



The Center for Army Lessons Learned leads the Army Lessons Learned Program and delivers timely and relevant information to resolve gaps, enhance readiness, and inform modernization.



CONTACT US

10 Meade Ave.
Bldg 50
Fort Leavenworth
KS 66027

DSN: 552-9533
913-684-9533



Center for Army Lessons Learned

DIRECTOR

COL Scott Mueller

ANALYSTS/AUTHORS

Kraig Weaver
SFC Chase Chance

PUBLIC AFFAIRS OFFICER

Victor M. Guzman

INFORMATION DIVISION CHIEF

Eric Hillner

CHIEF EDITOR

Diana L. Keeler

EDITOR

Zack Shelby

ILLUSTRATOR

Jorge Sainz

SECURITY

Sandra Griffin

Center for Army Lessons Learned - Information

ARMY LESSONS LEARNED PROGRAM (ALLP)

ALLP provides the foundation for all Army organizations to maximize the benefit of experiential learning to change behavior and improve readiness. During fiscal year 2024, the Army will focus on the following:

- **CP Survivability**
 - CP Design & Mobility
 - Electro-Magnetic Spectrum Management
 - Deception
- **Allies & Partner**
 - Multi-National Interoperability (MNI)
 - Mission Partner Environment (MPE)
 - Security Force Assistance (SFA) & Cooperation
- **Decision Dominance**
 - Unified Network
 - Information Advantage
 - Data Analytics
- **Set the Theater**
 - APS, HNS, RSO&I
 - Networks
 - Authorities & Bi/Multi-Lateral Agreements
- **Integrated Air and Missile Defense**
 - Air and Missile Defense (AMD)
 - M-SHORAD Fielding
 - Counter-Unmanned Aerial System (cUAS)

JOINT LESSONS LEARNED INFORMATION SYSTEM (JLLIS)

Every Soldier is valued and can initiate change across our force by submitting an observation to JLLIS. ALLP makes lessons from today's Soldier into learning for tomorrow's Army. Register today and drive tomorrow's change at <https://www.jllis.mil>. (CAC login required)

CALL FOR PUBLICATIONS

Do you have a lessons or best practice to share with the Army and need assistance getting started? CALL has the resources to get you on the right path to getting published. Visit <https://armyeitaas.sharepoint-mil.us/teams/lessonslearned/SitePages/Writing-for-CALL.aspx> (CAC login required) and submit your article to CALL. Your publication could be on the next top-10 list!

REQUEST FOR INFORMATION (RFI)

CALL provides a unique service to the force providing the research and answers to a wide variety of topics and providing relevant products (if applicable) to support your inquiry. Submit your RFI at <https://forms.osi.apps.mil/r/Uh0WA8Vfik> (CAC login required) or email us at usarmyleavenworth.mccoe.mbx.call-rfi-manager-mailbox@army.mil.

REQUEST FOR PUBLICATIONS (RFP)

CALL has a library with thousands of articles and publications to support units and Soldiers in multiple scenarios from CTC and MCTP rotations, DSCA, to ongoing contingency operations. Submit your RFP at <https://armyeitaas.sharepoint-mil.us/teams/lessonslearned/SitePages/Request-for-Publications.aspx> (CAC login required) to submit your requests. NOTE: CALL publications have a three-year print life cycle.

BE AN AGENT FOR CHANGE – WORKING FOR CALL

Drive Army change and impact Soldiers as a CALL Military Analyst Forward at a COMPO 1 active division or corps headquarters! Highly motivated self-starters currently serving in the rank of KD-qualified major to colonel (04–06) or master sergeant to sergeant major (E8–E9) are encouraged to apply. Soldiers selected will serve as an essential link between the operational and institutional forces. To start the application process, go to <https://armyeitaas.sharepoint-mil.us/teams/lessonslearned/SitePages/Military-Analyst-Forward.aspx> (CAC login required).



FOREWORD

“... the officer who doesn’t know his communications and supply as well as his tactics is totally useless.”

- GEN George S. Patton, USA

TRADOC Pamphlet 525-8-2, The U.S. Army Learning Concept for Training and Education, states that “In the Army, learning is continuous.”

