each BDC is the responsibility of the military medical commander at the installation where the BDC is located. It is the commander's responsibility to ensure that:

(a) Appropriate support and resources are made available to recruit adequate donors for the mission.

(b) Proper medical care is given to all blood donors.

(c) Persons are deferred as donors who do not meet the requirements established by regulatory or accreditation agencies or who are disqualified for other reasons.

(d) Technical operation of the BDC is carried out by qualified personnel. BDC staffing is determined by each Service.

(2) It is the BDCs' responsibility to—

(a) Follow their respective Service's standard operating procedures (SOPs).

(b) Operate in accordance with all regulations, standards, and guidelines of regulatory and accreditation agencies, including the Food and Drug Administration (FDA), the AABB, the College of American Pathologists (CAP) and the Center for Clinical Laboratory Medicine (CCLM).

(c) Maintain and store all blood bank paper or electronic records as directed by FDA regulations and/or AABB standards.

(d) Conduct lookback investigations when directed by the Service Blood Program Officer (SBPO). BDCs will notify the SBPO of any locally generated "lookback" investigations, as required.

(e) Submit a monthly electronic Operational Data Reporting System (ODRS) report.

(f) Deploy, utilize, and upgrade the DBSS computer.

(g) Route all responses to FDA, AABB, and inspector general inspections through the SBPO.

(3) SBPOs are responsible for designating specified BDCs to provide blood products to the ASWBPLs on a continuous basis to meet worldwide contingencies.

(4) Military medical commanders whose BDCs have been given blood quotas are responsible for meeting them in order to maintain medical readiness. Blood taskings for wartime and peacetime are a priority over all other requirements, including local blood needs.

## **2-2. Blood Collection and Manufacturing**

a. Blood drives shall be scheduled and conducted in order to maximize the military donor base under the ASBP. Military BDCs shall be given preferential access to installation donors whenever the donor base is not maximized before installations are opened up to civilian collections.

b. Complete a DD Form 572 (Blood Donation Record), or equivalent, for each donation or potential donation. The DD Form 572 correlates the donor to the corresponding donor unit number. This is a permanent record maintained on file by the BDC for the purpose of donation documentation and possible lookback procedures.

c. Donors must meet current FDA regulations and AABB standards. Donors will be screened using donor criteria specified in FM 4-02.70/NAVMED P-5120/AFMAN 41-111, FDA guidance, and supplemental guidance from the ASBPO or Service blood programs.

d. Blood will only be collected in stocklisted collection/dispensing bags containing approved anticoagulants (e.g. CPD) and additive solutions (e.g., AS-1). At least four segments shall be attached to each unit of blood.

e. All blood will be processed and tested serologically in accordance with current regulatory agency guidelines. Donors will be notified of confirmed positive or reactive results as directed by the FDA and/or AABB. The names of serologic positive/reactive donors will be annotated in a deferral/surveillance roster.

f. Blood products will be labeled according to AABB and FDA requirements.

## **2-3. Blood Storage and Shipment**

a. BDCs will use standardized forms and operating instructions identified by their SBPO. Whenever possible, DBSS will be the system of record, alternatively standardized manual blood bank forms (e.g., DD 572, SF 518 (Medical Record-Blood or Blood Component Transfusion), and DD 573 (Shipping Inventory of Blood Products)) shall be

used. Records must meet FDA regulations and guidance, as well as that of the appropriate civilian accreditation agency (e.g., AABB).

b. Transfusable blood is shipped to the ASWBPL or other locations as directed by the SBPO.

c. Liquid red blood cells (RBCs) will be stored at a temperature of 1 to 6 degrees Centigrade (°C). Fresh frozen plasma (FFP), Plasma frozen within 24 hours after phlebotomy (PF24) and cryoprecipitate storage will be at -18 °C or colder. Frozen RBC unit storage will be at -65 °C or colder. Refrigerators and freezers used for storage will have an audible alarm, emergency power source, and a continuous temperature recording system.

d. BDCs will ship blood products using standard procedures and DBSS, DD Form 573 or equivalent as documentation of shipment. Complete one document for each container in the shipment. The shipping facility will maintain one copy of the document and send two copies with the shipment container.

e. BDCs will pack up to 30 liquid RBC units in a reusable cardboard and styrofoam standard liquid shipping container. Cover liquid blood products with 14 pounds or more of CUBED WET ice, double bagged with sufficient absorbent material and secured to maintain temperatures of 1 to 10 °C for 48 hours. Up to 15 units of FFP/PF24 or 30 units of cryoprecipitate may be packed in the shipping container. Cover FFP/PF24/cryoprecipitate with 20 to 30 pounds or more of pelleted dry ice to maintain temperatures at -18 °C or colder for 48 hours. Up to 12 frozen RBC units may be packed in the shipping container. Cover frozen blood products with 20 to 30 pounds or more of pelleted dry ice to maintain in a frozen state for 48 hours. If using an alternate shipping container, prepare per manufacturer's guidelines and validated procedures.

f. Transportation arrangements should be made to allow blood to be received at the ASWBPLs within 24 hours after shipment. RBCs shipped to an ASWBPL should be received no later than 7 days after they were collected. Frozen products should arrive at ASWBPLs with at least 6 months remaining shelf life.

g. The shipping BDC will notify the ASWBPL of the incoming shipment by submitting an ASWBPL produced shipping notification document and other shipping documents by fax or electronically to the receiving ASWBPL. If a civilian facility ships units for a BDC, the BDC is responsible for notifying the ASWBPL of the incoming shipment. In the event fax and electronic capabilities are not available, a minimum of a telephone call is made to ASWBPL. If a self-generated form is used, it must contain the following information: donor center's name, number of boxes in the shipment, date of arrival, carrier, and airbill or tracking number. Outbound shipping costs will be borne by the shipping BDC.

h. When the containers are received, the receiver will note product temperature and shipment conditions, especially those rendering the products unusable, on the enclosed DD Form 573 or shipping document. The receiver will permanently maintain one copy of the completed shipping document. The second copy will be returned to the shipper who should use the information for quality improvement purposes and retain it on file permanently.

**CHAPTER 3**  
**ARMED SERVICES WHOLE BLOOD PROCESSING LABORATORIES**

**3-1. General Instructions**

a. Purpose. ASWBPLs are continental United States (CONUS)-based facilities which provide intermediate storage, testing, and shipment of blood products as designated by the ASBPO.

b. Responsibilities.

(1) The Secretary of the Air Force, or designee, will—

(a) Establish ASWBPLs at or near air terminals located in CONUS. At least two ASWBPLs will be equipped and staffed for fulltime peacetime operation.

(b) Coordinate the joint staffing by medical personnel of the Army, Navy, and Air Force according to the staffing criteria in Appendix B.

(c) Program, budget, and finance all costs of maintenance, air transportation of blood products to the aerial port of debarkation (APOD), operations, and training of the ASWBPLs except the pay, allowances, and permanent change of station travel of the Army and Navy personnel assigned.

(d) Provide administrative support for the ASWBPLs.

(e) Obtain concurrence from the ASD(HA) through ASBPO prior to closing or deactivating an ASWBPL.

(f) Coordinate the transport of blood products from the ASWBPL to the ASBPO-designated location.

(2) The Secretaries of the Air Force, Army, and Navy, or their designees, will—

(a) Provide appropriate medical personnel to staff the ASWBPLs in peacetime.

(b) Specifically identify personnel designated to staff ASWBPL contingency positions, as specified in Appendix B. As a minimum, Air Force personnel will conduct annual exercises involving these personnel to ensure familiarity with operational procedures.

(3) The Secretary of the Army, or designee, shall contract for acquisition of blood from civilian sources, including shipment, when blood requirements exceed Service capabilities, as determined by the ASBPO.

(4) The Air Force Surgeon General will request activation of and contingency manning for each ASWBPL through the Joint Staff. The Joint Staff will task the Services to support the activation and contingency manning. The ASBPO will provide blood requests and supply coordination, shipment authorization, and technical guidance.

### **3-2. Blood Requests and Data Reporting**

a. The ASWBPLs will fill blood requests as designated by the ASBPO. During peacetime operations, medical facilities may supplement their blood product needs from the ASWBPLs on an "as available" basis according to their Service policies.

b. Blood products may be requisitioned from the ASWBPLs by COCOMs, joint task forces, or by the SBPOs. Requests should be sent to the Director, ASBPO with an information copy to the ASWBPL. The ASBPO will prioritize the requirements and coordinate the response of the ASBP as needed.

c. The ASWBPLs will provide necessary data and operational reports as designated by the ASBPO, with copies to the COCOM Joint Blood Program Offices (JBPOs), and SBPOs.

