TM 8-227-11
NAVMED P-5123
AFI 44-118

TECHNICAL MANUAL

OPERATIONAL PROCEDURES FOR THE ARMED SERVICES BLOOD PROGRAM ELEMENTS

Approved for public release; distribution is unlimited

HEADQUARTERS, DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE
1 September 1995

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TECHNICAL MANUAL
NO.8-227-11
NAVY PUBLICATION
NAVMED P-5123
AIR FORCE INSTRUCTION
NO.44-118

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WASHINGTON, DC 1 September 1995

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*This manual supersedes TM 8-227-11/NAVMED P-5123/AFI 44-118, 16 August 1982.

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CHAPTER 1

INTRODUCTION

1-1. Purpose

a. The Armed Services Blood Program 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) Directive 6480.5.

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

(3) Describe the operations of the Blood Donor Centers (BDCs), the Armed Services Whole Blood Processing Laboratories (ASWBPLs), the Blood Transshipment Centers (BTCs), the Blood Supply Units (BSUs), and the Blood Product Depots (BPDs).

(4) Identify specific manpower requirements for ASWBPLs, BTCs, and BDCs.

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.

(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 local civilian blood banks as necessary.

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

(3) The BSUs are designated by the combatant commands to provide blood products within a given geographical area of a unified command.

(4) The BPDs are fixed facilities located in designated unified commands to store frozen blood products.

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 medical treatment facilities (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 Terms

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 thorough standardization of procedures in order to provide the safest blood products available. Military BDCs, ASWBPLs, BTCs, BSUs, and BPDs 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 8–70/NAVMED P–5120/AFMAN 41–111 and TM 8–227–3/NAVMED P–5101/AFM 41–119. (These publications are published by the American Association of Blood Banks (AABB) and represent minimal performance guidelines.) Additionally, they must follow guidance provided by the Office of the Assistant Secretary of Defense, the Joint Staff to unified commands, and the ASBPO.

CHAPTER 2

BLOOD DONOR CENTERS

2-1. General Instructions

a. Purpose. BDCs collect, process, and provide blood products for local or wider 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*) Proper medical care is given to all blood donors.

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

(*c*) Technical operation of the BDC is carried out by qualified personnel. Suggested BDC staffing is found in appendix B. Suggested supplies and equipment can be found in Table of Allowances (TA) 890.

(2) It is the BDCs' responsibility to—

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

(*b*) Operate in accordance with all regulatory guidelines. The regulatory agencies are: the Food and Drug Administration (FDA), the AABB, and the Clinical Laboratory Improvement Program (CLIP).

(*c*) Maintain and store all blood bank paper or electronic records indefinitely.

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

(*e*) Submit a quarterly DD Form 2555 (Blood Bank Operational Report) to the SBPO no later than the third week of the month. A 3.5–inch computer disk is the preferred medium.

(*f*) Deploy, utilize, and upgrade the Defense Blood Standard System (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

a. Blood drives shall be scheduled and conducted in order to maximize the military donor base under the Armed Services Blood Program. Other military BDCs shall be given preferential access to installation donors whenever the donor base is not maximized. Contingency BDCs shall activate at least twice yearly to maintain proficiency. At least 20 units of transfusable blood must be collected and shipped to the ASWBPL.

b. Complete a DD Form 572 (Blood Donation Record) 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 will be screened using donor criteria specified in FM 8–70/NAVMED P–5120/AFMAN 41–111 and in FDA guidance.

d. Blood will only be collected in stocklisted collection/dispensing bags containing CPDA–1 or CPD with additive solutions (e.g., AS–1). For group O units only, there shall be at least one empty satellite bag attached for potential freezing procedures. 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. Donor names of serologic positive/reactive blood will be annotated in a deferral roster.

2-3. Blood Shipment

a. BDCs will use standardized forms and operating instructions identified by their SBPO. Whenever possible, standardized 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 accreditating agency (e.g., the AABB).

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

c. Liquid red blood cells (RBCs) will be stored at a temperature of 1 to 6 degrees Centigrade (°C). Fresh frozen plasma (FFP) storage will be at less than −18 °C. Frozen RBC units storage will be at less than -65 °C. Refrigerators and freezers used for storage will have an audible alarm, emergency power source, and a temperature recording system.

d. BDCs will ship blood products using standard procedures and the DD Form 573 or comparable computer facsimile. Complete one form for each container in the shipment. The shipping facility will maintain one copy of the form 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, the "Collins Box," (national stock number (NSN) 8115–00–935–9761). Cover liquid blood products with 14 pounds or more of CUBED WET ice which is double bagged (bag NSN 8105–01–266–7411) and secured with electrical tie-down straps (NSN 5975–00–074–2072) to maintain temperatures of 1 to 10 °C. Up to 18 units of FFP or 72 units of cryoprecipitate may be packed in the Collins box. Cover FFP with 20 to 30 pounds or more of pelleted dry ice to maintain temperatures below −18 °C for 48 hours. Up to 16 frozen units may be packed in the Collin's box. Cover frozen blood products with 20 to 30 pounds or more of pelleted dry ice to maintain temperatures below −40 °C for 48 hours. A maximum of 18 frozen blood units can be packed in the frozen blood shipping container (FBSC) (NSN 8145–01–357–1551). This box replaces dry ice with eutectic (freezing liquid) to maintain temperatures below −40 °C for 48 hours.