In support of this guiding principle, the Quartermaster School is proud to present this How-To Handbook that serves as a quick reference guide for Company Grade Officers and Junior Leaders. QM How-to Handbooks are an excellent resource that can be used in support of training across all three training domains (Institutional; Operational; Self Development).

The Army truly is a learning organization, and we must take advantage of every opportunity and means to train and educate our Soldiers and Leaders. Quartermaster Handbooks are an effective means as a combat multiplier for our force.

The contents of this handbook have been written and prepared by the professionals at the Quartermaster School and Army Sustainment University, U.S. Army Combined Arms Support Command (CASCOM), Fort Gregg-Adams, VA.

This Quartermaster How-to Handbook is one of several developed across all QM functional areas. Look for the other Quartermaster How-To Handbooks published on the CALL website.

A handwritten signature in black ink that reads "Michael B. Siegl".

MICHAEL B. SIEGL
BG, USA
57th Quartermaster General

PREFACE

This leader's handbook provides information on field services support in tactical austere environments. It focuses on field services support in large-scale combat operations, incorporating themes from Field Manual (FM) 3-0, *Operations* (1 October 2022) and FM 4-0, *Sustainment Operations* (31 July 2019). It also addresses the Army Health System's and Surgeon General's standards for hygiene on the battlefield. Army Techniques Publication (ATP) 4-42, *Materiel Management, Supply, and Field Services Operations* (2 November 2020) addresses force health protection regarding preventive medicine and veterinary services support field hygiene and sanitation regarding provision of field services. This handbook briefly discusses Army field hospitals, with a focus on internal shower and laundry (S&L) support missions for staff members and patients.

Leaders of quartermaster (QM) Soldiers will use this publication to guide them in supervising S&L operations. The principal audience for this leader's handbook is commanders and platoon leaders in composite supply companies, QM field services companies, and Army field hospitals. Commanders and platoon leaders should also refer to ATP 4-42 or FM 4-0 for more detailed guidance for field services doctrine for S&L operations in support of Army, joint, or multinational doctrine.

Logistics planners should include S&L as considerations in their planning. A QM company can be located as far forward as the supported brigade combat team (BCT). The goal is to provide a minimum of one shower and one change of clothing at least every seven days. The field services functions are critical to rebuild combat power, prepare for transition to offensive operations, and restore unit morale.

Commanders of military units are responsible for assuring sanitary control of facilities that fall under their command and restricting practices that present a high risk to a Soldier's health. Field S&L operations is an example of an activity requiring oversight by the command (Department of the Army Pamphlet [DA Pam] 40-11, *Army Public Health Program* [18 May 2020]).

The United States Army Quartermaster School is the proponent for this handbook. The Aerial Delivery and Field Services Department, Chief Field Services Division, is the preparing agency. Send comments and recommendations to Director, Aerial Delivery and Field Services Department, ATTN: Chief, Field Services Division, 710 Adams Ave, Bldg. 6025, Fort Gregg-Adams, VA, 23801; or submit by e-mail to: usarmy.gregg-adams.tradoc.list.qms-fsd@army.mil.

TABLE OF CONTENTS

Chapter 1	
Introduction to Shower and Laundry Operations	1
Chapter 2	
Duties and Responsibilities.....	3
Chapter 3	
Shower Capabilities	6
Chapter 4	
Laundry Capabilities	7
Chapter 5	
Shower And Laundry Equipment.....	9
Chapter 6	
Critical Operations	12
Chapter 7	
Planning for Shower and Laundry Operations.....	14
Chapter 8	
Shower and Laundry Safety Measures	19
Chapter 9	
Maintenance.....	21
Glossary.....	22
References.....	23

FIGURES

Figure 1-1. Organizational relationships.....	2
Figure 5-1. 12-head shower.....	9
Figure 5-2. LADS typical setup.....	10
Figure 5-3. Containerized Batch Laundry System.....	11



WRITE with CALL

Have a game-changing best practice or compelling story? Let CALL lead you to publishing success!