### **3-3. Blood Receipt and Storage**

a. Blood products received by the ASWBPLs will be inspected and stored according to FDA requirements and AABB standards per paragraph 1-4.

b. Shipment conditions and inspection results will be recorded on the shipping document. The ASWBPLs will file one copy of the completed document and return one copy to the shipping facility. Repeat or other significant errors will be brought to the attention of the appropriate SBPO.

c. Liquid RBC units received by the ASWBPLs will be tested to verify the ABO blood groups and Rh types (if negative) indicated on the product labels. Discrepancies will be reported to the appropriate BDC for resolution. Unit(s) will be quarantined until the discrepancy is resolved or destroyed.

### **3-4. Blood Shipment**

a. The ASWBPLs will arrange shipment of blood products via military or commercial transportation so that shipments arrive at their intended location within the required time frame. Military transport to COCOM locations will be arranged through Transportation Command/Air Mobility Command (TRANSCOM/AMC) channels and may require COCOM Surgeon input to arrange special transportation.

b. Shipments will be prepared per paragraph 2-3. All shipments made by military aircraft will have DD Form 1502 (Frozen Medical Material Shipment (Perishable-Keep Frozen), or 1502-1, (Chilled Medical Material Shipment (Perishable Keep Chilled)), annotated and attached to instruct special handling personnel about re-icing requirements. Technical data on shipping containers and the 463L pallet is provided in Appendix C. Enroute blood shipments must be re-iced every 48 hours. Liquid blood products will be re-iced with 14 pounds of cubed wet ice and frozen products with 20 to 30 pounds of pelleted dry ice. The ASWBPLs will send shipment information to receiving locations via message format designated by the ASBPO.

c. During contingency operations, and with the consent of the ASBPO, the ASWBPLs may discontinue routine operations to include the routine shipment of frozen red cell products for pre-positioning.

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## CHAPTER 4 EXPEDITIONARY BLOOD TRANSSHIPMENT SYSTEM

### 4-1. General Instructions

a. Purpose. The EBTS is managed by the Air Force at primary air terminals within the theater of operations as approved by the COCOM. The EBTS functions as an intermediate receiving, inspecting, re-icing, storing, and distributing facility for liquid and frozen blood products sent from the CONUS ASWBPLs, theater BPDs or other EBTS. Products are forwarded to BSDs, other EBTS or MTFs when required. EBTS provides daily blood reports (BLDREPs) to their respective Area Joint Blood Program Office (AJBPO) or JBPO. The overall objective is to standardize EBTS operations worldwide. An EBTS may also function as a BSD.

#### b. Responsibilities.

(1) The Secretary of the Air Force will establish EBTSs at air terminals located outside the continental United States (OCONUS) upon request of the COCOM through the Joint Staff to the Air Force Surgeon General. The determination of numbers and locations of EBTS will be coordinated by the COCOM JBPO, Joint Staff, and ASBPO. Funding for operations and maintenance (in standby or operational status) is the responsibility of the Air Force.

(2) The Air Force will identify, staff, and fund sufficient personnel and equipment to operate the EBTS. Exercises will be conducted at least annually to ensure personnel are familiar with administrative and operational procedures. Training is coordinated through the Air Force Blood Program Office and provided by ASWBPL West.

(3) The EBTS is modular in design and capability. The addition of the subsequent modules incrementally adds throughput capability. The EBTS consists of three Unit Type Codes (UTCs) or modules; FFBP1 (Module 1), FFBP2 (Module 2), FFBP3 (Module 3), and one equipment set, FFBE1. The EBTS teams are comprised of the team chief (laboratory officer) as well as medical laboratory and medical materiel craftsmen and journeymen. These teams are normally employed to an expeditionary or an in-place blood transshipment system; however they may be employed in support of other blood movement components such as the ASWBPL. All members are responsible for the full scope of team activities as directed by the team chief.

(a) Module 1 personnel provide 24-hour operational support of the EBTS in the deployed setting. This module is responsible for setting up and sustaining the equipment set. This module functions as an intermediate receiving, blood inventory management, re-icing, holding, and distribution facility for liquid and frozen products, including packed red blood cells (PRBC), FFP, PF24, cryoprecipitate, and frozen red cells. It can process up to 1000 units of PRBC and 100 units of frozen products daily. The module consists of four personnel.

(b) Module 2 provides increased throughput capability in the form of two additional laboratory technicians. This team normally augments module 1 and is employed when the daily throughput is between 1000-2000 units of PRBC and 100-200 units of frozen products.

(c) Module 3 provides increased throughput capability in the form of two additional laboratory and one medical materiel technician. This team normally augments modules 1 and 2 and is employed when the daily throughput is between 2000-3000 units of PRBC and 200-300 units of frozen products.

(4) The EBTS will be responsible to the theater commander's blood program through the COCOM JBPO. They will be activated only during contingencies, emergencies, and exercises, and will be operational within 24 hours of an activation order by the COCOM JBPO through command channels. The COCOM JBPO will provide coordination and technical guidance for the EBTSs.

#### **4-2. Blood Receipt**

a. Upon receipt of a Blood Shipment Report (BLDSHIPREP) notifying the EBTS of an inbound shipment, contact the local transportation authority and coordinate blood pickup and transport from the aerial port to the EBTS.

b. Advise the Aerial Port Squadron (APS) of the shipment and of any discrepancies.

c. Advise the blood shipper by immediate message of blood receipt and any discrepancies.

d. Upon receipt of the blood pallet from aerial port personnel, remove the cargo net and any cover and unload the pallet.

e. Review the accompanying DD Form 1502-1 or DD Form 1502 attached to the wooden placard or blood shipment containers. Depending on the next required re-icing time, the following should be accomplished:

(1) If re-icing is not required for another 24 to 48 hours, the liquid RBC boxes may be stored in the walk-in refrigerator, or non-refrigerated shelter area, without inspection.

(2) If re-icing is required within the next 24 hours, the liquid red cell boxes should be inspected for proper temperature (1 to 10 °C) and unit appearance and stored in the walk-in refrigerator or re-iced immediately.

f. Blood inspections should also involve ensuring liquid RBC units were not frozen (below 1 °C) during shipment. Liquid blood below 1 °C or above 10 °C should be destroyed and records of destruction maintained.

g. FFP/PF24/cryoprecipitate and frozen red cells should be taken out of their shipping containers and stored in freezers (-18°C or colder or -65 °C or colder, respectively).

Any left over dry ice should be collected in blood boxes, taped closed, and placed in freezers or refrigerators for later use in shipping.

#### **4-3. Blood Storage**

a. Liquid red cell units should be left in the insulated blood shipment containers and placed in the walk-in refrigerator at a temperature of 1 to 6 °C. Stored in this manner, re-icing will not normally be required for up to 4 days. The refrigerator will have a tamper proof audible alarm system, a temperature recording system, and a remote alarm activation in a constantly manned area. A daily inspection procedure for manually checking and documenting refrigerator temperatures will be accomplished. Similar considerations apply to the maintenance of frozen blood products.

b. In the absence of a 24-hour temperature recording system, the following procedures should be used to detect unexpected thawing of frozen blood products.

(1) Fill a test tube half full of water and freeze.

(2) After freezing the water in the test tube, invert the test tube and place it in a rack in the freezer.

(3) Inspect the test tube on a daily basis to ensure that the frozen water has remained in the upside down position. Water at the base of the test tube indicates that some thawing has occurred, and appropriate action must be taken.

c. Liquid red cell units may also be stored in the insulated blood shipment container outside of the walk-in refrigerator when properly packaged with 14 pounds of wet, cubed ice. Stored in this manner, re-icing will not normally be required for up to 48 hours. Environments having high or low extremes in ambient temperatures will require more frequent inspections (every 24 hours) to ensure that the units do not freeze or that ice is not melting at an extremely high rate.

#### **4-4. Blood Shipment**

a. The COCOM JBPO will identify shipping requirements to the EBTS.

b. Shipments will be prepared per paragraph 2-3. All shipments made by military aircraft will have a DD Form 1502 or 1502-1 annotated and attached to instruct special handling personnel about re-icing requirements.

c. BSDs and MTFs will obtain or transport blood product shipments from the EBTS as instructed by the COCOM JBPO. The EBTS will send shipment information to the receiving locations via message format or as directed by the JBPO.

d. EBTS setup is flexible and may be varied to meet local conditions. Figure 4-1 shows a recommended setup and sequence for workstations to complete the pallet build. The sequence is explained below.