f. Transportation arrangements should be made through the Transportation Management Office (TMO) to allow blood to be received at the ASWBPLs within 24 hours after shipment. Blood units shipped to an ASWBPL should be received no later than 5 days after they were collected.

g. The shipping BDC will notify the ASWBPL of the incoming shipment either by datafax, the telephone, or electronic mail. The shipment information should include the donor center's name, number of boxes in the shipment, date of arrival, carrier, and airbill number. Outbound shipping costs will be borne by the shipping BDC.

h. When the containers are received, the receiver will note 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 form or 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 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 concurred in by the providing Services in appendix C.

(*c*) Program, budget, and finance all costs of maintenance, air transportation of blood products, 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 Assistant Secretary of Defense for Health Affairs (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. Peacetime staffing of the active ASWBPLs will be nine personnel, three from each Service, as specified in appendix C. The Air Force shall appoint an officer in charge (OIC) who is specialty trained in blood banking and carries the 43T3E Air Force Specialty Code (AFSC).

(*b*) Specifically identify personnel designated to staff ASWBPL contingency positions, as specified in appendix C. 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 ASBPO will request activation of, and contingency manning for, each ASWBPL through the Air Force and Army Surgeons' General, and the Chief of Naval Operations (N93). The ASBPO will provide blood requests and supply coordination, shipment authorization, and technical guidance.

(5) Chief, Air Force Blood Program Office, HQ USAF/SGMR, will periodically review the TA 893–E, ASWBPL War Reserve Materials, to ensure a current and adequate supply for a two-pallet-per-day processing capability. The HQ USAF/SGMR, in conjunction with the Departments of the Army and the Navy, will establish and update the ASWBPL staffing table in appendix C.

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 the commanders of unified commands, 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 Armed Services Blood Program as needed.

c. The ASWBPLs will provide necessary data and operational reports as designated by the ASBPO, with copies to the 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 requirements 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.

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 unified command locations will be arranged through the Tactical Air Control Center at Scott Air Force Base (AFB) and may require unified command 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 D. 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 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 prepositioning.

CHAPTER 4

BLOOD TRANSSHIPMENT CENTERS

4-1. General Instructions

a. Purpose. The BTC is managed by the Air Force at primary airports within the theater of operations as approved by the unified command. The BTC functions as an intermediate receiving, inspecting, re-icing, storing, and distributing facility for liquid and frozen blood products sent from the CONUS ASWBPLs, the theater BPDs or from another BTC, to the BSUs, another BTC or MTFs when required. BTCs provide daily blood reports (BLDREPs) to their respective Area Joint Blood Program Office (AJBPO) or Joint Blood Program Office (JBPO). The overall objective is to standardize BTC operations worldwide.

b. Responsibilities.

(1) The Secretary of the Air Force will establish BTCs at air terminals located outside the continental United States (OCONUS) upon request of the ASBPO or unified commanders to the Air Force Surgeon General. The determination of numbers and locations of BTCs will be in coordination with the unified command JBPO, the Joint Staff, and the 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 to operate the BTCs. (See app E.) Exercises will be conducted at least annually to ensure personnel are familiar with administrative and operational procedures. The Air Force SBPO has developed a CD–ROM based training tool (Blood Transshipment Center Training Program, July 1994, v.1.0) for each BTC position. It is available from the Air Force Surgeon General's Office, Medical Readiness Division (HQ USAF/SGMR), 170 Luke Avenue, Suite 400, Bolling AFB, DC 20332–5113.

(3) The BTCs will be responsible to the theater commander's blood program through the unified command JBPO. They will be activated only during contingencies, emergencies, and exercises, and will be operational within 24 hours of an activation order by the theater JBPO through command channels. The theater JBPO will provide coordination and technical guidance for the BTCs. Each BTC will have the capability to simultaneously store two 463L pallets (240 boxes or 7,200 units of liquid RBCs). Alternately, the BTC may store one 463L pallet of liquid RBCs plus one 463L pallet of either frozen RBCs (up to approximately 1,560 units) or FFP (approximately 1,440 units).

4-2. Blood Receipt

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

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, unload the pallet and remove the cargo net and any cover.

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, one of each of the 20 liquid red cell boxes should be inspected for proper temperature (1 to 10 °C) and unit appearance and then all boxes either 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 and frozen red cells should be taken out of their boxes and stored in ultra low-temperature freezers (less than −80 °C). Any left over dry ice should be collected in blood boxes, taped closed, and placed in walk-in 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, outside 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 theater JBPO will identify shipping requirements to the BTCs.

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. MTFs will obtain or transport blood product shipments from the BTCs as instructed by the theater JBPO. The BTCs will send shipment information to the receiving locations via message format or as directed by the JBPO.

d. Although BTC setup may be varied to meet local conditions, the setup in figure 4–1 is recommended.

e. Figure 4–1 shows a recommended setup and sequence for work stations to complete the pallet build. The sequence is explained below.