We recognize your insights' immense value and potential impact. CALL offers unmatched resources and expertise to showcase your ideas in respected military journals.

Our team helps you easily shape your narrative and navigate the publishing journey. Don't let your knowledge go unnoticed—become a published author with CALL's support.

CHAPTER 1

Introduction to Shower and Laundry Operations

Chapter 1 provides an overview of shower and laundry (S&L) operations across unified land operations. Quartermaster (QM) personnel provide these services in many units, primarily at the tactical and operational levels of logistics. The chapter concludes with a diagram on organizational relationships.

WARTIME TACTICAL SUPPORT

A composite supply company or a QM company (modular [M]) (components [COMPOs] 2 and 3 only) provides support to tactical-level commands and can send S&L teams as far forward as desired by the supported commander. A combination of composite supply companies, QM companies, host-nation support (HNS), and contractors provide support at the operational level.

The S&L teams may deploy separately and as far forward as the brigade support battalions (BSBs). There are six S&L teams in QM companies (M) (COMPOs 2 and 3). Each team can support 3,500 troops per week at 500 troops per day. The laundry service can clean 315,000 pounds of laundry at 15 pounds per Soldier per week. Each S&L team consists of one 12-head shower unit and one Laundry Advanced System (LADS). The laundry unit operates 20 hours per day. The shower unit operates 10 hours per day. The remaining operating time is for equipment maintenance.

PEACETIME SUPPORT

A composite supply company or QM company can support peacetime training, contingencies, humanitarian aid, or support and stability operations. Active, Reserve, and National Guard COMPOs; contractors; or HNS may provide support to S&L operations. Army regulations (ARs), standard operating procedures (SOPs), and HNS agreements will govern policies and procedures for procuring and using contracted services.

HUMANITARIAN ASSISTANCE AND DISASTER RELIEF

The U.S. military normally conducts humanitarian assistance/disaster relief missions in support of other United States Government (USG) departments or agencies to alleviate disaster victim suffering. Disaster victims and military personnel involved in relief operations often receive S&L support.

PURPOSE OF SHOWER AND LAUNDRY OPERATIONS

S&L operations provide command and control of personnel and equipment support in giving warm showers and laundry service to Soldiers in the field. The Surgeon General standard requires at least one shower per week for each Soldier to prevent diseases on the battlefield. The concept of individual “wash and return” laundry support allows each Soldier to turn in 15 pounds of personal laundry per week.

ORGANIZATIONAL RELATIONSHIPS

S&L support requires close coordination between individuals providing and receiving the support. S&L sections support their parent units and supporting units on an area support basis and as directed by higher headquarters. Operational relationships are critical when coordinating and managing mission requirements with supported units. Figure 1-1 depicts the relationships between higher headquarters and the S&L sections and between supported and supporting units. Although

the hospital center and field hospital have no command or reporting relationship with the other units, the concept of medical laundry support is also present in figure 1-1. The field hospital is a supported unit of the S&L section that coordinates with its higher headquarters to gain access to S&L support.

The composite supply company is assigned to a sustainment brigade, in support of the division, and to the theater sustainment command (TSC). The division sustainment support battalion (DSSB) has an organic composite supply company that supports units operating in the division support and consolidation areas. However, active COMPO composite supply company in COMPO 1 will be removing S&L capabilities by fiscal year (FY) 2025. The DSSB also supports the BSB in the brigade area. S&L sections can move forward to support brigade combat teams (BCTs) during mission staging operations that last at least 48 hours or in support of an established area of operation (AO). Modified table of organization and equipment (MTOE) and support capabilities for composite supply companies and QM companies (COMPO 2 and 3) are different. Leaders should reference capabilities documents while planning to ensure adequate personnel and equipment are available to support mission requirements. This is especially true in situations where one unit replaces another unit during a deployment or extended training mission.

The BCT generates requests for S&L support and sends them to the sustainment brigade. If the sustainment brigade cannot support the BCT, the TSC provides supplementary support with other available assets in the theater. The sustainment brigade supporting the BCT requiring the support generates requests for the supplementary support.