(1) *Station #1 (one person).*

(a) Open the blood shipment container.

(b) Remove the enclosed ice bag and pass the ice bag to Station #2.

(c) Annotate the blood group of units found inside the blood box on the outside of the container if not already marked with blood label (use large black marker or blood group and type label).

(d) Prepare each blood box for a temperature check. Select two blood bags from different sides of the blood box. Place the two bags together with the labels facing outward. Place a thermometer's temperature probe snugly between the two bags (taking care not to puncture the bags) and secure the two bags with a rubber band, with the thermometer sandwiched between them. Return the sandwiched bags to the box. Other validated methods for verifying temperature of products can be used based on a local validated SOP.

(e) Remove the enclosed shipping document (i.e. DD Form 573 or equivalent) from the packing list envelope taped to the cardboard box flaps or located elsewhere within the shipping container. Tape the shipping document to the top side of the styrofoam lid. Replace the styrofoam lid on the box.

(f) Place the container on the table at Station #3. Note: Depending on the distances involved, the conveyor could be used to transport the boxes from Station #1 to Station #3, as shown in figure 4-1.

(2) *Station #2 (one person).*

(a) Drill small holes in the bottom of a small office type trash container or 14-quart plastic pail to allow for draining of water. Weigh the empty trash can. Add ice until 14 pounds of ice has been added. Level the ice and draw a water-proof mark around the inside of the trash can equal to the height of the 14 pounds of ice.

(b) Tape a large kitchen colander across the top of a large 32-gallon trash container or other suitable container by the corner handles (the colander should be hanging over the open part of the large trash container). The small office type trash container or pail, with holes drilled through the bottom, is placed in the colander.

(c) Take the old ice bags provided by Station #1 and cut off the electrical ties or filament tape. Care should be taken not to cut the plastic bag so that the bag can be reused if not otherwise damaged.

(d) Empty the remaining ice and water into the small office type trash can or pail. Excess water will drain through the holes in the can into the large trash container, leaving all remaining usable ice in the trash can or pail.

(e) Fill the small office type trash can or pail with additional ice up to the level marked in step (2)(a) above. This should equal approximately 14 pounds of ice.

(f) Pour the 14 pounds of ice into one plastic bag and press all air out of the bag. Twist the end of the bag and put an electrical tie or filament tape tightly around the twist. Note: to save time during re-icing, the electrical ties can be pre-looped. If electrical ties are not available, filament tape may be used instead. Maintaining the twist, bend the twisted end down past the electrical tie or filament tape and place another tie/tape around this bend (below the first electrical tie). Place this bag into another plastic bag and repeat the same procedure. If done properly, this double bag of wet ice will fit snugly over the dividers inside of the blood box.

(g) Place the newly double-bagged ice into the blood box, which personnel from Station #3 have placed on the table at Station #2.

(h) Tape the blood box closed with one piece of tape placed across the box and perpendicular to the box opening.

(i) The Station #4 person will pick up and carry the blood box to Station #4.

(3) Station #3 (one or two persons).

(a) The laboratory technician and possibly one other member should work this station.

(b) Read temperature and remove thermometers from boxes. The shipping document will be annotated with the date, time, and temperature inside of the container. All information recorded on each blood product label will be checked for agreement with its corresponding shipping document. Red cell products will be checked for any evidence of unsuitability (bag integrity, hemolysis, presence of clots, clerical errors in labeling, etc.). Frozen blood products must maintain a frozen state and will be inspected for evidence of thawing. Twenty pounds of pelleted dry ice per box is required. Add pelleted dry ice to each box as required and replace frequently. Frozen blood boxes should be checked very rapidly to minimize the warming of the inside of the blood container. Discrepancies will be noted on the shipping document and brought to the attention of the supervisor.

(c) The top carbon copy of the shipping document, which is taped to the top of the styrofoam box, will be removed for the inventory control. If only one copy of the shipping document is available, then document, on a locally-devised inventory form, the number and type of units in the box.

(d) Record the technician's name, date, and temperature on the shipping document.

(e) Place the shipping document inside the packing list envelope on the bottom of the cardboard flap. If envelope is not located there, affix it there. Place the styrofoam lid on the box and place the box on the table at Station #2.

(4) Station #4 (one person).

(a) Carry re-iced blood box from Station #2 to pallet building area.

(b) Arrange each blood box on a 463L pallet for air shipment or store the box in the walk-in refrigerator as dictated by local inventory management procedures.

(c) Stored resources should be conserved by rotating the blood by date received or expiration date found on the shipping document.

(d) The ASWBPL policy is to annotate the blood group and type on the outside of each box when building a pallet of blood products. Inventory should be stored by blood group and type and arranged in a manner that the first shipment in is the first shipment out.

e. Blood products which fail inspection or are broken in shipment will be properly bagged and sent to the nearest medical waste disposal facility; records of their disposal will be maintained.

f. Personnel should assist other stations as required.

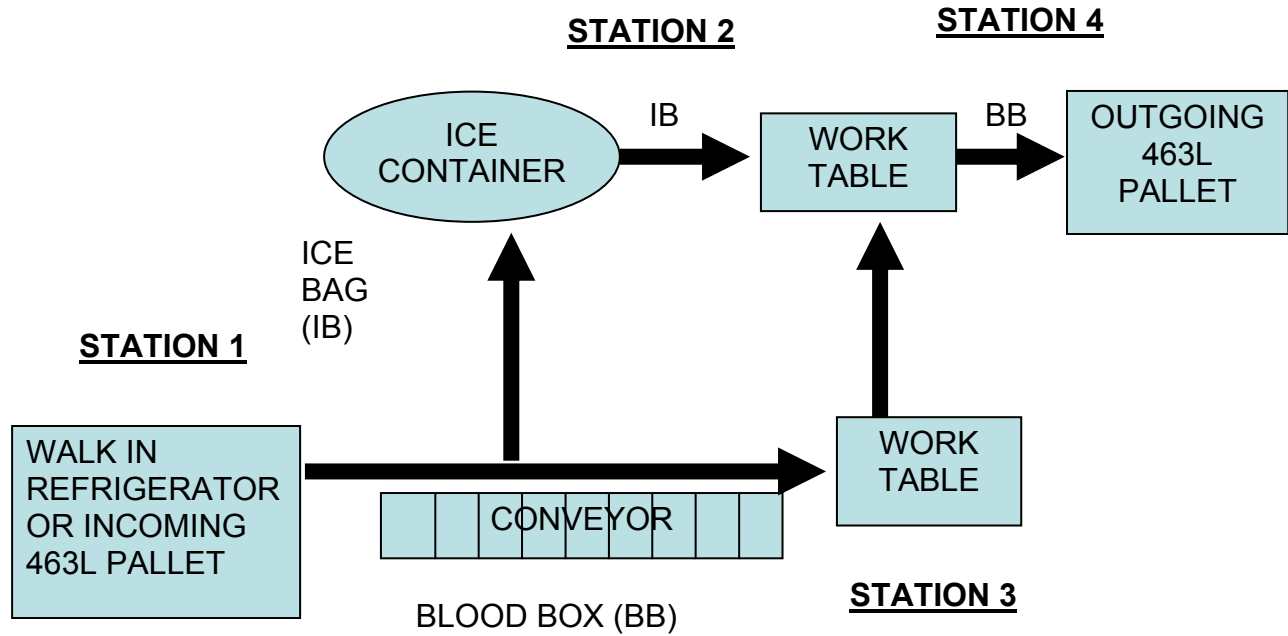


Figure 4-1 EBTs Shipment and Pallet Preparation Setup

#### 4-5. Communications

a. EBTs have requirements for secure communications with both supporting and supported units. Communication within the blood distribution channels will use the ASBPO standard joint text message traffic formats contained in Joint Pub 4-02 and MIL-STD 6040 (See Appendix D).

(1) BLDREP. EBTs, when activated, will submit a BLDREP by Secret Internet Protocol Router Network (SIPRNET) email, immediate message or other encrypted transmission to their designated AJBPO or JBPO. The reporting period will be provided by the AJBPO/JBPO.

(2) BLDSHIPREP. EBTs, when activated, will submit a BLDSHIPREP by SIPRNET, immediate message or other encrypted transmission to the shipment receiver and command personnel as directed. Classification level will be per command instructions.

b. The EBTs is equipped with secure communications equipment which will allow communication to designated units. Direct communication between the EBTs and its supported units is an absolute necessity. Due to the critical nature of many blood requests, the inherent delays caused by communicating through command channels should be avoided.