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

(*a*) Open the blood shipment container by cutting the filament tape across the top of the box.

(*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*) Starting with box one and every 20th box thereafter, prepare the 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 the 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,

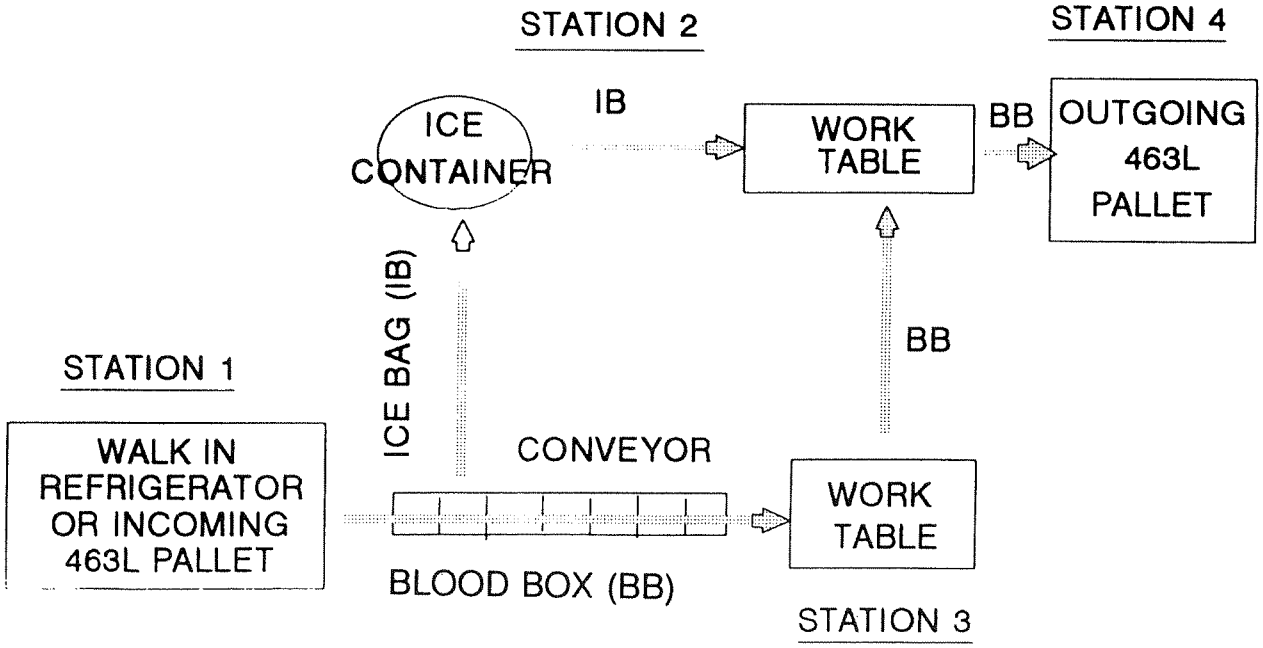

Figure 4–1. BTC Shipment and Pallet Preparation Setup

with the thermometer sandwiched between them. Return the sandwiched bags to the box.

(*e*) Remove the enclosed DD Form 573 from the packing list envelope (NSN 8105–00–985–7221). This envelope should be found taped to the bottom of one of the cardboard box flaps. Tape the DD Form 573 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. 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 tightly around the twist. Note: to save time during re-icing, the electrical ties can be pre-looped. Maintaining the twist, bend the twisted end down past the electrical tie and place another tie 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. If electrical ties are not available, filament tape may be used instead.

(*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*) Perform the following for the first box and every 20th box thereafter. Thermometers will be taken out of the boxes once the temperature has been checked. The DD Form 573 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 DD Form 573. 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 will be inspected for evidence of thawing. Frozen RBCs will be kept at −40 °C or less; FFP must be kept at −18 °C or less. Twenty pounds of dry ice per box is required. Add 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 DD Form 573 and brought to the attention of the non-commissioned officer in charge (NCOIC).

(*c*) The laboratory technician, in consultation with the NCOIC, will determine if any discrepancies warrant the inspection of more than 1 in 20 boxes. Major discrepancies in blood product suitability will require further inspection of all blood boxes in the shipment.

(*d*) The DD Forms 573 of all other boxes will only be noted with the date and time of re-icing and will not contain inspection results unless inspected.

(*e*) The *top* carbon copy of the DD Form 573, which is taped to the top of the styrofoam box, will be removed for the inventory control. If only one copy of the DD Form 573 is available, then document, on a locally-devised inventory form, the number and type of units in the box.

(*f*) Until the DD Form 573 is revised, rubber stamp or print on the reverse side of the last copy of the DD Form 573, "name," "date," "temp," and record data for each of these items.

(*g*) Place the DD Form 573 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. (See fig 4–2.)

WARNING

Use the step ladder to place blood boxes on vertical rows 3–6 to avoid muscle strain.

(*c*) Stored resources should be conserved by rotating the blood by date received or expiration date found on the DD Forms 573.

(*d*) Blood containers will normally contain a single blood group and type. This should be prominently noted on the outside of the shipment container. 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.

f. 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.

g. Personnel should assist other stations as required.