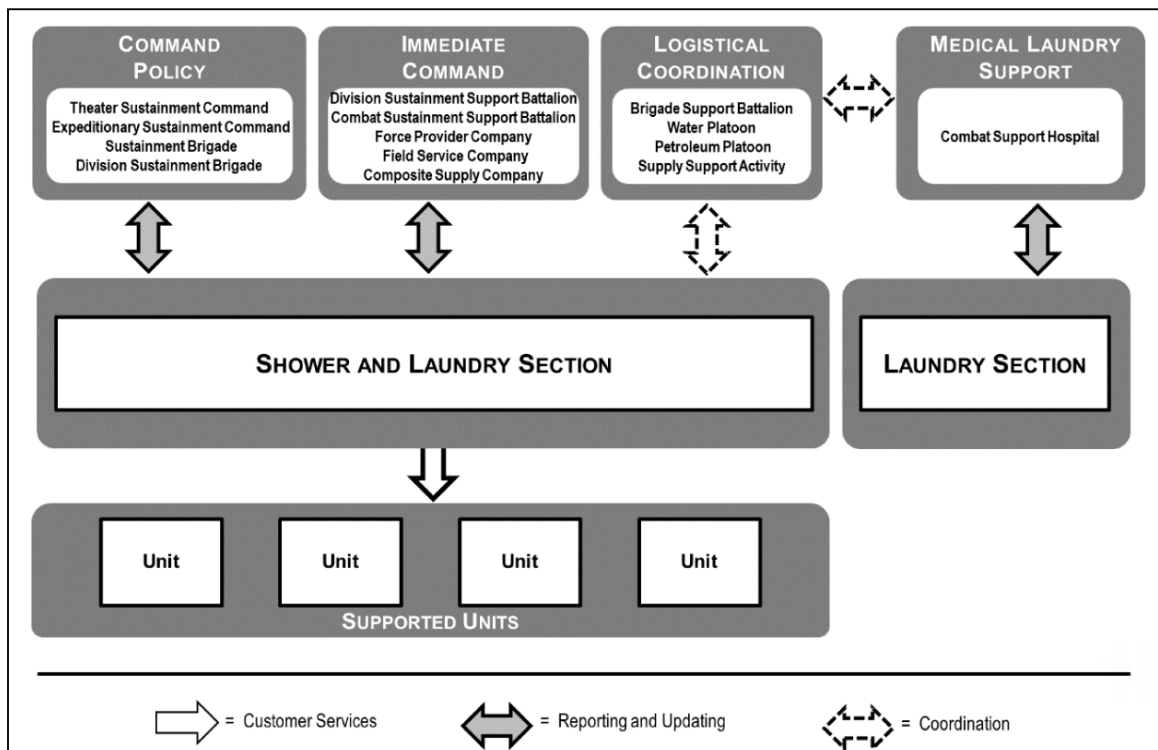


Figure 1-1. Organizational relationships¹

ENDNOTE

1. Army Techniques Publication (ATP) 4-42, *Material Management, Supply, and Field Services Operations* (2 November 2020), page 8-5, figure 8-1.

CHAPTER 2

Duties and Responsibilities

Chapter 2 covers the roles and responsibilities of the key players involved in the planning, operational, and sustainment of shower and laundry (S&L) operations (Army Techniques Publication [ATP] 4-42, *Materiel Management, Supply, and Field Services Operations* [2 November 2020], paragraph 8-36).

SUPPORT OPERATIONS OFFICER: BRIGADE AND BATTALION LEVEL

The sustainment brigade level, which executes planning, organizing, control, and direction, is where the responsibility for S&L functions begins. Brigade planning responsibilities include—

- Determine general area for site selection to ensure water, fuel, and gray water disposal is readily available.
- Arrange to have water tested by preventive medicine personnel or water treatment specialists.
- Notify supported units for assistance to set up tents or laundry equipment.
- Publish the source of supply for laundry supplies and fuel.
- Publish standard operating procedures (SOPs) that give requirements for records and reports.
- Incorporate the loading plans for the Laundry Advanced System (LADS) in the battalion loading plan.
- Coordinate with supported units and plan for the movement and defense of operating sites.
- Coordinate release times, communications, and possible succeeding missions for the laundry unit.