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## **CHAPTER 5 BLOOD SUPPORT DETACHMENT**

### **5-1. General Instructions**

#### a. Purpose.

(1) The BSD is an intermediate supply point in the distribution of blood between the EBTS and the MTFs for blood products. The mission of the BSD is to provide collection, manufacturing, storage and distribution of blood and blood products to the AOR. The BSD is specific to the Army, but provides Joint support to other services. The determination of the numbers and locations will be in coordination with the COCOM JBPO, the Joint Staff, and the ASBPO. A BSD may be employed as fixed or mobile facility depending on the situation. This chapter provides basic procedures and responsibilities for a BSD. Figure 1-1 depicts the BSD within the distribution system. Note that a BSD supports more than one Service's MTFs.

(2) The BSD has a detachment Headquarters, Collections/Manufacturing section and Storage/Distribution section.

(3) The Officer of the BSD may be designated as the AJBPO for a specific geographic area within an AOR.

(4) The BSD provides support in a specific geographical area regardless of the MTF Service component including forces afloat. It can support up to 12 MTFs as designated by the JBPO.

(5) The Collections and Manufacturing Section of the BSD can collect Fresh Whole Blood and apheresis platelets as needed on an emergency basis in accordance with theater transfusion and Armed Service Blood Program policy.

(6) The Storage and Distribution Section of the BSD receives, stores, processes, and distributes blood products to its supported MTFs within a defined geographical area.

#### b. Responsibilities.

(1) The BSD is responsible to the theater commander's blood program through the COCOM JBPO or AJBPO. It will be activated and operationed according to operation plans (OPLANS) and contingency plans. The theater JBPO will provide coordination and technical guidance for the BSD(s).

(2) Have the capability to store up to 5 days of packed RBCs and FFP/PF24/ cryoprecipitate based on MTF usage rates.

(3) The BSD can receive, re-ice and transship up to 1,000 units of PRBC in 24 hours from the U.S. Air Force EBTS. The refrigerated storage capacity of the section is up to 4,080 units of PRBC. The BSD can distribute up to 33 boxes of PRBC to MTFs and Brigade Combat Team (BCT) and other medical elements daily.

(4) The BSD collects fresh whole blood for emergency situations if so tasked. This is indicated for massive trauma situations. The BSD can collect up to 432 units of whole blood every 24 hours and manufacture 432 units of PRBC every 24 hours after an initial 24 hour delay, while not distributing blood.

(5) Support a BPD if tasked by the COCOM.

(6) The unit may also collect apheresis platelets.

c. Support. The Army Medical Department currently has attached the BSD to the Headquarters and Headquarters Company (HHC), Medical Command (MEDCOM) with further attachment to Medical Brigade (MEDBDE), or Medical Battalion (Multifunctional), TOE 08485G000. The unit has a Commander, who is a certified blood bank officer, trained and specialized in blood bank procedures and trained in BSD activities for both Service specific and joint missions. The detachment has approximately 30 personnel assigned. Most of these personnel are enlisted laboratory technicians trained in blood banking. They are mobile units and can support small and large scenarios.

## **5-2. Blood Receipt, Storage, and Distribution**

a. The identified BSD should be manned, equipped, and supplied to meet its given mission requirements. This manning is not a fixed requirement, but is varied according to the required operations.

b. A BSD will receive its blood from an EBTS and/or a BPD. In some operations and geographical locations, an EBTS/BPD will not be available. In this case, the AJBPO or JBPO will have planned shipments from the ASWBPL to go directly to the BSD. BLDSHIPPREPs may or may not be used at this level. For example, if an EBTS is available, then the BSD may set up routine designated times to pick up blood from the EBTS. Thus no BLDSHIPREP would be necessary. However, BLDSHIPPREPs could be used if warranted.

c. The BSD is responsible for receiving the blood from the EBTS/BPD or the special handling unit at the air head. If the BSD does not have organic transportation assets, then they must arrange transportation for receiving the blood products.

d. Operating procedures for receiving and storing the units are very much the same as that which would be performed at an EBTS (See chap 4). However, at this level, inventory control can become more complex. Since a BSD is supporting medical units of varying types, the amounts and types of blood products will vary considerably. Level II medical units will require group O packed red cells only. This usually includes supporting the Brigade Medical Supply Office within Army BCTs, Forward Surgical

Teams (FST), and Area Support Medical Companies (ASMCs). Depending on hospital requirements, a hospital may require only one box of packed red cells with varying blood groups and types. Thus, the BSD may have to prepare totally new boxes of blood with new shipping documents (i.e. DD Forms 573 or equivalent).

e. Distribution of blood at the BSD level can vary. The BSD may have blood products collocated with a medical logistical forward distribution point to better provide distribution to hospitals located farther forward in the battle area. The BSD has limited transportation assets to distribute blood to the hospitals. Use of existing logistics assets to ship blood is preferred. Non-medical air assets may be used if available. Medical transportation assets, to include ground and air ambulances, are usually available to provide blood products. The AJBPO or JBPO can assist in transportation coordination.

f. It is imperative that the BSD maintain close communication with the AJBPO, the EBTS, and the supported units.

### **5-3. Inventory Control**

a. The BSD Commander or Non-Commissioned Officer in Charge (NCOIC) is responsible for maintaining an adequate inventory of blood products to meet hospital requirements. A minimum of 5 days of supply (DOS) of blood should meet any emergency and should always be on hand at the BSD. A 5 DOS of blood should meet an emergency and should be sufficient if supply lines are temporarily suspended due to damaged roads, bad weather, outdating of blood, loss of blood due to refrigeration, etc. This 5 DOS can best be managed from the hospital BLDREP. For example, a BSD is supporting eight hospitals. Their combined packed red cell request for the next 7 days is 210 units. Dividing that number by seven gives a total 1-day usage rate of 30 units. The BSD should therefore have a minimum of 150 units of packed red cells on the shelf at this time. A look at how much blood was transfused by the hospitals is also a means to determine DOS needed.

b. More than 5 DOS in the BSD is acceptable and desirable as long as unit outdating does not become a problem. It can be expected that by the time a BSD receives packed red cells from the CONUS, there will probably be 3 to 4 weeks' shelf life left on the units. Therefore, BSD should maintain less than 15 DOS of blood, since wastage may occur.

c. Less than 5 DOS can cause extreme logistical problems and can put hospitals at risk of not being able to perform their mission. Anytime that the BSD has less or is expected to have less than 5 DOS of blood products, the Commander or NCOIC should notify the AJBPO/JBPO immediately, in order to provide the BSD with an additional shipment of blood to meet supply requirements.

#### 5-4. Communications

a. The BSD has requirements to communicate with both supporting and supported units. Communications within the blood distribution channels will use the ASBPO standard joint text message traffic formats contained in Joint Pub 4-02 and MIL-STD 6040) (See Appendix D).

b. The BSD will receive daily BLDREPs (see Appendix D) from their supported hospitals. Initial coordination between the hospital and the BSD should be provided by the AJBPO or JBPO. However, it is good practice for the BSD to make direct coordination with their supported hospitals to ensure coordination with given procedures.

c. The BSD is required to submit a BLDREP to the AJBPO or JBPO as well as to their command and control elements. This BLDREP should state the inventory within the BSD as well as blood requested to maintain a 5-day supply of blood. The AJBPO may require the BSD to also show the inventories of the hospitals supported. For example, the BLDINVT line may be done as follows:

```
BLDINVT/32BSD/G/500JQ/50MT/IONT//  
BLDINVT/11ATI-I/1V30JS//  
BLDINVT/121EVAC/IV200JQ/25MT/4NT//
```

This sort of reporting at the BSD level provides input to the AJBPO to determine if there may be a problem at any one location which he or she may be able to assist in. In the example above, the AJBPO knows the BSD is supporting two facilities.

d. The BSD should communicate to the receiving MTF that a shipment of blood is enroute and to expect the shipment. Additional information should be provided to ensure the blood is not lost in transit.

## CHAPTER 6 BLOOD PRODUCT DEPOTS

### 6-1. General Instructions

a. Purpose. The BPDs have been established in certain COCOM AORs to provide storage for frozen RBCs, FFP/PF24, and cryoprecipitate, as needed. The COCOM will designate Service components to establish and operate each BPD. The determination of the numbers and locations will be in coordination with the COCOM JBPO, the Joint Staff, and the ASBPO. The blood products stored in the BPD are theater assets, under the control of the JBPO or the respective AJBPO. Because of the extremely limited mobility of the equipment involved and the difficulty in maintaining the low storage temperatures of the frozen products, BPDs operate as pre-positioned, fixed facilities. The functions of the BPDs are to—

(1) Offset strategic shortages of blood products during the initial stages of an operation until the liquid RBC units can be shipped into the theater.