4–5. Communications

a. BTCs have requirements to communicate 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 Pubs 3–56.24, 4–02.1, and 6–04.20. (See app F.)

(1) *BLDREP.* BTCs, when activated, will submit a BLDREP by immediate message or encrypted transmission to their designated AJBPO or JBPO. The reporting period will be provided by the AJBPO/JBPO.

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

b. The BTCs should be equipped with communications equipment which will allow communication to designated units. Direct communication between the BTC 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.

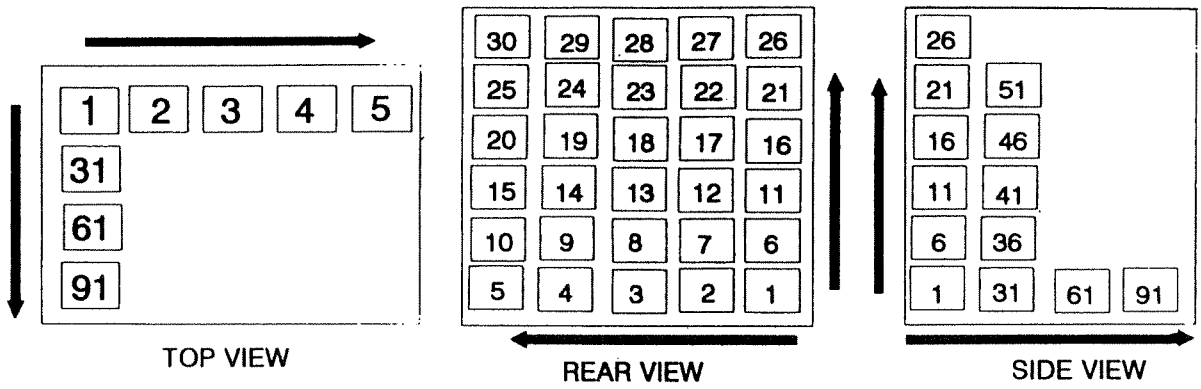

Figure 4–2. 463L Pallet Build Sequence

CHAPTER 5

BLOOD SUPPLY UNITS

5-1. General Instructions

a. Purpose. The BSU is an intermediate supply point in the distribution of blood between the BTC and the requestors for blood products. The BSU can usually support a maximum of 12 MTFs depending on the situation and may include forces afloat. A BSU mission is to collect (emergency only), receive, store, process, and distribute blood products to its supported MTFs within a defined geographical area. The BSU should have the capability of storing up to 5 days of supply (DOS) of blood products based on the usage rate of its supported MTFs. The BSUs will be established by the Services as designated by the unified commands. The determination of the numbers and locations will be in coordination with the unified command JBPO, the Joint Staff, and the ASBPO. A BSU may be fixed or mobile depending on the situation. This chapter provides basic procedures and responsibilities for a BSU. Figure 5–1 depicts the BSUs within the distribution system. Note that a BSU may support more than one Service's MTFs. However, due to the missions of the U.S. Marine Corps, their BSUs are Service-specific.

b. Responsibilities.

(1) The respective Services will—

(*a*) Establish BSUs within the unified commands at the request of the ASBPO or unified commander. The determination of numbers and locations of BSUs will be in coordination with the unified command JBPO, the Joint Staff, and the ASBPO. Funding for operations and maintenance is the responsibility of the respective BSU's Service.

(*b*) Identify, staff, and fund sufficient personnel to operate these BSUs. Annual exercises involving these personnel will be conducted to ensure familiarity with administrative and operational procedures.

(3) The BSUs will—

(*a*) Be responsible to the theater commander's blood program through the unified command JBPO or AJBPO. They will be activated and operational according to operation plans (OPLANS) and contingency plans. The theater JBPO will provide coordination and technical guidance for the BSUs.

(*b*) Have the capability to store up to 5 days of packed RBCs and FFP based on MTF usage rates up to one pallet of packed red cells (3600 units).

(*c*) Support a BPD if tasked by the unified command. A BPD is a fixed facility located in a unified command theater of operations which stores large amounts of frozen red cell units and FFP. The main purpose of manning a BPD would be to deglycerolize (wash) frozen red cell units. This setup could exist as a BPD/BSU simultaneously.

(*d*) Collect blood for emergency situations if so tasked. This usually is due to a requirement for platelets. Therefore, it is very important that any unit designated for this mission be manned, trained and supplied prior to assuming this mission.

c. Support.

(1) The Army Medical Department currently has assigned blood platoons in their Medical Logistics Battalions (MEDLOGBNs). These blood platoons are manned and equipped to perform the duties of a BSU. They have assigned to them a blood bank officer, trained and specialized in blood bank procedures and trained in BSU activities for both Service specific and joint missions. They have approximately 20 personnel required for each platoon. Most of these personnel are enlisted laboratory technicians trained in blood banking. They are mobile units and can support small and large scenarios.

(2) The U.S. Marine Corps has programmed fluids platoons within their Force Service Support Groups. They are mobilization units which could perform BSU activities for Marine only expeditionary forces.

(3) The Navy has specified ships which have blood banking capabilities to include frozen blood storage. In certain situations where the Navy is the primary force, the unified command may task a ship to act as the BSU until a medical supply base is operational on land with a capability for blood support.

(4) The Air Force has no specified units which are designated to provide BSU support. In certain situations a fixed Air Force hospital may be tasked to provide BSU support to smaller hospital units within close proximity. This may include other Services' hospitals. For example:

(*a*) An Air Force base in Europe with a designated fixed medical facility may become a major air evacuation point. Additional medical

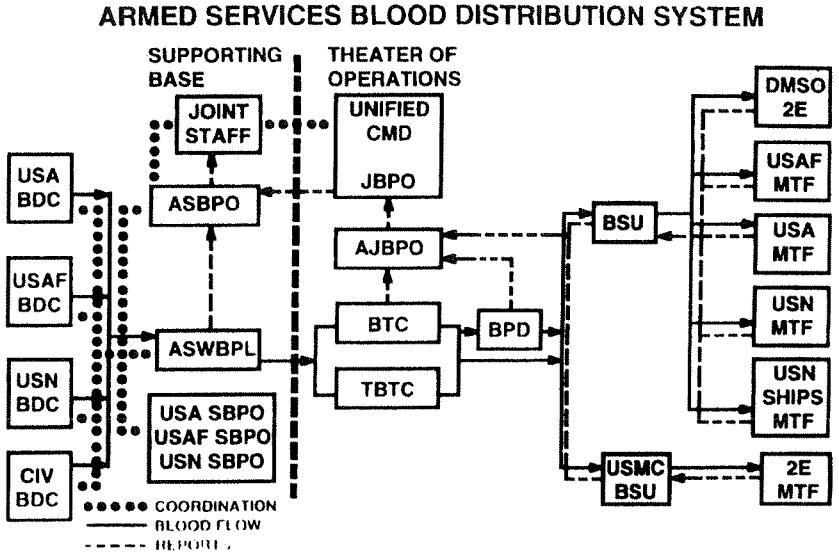

Figure 5–1. Blood Supply Unit in the Blood Distribution System

support to include air transportable hospitals (ATHs), and/or combat support hospitals may be deployed to this air head. The fixed facility may be tasked to be a BSU to support mobile hospitals within a certain geographical area. In certain OPLANS, this task may already be identified.

(*b*) Thus, the hospital can provide additional equipment and capabilities as well as training to perform their BSU mission. This may include additional ice making, frozen blood storage and deglycerolization, emergency blood collection, and FFP storage capabilities.

5–2. Blood Receipt, Storage, and Distribution

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

c. The BSU is responsible for receiving the blood from the BTC/BPD or the special handling unit at the air head. If the BSU 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 a BTC. (See chap 4.) However, at this level, inventory control can become more complex. Since a BSU is supporting medical units of varying types, the amounts and types of blood products will vary considerably. Second echelon medical units will require group O packed red cells only. This usually includes supporting the Division Medical Supply Office within Army divisions, forward surgical teams, and ATHs. Depending on hospital requirements, a hospital may require only one box of packed red cells with varying blood groups and types. Thus, the BSU may have to prepare totally new boxes of blood with new DD Forms 573.

e. Distribution of blood at the BSU level can vary. Some BSUs will not have the transportation assets to distribute blood to the hospitals. Thus, receiving hospitals will be required to provide their own means to pick up the blood from the BSU. Again, hospitals and the BSUs may set up routine pick up times to better accommodate the situation. Medical transportation, to include ground and air ambulances, are usually available to provide blood products. The AJBPO or JBPO can assist in transportation coordination. Some BSUs 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.

f. It is imperative that the BSU maintain close communication with the AJBPO, the BTC, and the supporting units. For distribution purposes, the BSU may want to have signature cards with supporting units to verify those personnel who can receive blood products.

5-3. Inventory Control

a. The BSU OIC or NCOIC is responsible for maintaining an adequate inventory of blood products to meet hospital requirements. A minimum of 5 DOS of blood should always be on hand at the BSU. A 5 DOS of blood should meet any 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 BLDREPs. For example, a BSU 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 BSU 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 BSU is acceptable and desirable as long as unit outdating does not become a problem. It can be expected that by the time a BSU receives packed red cells from the CONUS, there will probably be 3 to 4 weeks' shelflife left on the units. Therefore, BSUs 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 BSU has less or is expected to have less than 5 DOS of blood products, the OIC or NCOIC should notify the AJBPO/JBPO immediately in order to provide the BSU with an additional shipment of blood to meet supply requirements.

5-4. Communications

a. The BSUs have 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 Pubs 4-02.1, 6-04.20, 6-04.50, and 6-04.61.

b. The BSU will receive daily BLDREPs (see app F) from their supported hospitals. Initial coordination between the hospital and the BSU should be provided by the AJBPO or JBPO. However, it is good practice for the BSU to make direct coordination with their supported hospitals in order to ensure everyone is working in concert with given procedures.

c. The BSU 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 BSU as well as blood requested to maintain a 5-day supply of blood. Some AJBPOs may require the BSU to also show the inventories of the hospitals supported. For example, the BLDINVT line may be done as follows:

BLDINVT/32BSU/G/500JQ/50MT/10NT//
BLDINVT/11ATH/H/30JS//
BLDINVT/121EVAC/H/200JQ/25MT/4NT//

This sort of reporting at the BSU 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 BSU is supporting two facilities.

d. The BSU is usually not required to submit formal BLDSHIPREPs to the hospitals since it is usually the responsibility of the hospital to pick up their blood. However, if good communication is available, BSUs should be able to provide hospitals with shipping data to include anytime the BSU is relocating to include the new location as well as when to pick up blood products.