(2) Receive and store frozen blood products.

(3) Thaw and deglycerolize frozen RBCs.

(4) Distribute frozen blood products, either as frozen units (RBCs, FFP, PF24, or cryoprecipitate) or as deglycerolized RBC units to BSDs and ships afloat.

(5) Serve collaterally as BSDs to store and arrange for the distribution of blood and blood products to MTFs.

(6) Provide daily BLDREPs (when operational) to their respective AJBPOs or JBPOs.

#### b. Responsibilities.

(1) Component commands of the COCOMs are responsible for ensuring that BPDs are maintained, funded, equipped, and supplied during peacetime operation.

(2) Each respective Service will identify, staff, and fund sufficient personnel to operate each BPD.

(3) Each Service will conduct periodic training and competency assessment for personnel in deglycerolization and contingency operation of the BPD to ensure familiarity with administrative and operational procedures.

c. Staffing.

(1) Current staffing strategies for BPDs vary. Some facilities operate using personnel drawn from the U.S. Army Medical Logistics Battalions (MEDLOGBNs). Other facilities operate using personnel detailed from BSDs or MTFs.

(2) Most BPDs are manned well below 100 percent strength in peacetime. Since the first 7 to 10 days of a contingency operation are the time of greatest need for RBC deglycerolization support to the theater, advance identification and training of in-theater BPD augmentation personnel is necessary. This will allow operation of the BPDs during the critical first 7 to 10 days, despite the expected delay in filling required organizational vacancies from the CONUS personnel support base. Possible sources of augmentees could be uncommitted U.S. personnel or host nation support personnel. An obvious need exists for advanced arrangements for these augmentees by memoranda of understanding, contract, or other formal agreement.

## 6-2. Frozen Blood Product Receipt and Storage

### WARNING

**Frozen blood products, dry ice, and the interior surfaces of the ultra-low freezers can cause frostbite to exposed skin. Cryoprotective mitts must be worn during the receipt and storage procedures.**

a. Determination of Acceptable Temperature. As soon as a shipment of frozen blood products is received, the units must be checked and placed at the correct storage temperature. Frozen RBCs should be received at  $-40^{\circ}\text{C}$  or colder. Appropriate temperatures can be maintained by using dry ice.

(1) Pelleted dry ice is the easiest means of maintaining adequate shipping temperatures for frozen RBCs. Since pelleted dry ice maintains a temperature of approximately  $-77^{\circ}\text{C}$  as it sublimates, units received with dry ice present should be at  $-40$  or colder.

(2) If the units were re-dry-iced during shipment, they may have been thawed out and refrozen by the second addition of dry ice. In order to be certain that the frozen RBCs remained frozen during shipment, observe each unit for an indentation per manufacturing facility instructions on or within the package. If there is no longer an indentation per manufacturing facility instructions, the units have thawed during shipment and are no longer acceptable.

(3) New dry ice should be added approximately every 48 hours. Add 30 pounds of dry ice to each box. This should provide a total of approximately 40 pounds of dry ice to each box. The final weight of each box should be about 55 pounds.

(4) FFP/PF24/Cryoprecipitate should be shipped with dry ice. At their destination, units should be received at -18 °C or colder. Frozen product shipments should be checked with a thermometer placed adjacent to a unit on top.

(5) If questions about the integrity of shipping temperatures arise, the receiving point of contact (POC) at the BPD will determine the acceptability of the shipment. The POC should consider the condition of the units, the results of unit indentation checks, and the documentation of re-dry-icing annotated on the box.

b. Documentation of Receipt. Each frozen blood product shipment will be accompanied by a shipping document (DD Form 573 or equivalent). BPD personnel should complete the receiver portion of the document. The original form should be filed at the BPD. The second copy is sent back to the shipper. The BPD must annotate units received damaged or out of temperature as “unacceptable” on the shipping document and ensure notification of the shipper. Shipping problems must be resolved promptly.

c. Frozen Blood Product Storage and Inventory Tracking.

(1) Purpose. Each BPD must have an efficient means of both storing units and tracking their exact locations within the facility's freezer array. If the BPD performs glycerolization of RBCs, follow instructions in ASBP blood program letter (BPL) 04-02, ASBP Frozen Blood Replacement Plan, for management of frozen blood cryogenic plasma samples. This management is necessitated by upgrades in infectious disease testing technology, donor unit retrievals, and lookback investigations.

(2) Temporary Storage. When a shipment of frozen blood arrives at the BPD for storage, the staff must check for adequate shipping storage temperature. (See para 6-2a.) The staff must then efficiently get the units into the freezers. If sufficient time is not available to perform the steps needed to account for units by numbers and bundle, then the entire box (including dry ice and shipping documents) should be placed in a freezer until time is available. Six boxes will fit into each 500 to 700 unit ultra-low (chest-type) freezer.

(3) Storage Tasks. Frozen RBC storage involves the following steps:

(a) Assessing proper -40 °C or colder shipment temperature. (See para 6-2a).

(b) Cross-checking received units against the units listed on the shipping document for each box received.

(4) Frozen Blood Inventory Tracking. DBSS and Theater DBSS will be utilized to the greatest extent possible as the system of record for management of all blood products within the BPD.

(5) Storage Temperatures. Freezers must keep frozen RBCs at a minimum of -65 °C or colder. A colder set temperature (e.g., -75 °C) and a warm alarm set

point (e.g., -70 °C) are desirable to afford a reasonable reaction time for freezer failures. The minimum plasma storage temperature is -18 °C or colder, but -30 °C or colder is desirable. For the purpose of flexibility and simplicity at BPDs, storage of all frozen products (including FFP, PF24, and cryoprecipitate) at a minimum of -65 °C is prudent.

### **6-3. Frozen Red Blood Cell Thawing and Deglycerolization**

a. Procedures. BPDs should follow SOPs prescribed by Service BPO for the preparation, storage, shipment, quality control, thawing, and deglycerolization of frozen RBCs.

b. Deglycerolization Supply Planning Factors. Although the Service SOPs identify all the equipment and supplies required to operate the technical aspects of the BPD, the specific supplies required for deglycerolization are of particular concern. These supplies may not be available in the quantities needed to operate a BPD during the intense stages of a contingency operation. The following planning factors will assist BPDs in rapidly calculating deglycerolization supply requirements. One of the most important blood supply planning factors is how many cases (or other unit of issue) of each supply item are needed to deglycerolize a specific number of frozen RBC units. Perform this calculation as follows.

(1) Formula. (Number of units to deglycerolize) x (case per unit factor (from table 6-1)) = number of cases required.

(2) Example. 80 (units to deglycerolize) x 0.05 (factor for cell wash bowl set (from table 6-1)) = 4 packages required.

c. Wartime /Contingency Operations.

(1) Optimal Deglycerolization Rate. The maximum reasonable rate at which the average technician can thaw and deglycerolize frozen RBCs is approximately 36 units per 12 hours, using four Haemonetics™ Model 215 cell washers. Untrained technicians will require hands-on experience before they will be able to function at this rate. From the standpoint of cell washers, each Haemonetics™ Model 215 should be able to wash one unit per hour (it will take two hours to obtain the first two units due to initial setup).

(2) Quality Control Procedures. Quality control procedures for wartime/contingency RBC deglycerolization are austere, but adequate to maintain a safe, final product. The following checks are the minimum recommended quality control program elements:

(a) Temperature monitoring: freezers (-65 °C or colder); refrigerators (1 to 6 °C); water baths (37 to 42 °C); frozen blood product shipments (maintain frozen state).



(b) Amount of 0.9 percent NaCl/0.2 percent glucose used for washing: at least 1500 mL is required.

(c) Final wash solution supernatant hemoglobin estimate using Haemonetics™ plastic color comparator: should read three (3) or less.

(3) Other Procedures. During wartime/contingency operations, other quality control measures should be added incrementally, as time and other resources permit.

#### **6-4. Preparation of Frozen/Thawed Blood Products for Shipment**

a. Frozen Products. For the shipment of frozen products to MTFs or naval vessels equipped with frozen blood storage capability, the procedures identified in Chapter 2 apply. Occasionally, it may be appropriate to send frozen plasma on wet ice during periods of intense combat blood support. In this case, the plasma is expected to be transfused within 24 hours.

b. Thawed /Deglycerolized RBCs. Cells washed with the Haemonetics™ Model 215 will have approximately a 50 percent hematocrit, resuspended in AS-3. Deglycerolized RBCs at 1 to 6 °C expire 14 days after thawing if the closed system integrity has not been compromised. Deglycerolized units are shipped on wet ice, as indicated in chapter 2.

**Table 6-1. Blood Supply Planning Factors**

Item: Cell wash bowl set (with waste bag), Haemonetics™ Model 215

Unit of issue: Case

Number of sets per case: 20

Wartime planning factor. 1 unit washed per bowl set

Units washed per case: 20

Cases per unit: 0.05

Item: Diluting solution, frozen blood, 12 percent sodium chloride (150 ml/bag)

Unit of issue: Case

Number of bags per case: 36

Wartime planning factor. 1 unit washed per bag

Units washed per case: 36

Cases per unit: 0.0278

Item: Washing solution, frozen blood, 0.9 percent NaCl / 0.2 percent glucose (2 L)

Unit of issue: Case

Number of bags per case: 6

Wartime planning factor. 1 unit washed per bag

Units washed per case: 6

Cases per unit: 0.1667

Item: AS-3 preservative solution (300 mL bag)

Unit of issue: Case

Number of bags per case: 20

Wartime planning factor: 1 unit prepared per bag

Units prepared per case: 20

Cases per unit: 0.05

Item: Sterile connecting device wafers (Haemonetics™ TCD model)

Unit of issue: Package

Number of wafers per package: 240

Wartime planning factor: 1 wafer per unit deglycerolized

Units prepared per package: 240

Packages per unit: 0.0042

Item: Sterile connecting device wafers (Terumo SCD model)

Unit of issue: Package (2 cassettes per package)

Number of wafers per package: 140

Wartime planning factor: 1 wafer per unit deglycerolized

Units prepared per package: 140

Packages per unit: 0.0071

## CHAPTER 7 DEPLOYABLE MEDICAL TREATMENT FACILITIES

### 7-1 General Instructions

MTFs are the end user of blood products within the COCOM AOR. MTFs receive blood products from BSDs, EBTCs, BPDs and other MTFs, store blood products, and prepare blood products for transfusion. Each Service has various levels of MTF capability for blood bank procedures and blood product usage.

### 7-2 Capabilities

Described below are the Service MTF capabilities for blood bank processes per current available doctrine.

a. Air Force MTFs. The Air Force provides medical treatment utilizing the Expeditionary Medical Support System (EMEDS). EMEDS is described in detail in AFTTP 3.42.71. The EMEDS is comprised of an EMEDS basic, EMEDS +10 and EMEDS +25.

(1) EMEDS Basic provides forward stabilization (Level II), primary care, force health protection, and preparation for aero-medical evacuation for a population at risk (PAR) of 1,500-3,000. EMEDS basic is capable of storing 30 units of Type O PRBC in a field blood refrigerator. Emergency collection capability exists if stored supply is exhausted. No blood bank testing is available.

(2) EMEDS+10 provides theater hospitalization (Level III) care in addition to the services offered by the EMEDS basic for a PAR of 3,000-5,000. EMEDS +10 is capable of ABO/Rh typing (no antibody identification capability or phenotype capability), crossmatching, storage of 30 Units PRBC (type specific), and storage/thawing of Frozen Plasma (FFP or PF24). Emergency collection capability exists if stored supply is exhausted.

(3) EMEDS+25 has the same services as the EMEDS +10 for an increased PAR of 5,000-6,500. Blood bank capabilities are the same as the EMEDS +10.

b. Army MTFs. Army MTFs with blood capability begin with Forward Resuscitative Care (Level II) at the Brigade Support Medical Company (BSMC), Area Support Medical Company (ASMC), and Forward Surgical Teams (FST). At the Theater Hospital (Level III) echelon, the Combat Support Hospital (CSH) provides more definitive care, including complex surgical procedures. Blood capabilities are listed below.

(1) The BSMC and ASMC are capable of storing Type O PRBC in a field blood refrigerator. Emergency collection capability exists if stored supply is exhausted. No blood bank testing is available.

(2) The FST is capable of storing up to 50 units of Type O PRBC in a field blood refrigerator. No blood bank testing is available.

(3) The CSH is capable of ABO/Rh typing (no antibody identification capability or phenotype capability), crossmatching, storage of up to 480 Units PRBC (type specific), and storage/thawing of Frozen Plasma (FFP or PF24) and cryoprecipitate. Emergency collection capability exists if stored supply is exhausted.

c. Navy and Marine MTFs. The Navy and Marines provide medical treatment both afloat and ashore. Forward resuscitative care (Level II) is performed ashore by Marine Forward Resuscitative Surgical System (FRSS) units and Navy Expeditionary Medical Units (EMU). Level II care afloat is provided by the Amphibious Assault Ships (LH-A and LH-D class). Theater Hospitalization (Level III) care is provided by the Navy Expeditionary Medical Facility (EMF), Hospital Ships (T-AH), and Fleet Hospitals. Blood capabilities are listed below.

(1) The FRSS is capable of storing Type O PRBC in a field blood refrigerator. Emergency collection capability exists if stored supply is exhausted. No blood bank testing is available.

(2) The EMU is capable of storing Type O PRBC in a field blood refrigerator. Emergency collection capability exists if stored supply is exhausted. No blood bank testing is available.

(3) Amphibious Assault Ships. These ships are capable of carrying up to 1,000 frozen products and 600 liquid products. The ship has the ability to store and process frozen RBCs, frozen plasma (FFP and PF24), and liquid PRBCs. Only Type O RBC (frozen or liquid) are carried. ABO/Rh typing and crossmatching are available. Emergency collection capability exists if stored supply is exhausted.

(4) The EMF ranges from 10-116 beds based on mission and can be configured for Level II or Level III care. The EMF is capable of ABO/Rh typing (no antibody identification capability or phenotype capability), crossmatching, storage of up to PRBC (type specific), and storage/thawing of Frozen Plasma (FFP or PF24) and cryoprecipitate. Specific requirements are established per mission. Emergency collection capability exists if stored supply is exhausted.

(5) Hospital Ships (T-AH). These ships are capable of carrying up to 3,000 frozen products and 1,000 liquid products. The ship has the ability to store and process frozen RBCs, frozen plasma (FFP and PF24), cryoprecipitate and liquid PRBCs. Type specific products are carried. ABO/Rh typing and crossmatching are available. Emergency collection capability exists if stored supply is exhausted.

(6) The Fleet Hospital is capable of ABO/Rh typing (no antibody identification capability or phenotype capability), crossmatching, storage of PRBC (type specific), and storage/thawing of Frozen Plasma (FFP or PF24) and cryoprecipitate. Specific

requirements are established per mission. Emergency collection capability exists if stored supply is exhausted.

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## **APPENDIX A REFERENCES**

### **A-1. Publications**

AFPD 44-1 Medical Operations, 01 September 1999, Department of the Air Force, Air Force Surgeon General (AFMOA)

DoDI 6480.4 (Department of Defense Instruction), Armed Services Blood Program (ASBP) Operational Procedures, 05 August 1996.

FM 4-02.70/NAVMED P-5120/AFMAN 41-111 AABB Standards for Blood Banks and Transfusion Services, current edition

TM 8-227-3/NAVMED P-5101/AFMAN 41-119 The Technical Manual of the American Association of Blood Banks, current edition.

Title 21, Code of Federal Regulations, Part 211 Current Good Manufacturing Practices, current edition. (This publication may be obtained from Judge Advocate General Offices at each command.)

Title 21, Code of Federal Regulations, Parts 600-799 Food and Drugs, current edition. (This publication may be obtained from Judge Advocate General Offices at each command.)

MIL-STD-6040, United States Message Text Format (USMTF), 31 March 2005, <https://disain.disa.mil/usmtf/>

NWP 4-02 (Navy Warfare Publication), Naval Expeditionary Health Service Support Afloat and Ashore, April 2005, Department of the Navy, Office of the CNO.

Joint Pub 4-02, Doctrine for Health Service Support in Joint Operations, 31 October 2006, The Chairman of the Joint Chiefs of Staff.

AFTTP 3-42.71, Expeditionary Medical Support (EMEDS), 27 July 2006, Department of the Air Force, HQ ACC/SGX.

FM 8-10-9, Combat Health Logistics in a Theater of Operations, 03 October 2005, Headquarters, Department of the Army.