CHAPTER 6

BLOOD PRODUCT DEPOTS

6-1. General Instructions

a. Purpose. The BPDs have been established in certain unified commands to provide storage for frozen RBCs and FFP. Frozen platelets have not been licensed by the FDA. Once this product is licensed, it may also be stored in BPDs. The unified commands will designate Service components to establish and operate each BPD. The determination of the numbers and locations will be in coordination with the unified command 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 prepositioned, 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) Store frozen blood products for resupply of ships offshore.

(3) Prepare frozen blood products for distribution, either as frozen units (FFP or RBCs) or as deglycerolized RBC units.

(4) Issue blood and blood products to BSUs, as required.

(5) Serve collaterally as BSUs 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 unified commands 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 annual training 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 MEDLOGBNs. Other facilities operate using personnel detailed from BSUs or MTFs.

(2) Most BPDs are currently manned well below 100 percent strength in peacetime. Unfortunately, the first 7 to 10 days of a contingency operation are the time of greatest need for RBC deglycerolization support to the theater. Therefore, 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

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 blood products should be received at −40 °C or colder. Appropriate temperatures can be maintained by using either dry ice or eutectic panels (available with the FBSC).

(1) Dry ice is the easiest means of maintaining adequate shipping temperatures for frozen RBCs/FFP. Since dry ice maintains a temperature of approximately −77 °C as it sublimes, units received with dry ice present should be at −40 °C 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 at −40 °C or colder during shipment, some sort of cryo-temperature indicator device should be placed in each shipping box. The indicators should be expendable and should produce a visible change if the RBCs reached warmer than −40 °C.

(3) If units are being re-dry-iced and shipped to another destination, do not remove or handle the cryo-temperature indicator. New dry ice should be added approximately every 48 hours. Simply 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 should be shipped with dry ice. At their destination, units should be received at −18 °C or colder. FFP 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 appearance of the cryo-temperature indicator, 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 DD Form 573. BPD personnel should complete the bottom portion (receiver) of the DD Form 573. The original form should be filed at the BPD. The second copy is sent back to the shipper if units arrive at the BPD in a damaged condition or at an unacceptable temperature. The BPD must notify the shipper by annotating the DD 573 as "unacceptable." 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/freezing of RBCs, it must be able to track cryogenic serum vials by unit number. This tracking 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 6–2*a*.) 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 number and bundle them, the entire box (including dry ice and DD Form 573) 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 6–2*a*.)

(*b*) Cross-checking received units against the units listed on DD Form 573 for shipping box of frozen blood received.

(*c*) Preparing six-unit clusters of units.

(*d*) Annotating the DD Form 573 with the storage location for each cluster.

(*e*) Storing six-unit clusters in the freezer.

(4) *Cluster Storage.* As each six-unit cluster of frozen blood units is bundled together (using a material such as strapping tape), it should be placed into the freezer according to loading plan shown in figure 6–1. To avoid extended exposure to room temperature, each cluster should be placed into the ultra-low freezer as it is prepared and labeled. The plastic material used in the blood bags becomes extremely brittle at cold temperatures and must be handled with care.

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 storage procedure.

(5) *Frozen Blood Inventory Tracking.* The standard Frozen Blood Inventory System (FBIS), de-

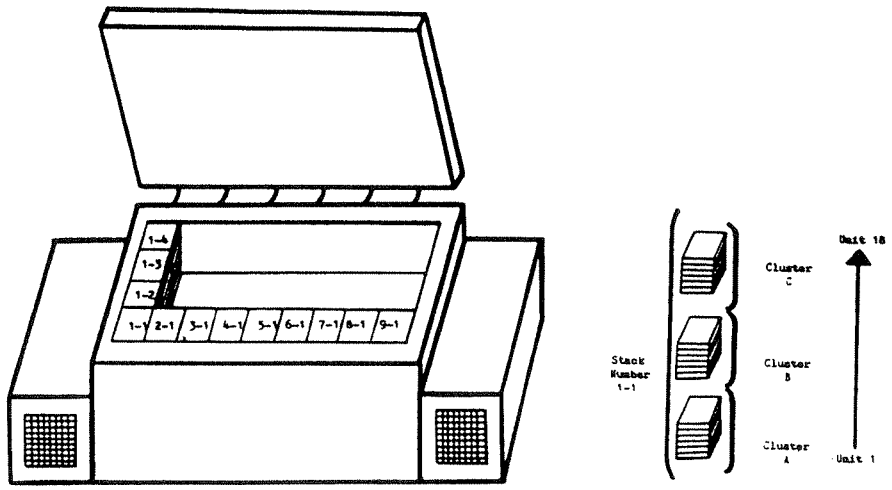

Figure 6–1. Freezer Loading Plan for Frozen Blood Unit Clusters

veloped by the U.S. Navy Blood Program, is a standard database program which tracks frozen blood and cryogenic serum vial placement for a BPD. The program runs on most Microsoft™ disk operating system (MS-DOS)-compatible computers possessing a hard drive. The FBIS has a password protection to reduce the risk of tampering. The BPD staff updates the FBIS with new unit storage information shortly after placing the inventory into the freezers. The use of the FBIS prevents endless searching through freezers in order to retrieve a specific unit or cryogenic vial from the freezer. Further information on the use of the FBIS is available in the SOP which accompanies the system.

(6) *Storage Temperatures.* Freezers must keep RBCs frozen at a minimum of −65 °C. 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, but −30 °C or colder is desirable. For the purpose of flexibility and simplicity at BPDs, storage of all frozen products (including FFP) at a minimum of −65 °C is prudent.

6–3. Frozen Red Blood Cell Thawing and Deglycerolization

a. Standardized SOP. The Naval Blood Research Laboratory (NBRL) has provided an SOP adopted by the DOD for the preparation, storage, shipment, quality control, thawing, and deglycerolization of RBCs. BPD staffs should pay special attention to the "EMERGENCY OR WARTIME USE ONLY" section of the deglycerolization procedure. This section explains the allowable modification to the procedure that can be implemented during contingency operations. This SOP can be used by BPDs without further supplementation. Updated copies can be requested from: Director, Naval Blood Research Laboratory, 615 Albany Street, Boston, MA 02118.

b. Deglycerolization Supply Planning Factors. Although the NBRL SOP identifies 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 packages of a 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) × (packages per unit factor (from table 6–1)) = number of packages required

(2) *Example.* 80 (units to deglycerolize) × 0.025 (factor for recovery pack (from table 6–1)) = 2 packages required

c. Wartime/Contingency Operations.

(1) *Optimal Deglycerolization Rate.* Based on several studies, the maximum reasonable rate at which the average technician can thaw and deglycerolize frozen RBCs is approximately 36 units per 12 hours, using three Haemonetics™ Model 115 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 115 should be able to wash one unit per hour.

(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 (RBCs: −40 °C or colder; plasma: −18 °C or colder).

(*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™ Comparator: should read less than the 150 percent level.

(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 115 will have approximately a 40 percent hematocrit, resuspended

in 0.9 percent NaCl/0.2 percent glucose solution. This supernatant wash solution needs to be removed prior to infusion. During wartime/contingency, BPD staffs must further prepare washed RBC units by spinning them down at 2982 x g for 4 minutes. The supernatant NaCl/glucose solution along with residual hemoglobin and some of the extracellular potassium should be expressed into the attached satellite bag. Enough red cells should be expressed into the tubing to make at least five integral segments for crossmatch. The bag containing the supernatant should then be removed and discarded. Deglycerolized RBCs at 1 to 6 °C (whether rejuvenated or not) expire 24 hours after washing. During wartime/contingency operations, the post-thaw expiration time may be extended to 72 hours. 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 115
NSN: 6640-01-302-5528
Unit of issue: PG
Number of bowls per package: 10
Wartime planning factor: 6 units washed per bowl
Units washed per package: 60
Packages per unit: 0.0167
Storage space per package: 15.5 x 9.5 x 9.75 inches
Acquisition code: L (local purchase)

Item: Recovery pack, RBC collection (quadpack)
NSN: 6640-01-320-1715
Unit of issue: PG
Number of boxes per package: 20
Wartime planning factor: 2 units washed per box
Units washed per package: 40
Packages per unit: 0.025
Storage space per package: 17 x 11.25 x 10 inches
Acquisition code: L (local purchase)

Item: Bag, centrifuge bowl (50 waste bags)
NSN: 6640-01-249-1181
Unit of issue: PG
Number of bags per package: 50
Wartime planning factor: 2 units washed per bag
Units washed per package: 150 (Each wash bowl set comes with its own waste bag. These additional bags are needed for the third through sixth units washed in a given bowl.)
Packages per unit: 0.0067
Storage space per package: 15.75 x 11.75 x 9 inches
Acquisition code: L (local purchase)

Item: Diluting solution, frozen blood, 12 percent sodium chloride (150 mL/bag)
NSN: 6505-01-234-8962
Unit of issue: PG
Number of bags per package: 36
Wartime planning factor: 2 units washed per bag
Units washed per package: 72
Packages per unit: 0.01389
Storage space per package: 15.5 x 9.5 x 9.75 inches
Acquisition code: L (local purchase)

Item: Washing solution, frozen blood, 0.9 percent NaCl/0.2 percent glucose (2 L)
NSN: 6505-01-240-4527
Unit of issue: PG
Number of bags per package: 6
Wartime planning factor: 1 unit washed per bag
Units washed per package: 6
Packages per unit: 0.1667
Storage space per package: 15.5 x 9.75 x 10 inches
Acquisition code: L (local purchase)

APPENDIX A

REFERENCES

A-1. Publications

AFPD 44-1
Medical Operations

Department of Defense Directive 6480.5
Military Blood Program

FM 8-70/NAVMED P-5120/AFMAN 41-111
Standards for Blood Banks and Transfusion Services