FM 4-02.1, Combat Health Logistics, 28 September 2001, Headquarters, Department of the Army.

FM 4-02.25, Employment of Forward Surgical Teams, 28 March 2003, Headquarters, Department of the Army.

OPNAVINST 6530.4 Series, The Department of the Navy Blood Program, Chief of Naval Operations, Commandant of the Marine Corps.

BPL 04-02 ASBP Frozen Blood Replacement Plan, 19 November 2004

**A-2. Prescribed Forms**

DD Form 572 Blood Donation Record. (Prescribed in paras 2-2b, 2-3a.)

DD Form 573 Shipping Inventory of Blood Products. (Prescribed in paras 2-3a, d, h, 4-4e, 5-2d, 6-2b.)

**A-3. Referenced Forms**

DD Form 1348-6 DOD Single Line Item Requisition System Document

DD Form 1502 Frozen Medical Material Shipment (Perishable Keep Frozen)

DD Form 1502-1 (C) Tactical - Chilled Medical Material Shipment (Perishable Keep Chilled)

SF 518 Medical Record-Blood or Blood Component Transfusion



**APPENDIX B  
ARMED SERVICES WHOLE BLOOD PROCESSING LABORATORY STAFFING**

**B-1. Staffing Requirements**

Table B-1 outlines the staffing requirements for each activated ASWBPL. The maximum staffing is comprised of appropriate medical laboratory and administrative personnel from each of the three Services and is based on the projected volume of blood to be processed.

**B-2. Other Requirements**

All Army and Navy personnel will be assigned and billeted as per current ASWBPL memoranda of agreement. Expenses incident to the transfer of these personnel will be borne by their parent Services.

**Table B-1. Staff Requirements for ASWBPL-Peacetime and Contingency**

Service	Grade	Specialty Code	Personnel	Personnel
			Required in Peacetime	Required in Contingency
Air Force	04	43T3E	1	1
	03/04	43T3E		1
	E6	4T071	3	3
	E5	4T071	1	2
	E3/E4	4T051	-	2
	E5/E6	4AO71	-	1
	E5	2T051	-	1
Army	E7	68KM40	1	1
	E4	68KM10	3	5
	E3/E4	92AM10	-	3
Navy	E6	8506	1	1
	E4	8506	1	1
	E3/E4	8506	2	3
	E3/E4	0000	-	3
Total officer personnel			1	2
Total enlisted personnel			12	26

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**APPENDIX C**  
**TECHNICAL DATA ON SHIPPING CONTAINER AND 463L PALLET**

**C-1. Blood Shipment Container**

(Box, Whole Blood Shipping).

- a. Capacity: 21 whole blood units or 30 packed RBC units (filled).
- b. Quantity of wet, glistening cubed ice required: 14 pounds.
- c. Weight of container: 9.5 pounds; with blood and- ice:-44 pounds.
- d. Measurements of container in inches (approximate): exterior-18 long x 19 wide x 16 high; interior-15 long x 14 wide x 11 high.
- e. Blood tonnage: Number of full containers times 0.0225 short tons.
- f. Blood cube: Number of full containers times 3.2 cubic feet.

**C-2. 463L Pallet**

- a. Measurement: 108 x 88 x 4 inches.
- b. Pallet with cargo net: 354 pounds.
- c. Maximum loaded height: 96 inches.
- d. Maximum allowable weight: 8,000 pounds.
- e. Weight of pallet. with 120 full blood (packed RBCs) containers (3600 units): Approximately 5,400 pounds.
- f. Volume of pallet with 120 blood containers: 442 cubic feet.

**C-3. Frozen Product Pallet (FFP / PF24 / Cryoprecipitate)**

- a. Same as C-2 above for 120 boxes, except as noted in b and c below.
- b. Weight of container, frozen products and dry ice: 44 pounds.
- c. Full pallet equals: 1,800 units of FFP/PF24 with 15 units per container (1 unit FFP/PF24 per cardboard storage box); 3,600 units of cryoprecipitate with 30 units per container.

**C-4. Frozen Red Blood Cell Pallet**

Currently, with 12 units of RBCs per box and 20 pounds of dry ice, 1,440 units of frozen RBCs could be shipped on a 463L pallet using 120 of the current blood containers. Additional dry ice would have to be added frequently.

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## **APPENDIX D USE OF BLOOD REPORTS AND BLOOD SHIPMENT REPORTS**

### **D-1. Use of Reports**

a. The BLDSHIPREP provides a standardized message text format that is used worldwide in the ASBP to report blood shipments.

b. The BLDREP provides a standardized message text format that is used worldwide in the ASBP to report blood inventories, blood requests, blood expiration, and to project requirements.

### **D-2. Master Menu Codes**

The respective SBPO (CONUS), or JBPO (OCONUS), in lieu of standard nomenclature, may assign brevity codes for individual component/Service blood program elements. The BLDSHIPREP may be available in automated form for submission to all or some elements of the ASBP through DBSS or the Composite Health Care System. To help reduce the length of messages, a master menu (Table D-1) has been standardized for use in the BLDSHIPREP and BLDREP.

**Table D-1. Master Menu Codes**

<b>Category</b>	<b>Code</b>	<b>Definition</b>
MANAGEMENT	A	Joint Blood Program Office (JBPO)
	B	Area Joint Blood Program Office (AJBPO)
	C	Armed Services Whole Blood Processing Laboratory (ASWBPL)
	D	Blood Donor Center (BDC)
	E	Blood Products Depot (BPD)
	F	Expeditionary Blood Transshipment Center (EBTS)
	G	Blood Supply Detachment (BSD)
	H	Medical Treatment Facility (MTF)
	I	Naval Vessel (NV)
BLOOD PRODUCTS	J	Red Blood Cells
	K	Whole Blood
	L	Frozen Red Blood Cells
	M	Frozen Plasma (FFP or PF24)
	N	Platelets (Liquid or Frozen)
	O	Cryoprecipitate
	P	To be determined
BLOOD GROUPS	Q	Random Group and Type O, A, B
	R	Random Group and Type O, A
	S	Random Type O
	T	Random Type A
	U	Random Type B
	V	Random Type AB
TIME FRAME	W	Required within 12 hours
	X	Required within 24 hours
	Y	Required within 48 hours
MISCELLANEOUS	Z	Not applicable or see remarks

**D-3. BLDSHIPREP**

A completed BLDSHIPREP should include the following:

a. Heading of message: from and to addressees, information copy addressee(s), message classification, operation name, report identification, date/time of message, references to other messages and the following lines:

(1) Line 1, ASOFDTG: day-time zone of the blood shipment.

(2) Line 2, REPUNIT: name, designator code, activity brevity code of the reporting unit, location of unit.

(3) Line 3, 1SHIPD: blood products/codes/number of units shipped/total number of units shipped.

(4) Line 4, BLDSHIP: blood shipment or air-bill control number/aircraft flight number/estimated time of arrival.

(5) Line 5, POC: point of contact at shipping location (name, rank, phone number, location).

(6) Line 6, CLOSTEXT: additional comments such as when the blood will need re-icing.

(7) Line 7, DECL: message downgrading instructions. Required if classified.

b. Example of a completed BLDSHIPREP is as follows:

```

FM: CDR USAMEDDAC FT KNOX KY/HSLBB//
TO: ASWBPL MCGUIRE AFB NJ//
INFO: CDRUSAHSC FT SAM HOUSTON TX/MCHO-CL-R//
UNCLAS
OPER/DULL BRASS//
MSGIDBLDSHIPREP/FT KNOX BDC/101222ZJAN92//
REF/A/CDRUSAHSC/090300ZJAN92/-/NOTAL//
ASODTG/100001ZJAN92//
REPUNIT/CMBC/D/FT KNOX KY//
1SHIPD
/BP/OPOS/ONEG/APOS/ANEGBPOSBNEG/ABPOS/ABNEG/TOTAL//
/J/ 160/ 140/ 32/ 40/ 20/ 8/ 0/ 0/ 400//
/M/ 0/ 0/ 0/ 0/ 0/ 0/ 24/ 0/ 24//
BLDSHIP/AB 12134/DELTA32/101500ZJAN92/14//
POC/NEVARREZ/SSG/PRIPHN:DSN555-1212/-/FT KNOX KY/SEPHN:555-1213//
CLOSTEXTBLOOD NEEDS RE-ICED BY 130001ZJAN92/CMBC SHIPMENT N01//
    
```

#### **D-4. BLDREP**

A completed BLDREP should include the following:

a. Heading of message: from and to addressees, information copy addressee(s), message classification, operation name, report identification, date/time of message, reference to other messages and the following lines:

(1) Line 1, ASOFDTG: day-time zone of the BLDREP

(2) Line 2, REPUNIT: name, designator code, and activity brevity code of the reporting unit.

(3) Line 3, BLDINVT: Used to report the total number of each blood product on hand at the end of the report period. Provide the reporting unit code or name and activity code when reporting another blood program activity/unit. Total the blood products at the end of the reporting period.

(4) Line 4, BLDREQ: Used to report the total number of each blood product requested and time frame needed. Provide the reporting unit code or name and activity code when reporting another blood program activity/unit.

(5) Line 5, BLDREP: Used to report the estimate of the number of each blood product which will expire within the next 7 days.

(6) Line 6, BLDEST: Used to report the estimate of the total number of each blood product required for resupply within the next 7 days. Provide the reporting code or name and activity code when reporting another blood program activity/unit.

(7) Line 7, CLOSTEXT OR RMKS: Used to provide additional amplifying information if required.

(8) Line 8, DECL: Mandatory if the message is classified.

b. Examples of completed BLDREPs in GENTEXT format follow. An example of a spreadsheet format for reporting is at Figure D-1.

(1) FM: CDR 51ST MEDGP OSAN KOREBTS//  
TO: USFK SURGEON SEOUL KOR/KAJBPO// UNCLAs  
OPER/SMITH//  
MSGIDBLDREP/OSAN EBTS/1012221//  
REF/A/CDRUSFK/090300ZJAN92/-/NOTAIJ/  
ASOFDTG/ 100001ZJAN92//  
REPUNITBLUE1/F/OSAN KOR//  
BLDINVT/-/900JQ/60LS/60MV//  
RMKS/ONE WALK-IN REFRIGERATOR NEEDS REPAIR//

(2) FM: CDR 32ND MEDLOGBNBSU//  
TO: CDR JTF CHARLIE SURGEON/AJBPO//  
INFO: CDR 16MEDGRP/LOG//  
CONFIDENTIAL  
OPER/VALIANT ENTERPRIZE//  
MSGIDBLDREPBSU/1012221//  
REF/A/CDRUSACOM/090300ZJAN92/-/NOTAL//  
ASOFDTG/100001ZJAN92//  
REPUNIT/32ND MEDLOGBN/GBZ44327432//  
BLDINVT/-/300JQ/60MV//  
BLDEXP/-/15JQ//  
BLDEST/-/300JQ/30MV//  
RMKS/COLLECTED 12 UNITS WHOLE BLOOD FOR EMERGENCY  
DECLAS OADR



BLOOD REPORT										
Spreadsheet Example										
MTF					Date:					
<b>Red Blood Cells</b>										
Total Count < 7 days to exp	O+	O=	A+	A=	B+	B=	AB+	AB=	Total	
<b>Frozen Red Cells</b>										
	O+	O=	Total							
				Number of operational instruments: <input type="text"/>						
				Number of deglycerolization kits on hand: <input type="text"/>						
<b>Fresh Frozen Plasma</b>										
Total	O	A	B	AB	Total					
Quarantined										
<b>OTHER</b>										
Total	O	A	B	AB	Total					
Quarantined										
<b>Transfused Units</b>										
	O Pos	O Neg	A Pos	A Neg	B Pos	B Neg	AB Pos	AB Neg	Unknown	Total
RBC										
FFP										
PLT										
Total Count										
<b>Patient Data</b>										
UNIT #	EXP Date	Product ABC/Rh	Product Type	Transfusion Date	Patient's Name	FMP/SSN	Nationality	Patient's ABC/Rh	Sex	Note

Figure D-1 Spreadsheet Example of Blood Report (BLDREP)

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**GLOSSARY  
SECTION I  
ABBREVIATIONS**

**AABB** – formerly the American Association of Blood Banks  
**AFTTP**- Air Force Tactics, Techniques, and Procedures  
**AJBPO** - Area Joint Blood Program Office/ Officer  
**AMC** – Air Mobility Command  
**AOR**- Area of Responsibility  
**APOD** – Aerial Port of Debarkation  
**APS** - Aerial Port Squadron  
**AS-1** – Additive Solution 1  
**ASBP**- Armed Services Blood Program  
**ASBPO** - Armed Services Blood Program Office  
**ASD(HA)** - Assistant Secretary of Defense (Health Affairs)  
**ASMC**- Area Support Medical Company  
**ASWBPL** - Armed Services Whole Blood Processing Laboratory  
**BCT**- Brigade Combat Team  
**BDC** - Blood Donor Center  
**BLDSHIPREP** - Blood Shipment Report  
**BLDREP** - Blood Report  
**BPD** - Blood Product Depot  
**BPL**- Blood Program Letter  
**BPO**- Blood Program Office  
**BSD** - Blood Support Detachment  
**BSMC**- Brigade Support Medical Company  
**C** – Centigrade  
**CAP**- College of American Pathologists  
**CCLM** – Center for Clinical Laboratory Medicine  
**COCOM** – Combatant Command  
**CONUS** - Continental United States  
**CPD** – Citrate Phosphate Dextrose (anticoagulant)  
**CSH** – Combat Support Hospital  
**DBSS** - Defense Blood Standard System  
**DOD** - Department of Defense  
**DOS** - Days of Supply  
**EBTS** - Expeditionary Blood Transshipment System  
**EMEDS**- Expeditionary Medical Support System  
**EMF**- Expeditionary Medical Facility  
**EMU**- Expeditionary Medical Unit  
**FDA** - Food and Drug Administration  
**FFP** - Fresh Frozen Plasma  
**FRSS**- Forward Resuscitative Surgical System  
**FST**- Forward Surgical Team  
**HHC** – Headquarters and Headquarters Company  
**JBPO** - Joint Blood Program Office/Officer

**MEDBDE**- Medical Brigade  
**MEDCOM**- Medical Command  
**MEDLOGBN** - Medical Logistics Battalion  
**MTF** - Medical Treatment Facility  
**NCOIC** - Non-Commissioned Officer in Charge  
**OCONUS** - Outside the continental United States  
**ODRS**- Operational Data Reporting System  
**OPLANS** - Operation Plans  
**PAR** – Population at Risk  
**PF24**- Plasma Frozen within 24 hours of Phlebotomy  
**POC** - Point of Contact  
**PRBC**- Packed Red Blood Cells  
**RBC** - Red Blood Cell  
**SIPRNET**- Secret Internet Protocol Router Network  
**SBPO** - Service Blood Program Officer  
**SOP** - Standing Operating Procedure  
**TDBSS** – Theater Defense Blood Standard System  
**TRANSCOM** – Transportation Command  
**UTC** – Unit Type Code

**GLOSSARY  
SECTION II  
DEFINITIONS**

**AABB (formerly American Association of Blood Banks)** - A blood bank accrediting agency which establishes policy and standardizes blood bank procedures.

**Area Joint Blood Program Office (AJBPO)** - A Tri-Service staffed office responsible for overall blood product management in a specific geographic area within a unified command theater of operations.

**Armed Services Blood Program Office (ASBPO)** - A Tri-Service staffed DOD field operating agency responsible for ensuring implementation and coordination of ASD(HA)-established blood program policies and management of blood resources.

**Blood Product Codes** - Codes for blood products used in the message text format.

**Center for Clinical Laboratory Medicine (CCLM)**- A DOD laboratory agency which establishes policy and standardizes laboratory practices in accordance with federal guidelines.

**Cubed Wet Ice** - Ice that is in cubed form, not crushed, shaved or in blocks, and that is glistening wet or melting, not hard frozen.

**DD Form** - Forms used by DOD agencies and ordered through publication channels.

**Food and Drug Administration (FDA)** - Blood bank regulating and licensing agency which establishes regulations and requirements for use by blood banks involved in interstate commerce (shipping blood across State lines).

**Joint Blood Program Office (JBPO)** - A Tri-Service staffed office responsible for overall blood product management in unified command theater of operations.


**Pallet of Blood** - The amount of blood or blood products shipped on a 463L pallet. The pallet can hold up to 120 boxes which would equal 3600 units liquid blood (30 units per box), 1440 units frozen blood (12 units per box), 1440 units FFP (12 units per box), or 8,640 units of cryoprecipitate (72 units per box).

**Service Blood Program Officer (SBPO)** - The person responsible for coordination, direction, and management of that Service's blood program in peacetime, military contingencies, wartime, and national/natural disasters.

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