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

TM 8-227-3/NAVMED P-5101/AFM 41-119
The Technical Manual of the American Association of Blood Banks

Joint Pub 3-56.24
(C) Tactical Command and Control Planning Guidance and Procedures for Joint Operations—Joint Interface Operational Procedures—Message Text Format

Joint Pub 4-02.1
Health Service Support Logistics in Joint Operations

Joint Pub 6-04.20
U.S. Message Text Formatting Program Repository of USMTF Program Items for U.S. Implementation Guidance

Joint Pub 6-04.50
U.S. Message Text Formatting Program Keyword-out-of-Context (KWOC) Directory

Joint Pub 6-04.61
U.S. Message Text Formatting Program, Voice Message Standards (A-E)

A-2. Forms

DD Form 572
Blood Donation Record

DD Form 573
Shipping Inventory of Blood Products

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
Chilled Medical Material Shipment (Perishable—Keep Chilled)

DD Form 2555
Armed Services Blood Program Blood Bank Operational Report

SF 518
Medical Record—Blood or Blood Component Transfusion

APPENDIX B

RECOMMENDED BLOOD DONOR CENTER STAFFING

Personnel staffing of a BDC should be determined at the MTF level with the guidance of the SBPO. Factors such as fixed or mobile blood collection, physical characteristics of the blood collection/processing facilities, equipment, data management, and personnel availability must be considered. Workload projections for BDCs should be based on blood quotas and local requirements. Civilian employees may be used in lieu of the military specialties provided, but staffing may have to be increased because of overtime limitations. Suggested BDC staffing is contained in table B–1.

Table B–1. Suggested BDC staffing

Title	*Grade*	*Personnel required for number of units collected/processed per day*		
		50 units	*100 units*	*+100[1] units*
Blood bank officer	04	–	1	–
Blood bank officer	03	1	1	1
Medical lab NCO	E7	–	1	–
Medical lab NCO	E6	1	3	1
Medical lab NCO	E5	1	5	3
Medical lab specialist	E4/E3	6	9	5
Clerk typist	E4	2	3	1
Medical supply clerk	E4	1	1	–
Total personnel		12	24	11

Note:
[1] Add for each additional 100 units collected/processed per day.

APPENDIX C

ARMED SERVICES WHOLE BLOOD PROCESSING LABORATORY STAFFING

C-1. Staffing Requirements

Table C-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. Peacetime staffing of the active ASWBPL will be nine personnel.

C-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 C-1. Staffing requirements for an activated ASWBPL[1-4]

Service	*Grade*	*Specialty code*	*Personnel required in peacetime*	*Personnel required for number of units processed per day*		
				1000 units	*3600 units*	*7200 units*
Air Force	04	43T3E	1	1	1	1
	03/04	43T3E, IMA[5]	–	1	1	1
	E6	4T071	1	1	2	2
	E6	T4T071	–	1	1	1
	E5	4T071	1	2	2	2
	E3/E4	4T051	–	2	3	7
	E5/E6	4A071	–	1	2	2
	E3/E4	4A051	–	–	1	4
	E5	4A171	–	–	1	1
	E5	2T051	–	1	1	1
Army	E7	92B40	1	1	1	1
	E6	92B20	–	–	1	1
	E5	92B20	–	–	2	2
	E3/E4	92B10	2	4	5	9
	E3/E4	91B10	–	3	4	6
	E3/E4	71L10	–	–	1	1
Navy	E6	8506	1	1	2	2
	E4	8506	1	1	3	3
	E3/E4	8506	1	2	3	7
	E3/E4	0000	–	3	4	8
Total officer personnel			1	2	2	2
Total enlisted personnel			8	23	39	60

Notes:

[1] Requested ranks are to be filled by personnel with the designated rank or lower EXCEPT the designated positions E7 and E6.

[2] Due to physical labor and shift requirements, contingency augmentees must not be on profiles, but should be world-wide qualified.

[3] Since blood typing is a highly complex test, at least 60 percent of augmentee laboratory technicians should be CLIP qualified to perform highly complex testing.

[4] All E6 and above laboratory technicians and all administrative technicians should have documented, secret level security clearances available upon arrival at the ASWBPL.

[5] Individual Mobilization Augmentee.

APPENDIX D

TECHNICAL DATA ON SHIPPING CONTAINER AND 463L PALLET

D–1. Blood Shipment Container

(Box, Whole Blood Shipping (Collin's Box)).

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 × 19 wide × 16 high; interior—15 long × 14 wide × 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.

D–2. 463L Pallet

a. Measurement: 108 × 88 × 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.

D–3. Fresh Frozen Plasma Pallet

a. Same as D–2 above for 120 boxes, except as noted in b and c below.

b. Weight of container, FFP, and dry ice: 39 pounds.

c. Full pallet equals: 1,440 units of FFP with 12 units per container (@1 unit FFP per cardboard storage box); and 2,880 units of FFP with 24 units per container (@2 units FFP per cardboard storage box).

D–4. Frozen Red Blood Cell Pallet

Currently, with 13 units of RBCs per box and 20 pounds of dry ice, 1,560 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.