The sustainment brigade support operations (SPO) officer advises the commander on S&L support. The SPO briefs the command on the brigade's S&L capabilities to support units in a theater environment. The SPO at the brigade support battalion (BSB) advises the BSB commander on S&L support to the brigade combat team (BCT).

Supported-unit S-4. The supported unit S-4 requests S&L services. When requesting S&L support, the S-4 provides the following to inform supporting unit of requirements:

- Number of Soldiers supported for each service date.
- Proposed site location.
- Department of the Army (DA) Form 1687, *Notice of Delegation of Authority – Receipt for Supplies* (1 November 2015), signature cards for laundry pick up and turn in.
- Type of laundry turned in to units may be individual or organization.
- Individual personnel laundry turned in by unit supply sergeants using DA Form 2886, *Laundry List for Military Personnel* (1 February 1982) and organized on DA Form 3136, *Roster and Statement* (1 May 1966).

- Organizational and bulk consolidated laundry items organized by the supported unit supply noncommissioned officer (NCO) and itemized on DA Form 1974, *Laundry List (Medical Treatment Facility and Organization)* (1 June 1986).

QUARTERMASTER FIELD SERVICE COMPANY RESPONSIBILITIES

COMPANY COMMANDER

Company commanders verify that preventive medicine personnel or water treatment specialists test the water supply. They should evaluate operations, in part, by periodically inspecting the S&L equipment. Company commanders should ensure there are adequate amounts of S&L supplies.

PLATOON LEADER

Platoon leaders are responsible for the local security of the site for S&L operations. Security for S&L operations is primarily access control, as it is within a larger perimeter. Platoon leaders supervise preventive maintenance for laundry and shower equipment and supervise the establishment of S&L facilities. Platoon leaders are responsible for coordination and disposition of gray water drainage, and safety. Platoon leaders estimate platoon supply requirements and supervise receipt, storage, and issue of supplies and equipment. Platoon leaders are responsible for the accountability of assigned laundry and shower equipment, water storage equipment, and assigned vehicles. Platoon sergeants provide input on the site selection; however, platoon leaders make the final decision.

PLATOON SERGEANT

Platoon sergeants provide input for site selection for platoon operations and supervise site setup for S&L operations. Platoon sergeants coordinate and oversee the S&L section work by spot-checking operations and conducting routine inspections. Platoon sergeants assist platoon leaders with implementing the company plan for local security at the S&L site. Platoon sergeants supervise, monitor, and advise the chain of command on S&L operations. Platoon sergeants—

- Assist in site selection for platoon headquarters.
- Supervise site selection for platoon operations.
- Assist in preparing the S&L logistics status (LOGSTAT) report.
- Coordinate scheduling needs with supported units for platoon sections.
- Inspect S&L field sites.

SECTION CHIEF (STAFF SERGEANT)

Section chiefs supervise S&L equipment layout and setup, including the posting of signs to identify the different areas such as parking and signs to show traffic flow. Section chiefs supervise daily section operations, coordinate laundry schedules with supported units, and supervise equipment preventive maintenance. Section chiefs determine supply requirements by keeping records of supplies used during the S&L daily operations. Section team chiefs work under the supervision of the platoon sergeant. Section chiefs—

- Supervise the layout and setup of the S&L site, which includes advising on and conducting operational inspections; and ensure the section is complying with environmental standards directives from higher headquarters.
- Prepare and submit LOGSTAT reports as required to platoon sergeants or platoon leaders.

- Obtain materials for building storage bins and shelves as needed to expedite S&L operations.
- Coordinate with supported units' personnel.
- Coordinate with preventive medicine personnel to test water.
- Inspect sections' equipment and supervise daily preventive maintenance activities.

SHOWER AND LAUNDRY NCO/TEAM CHIEF

S&L noncommissioned officers (NCOs)/team chiefs manage the day-to-day S&L operations, including issuing daily laundry work orders. S&L NCOs perform the following tasks:

- Assist with selecting operating site.
- Supervise the layout and setup of the S&L site.
- Maintain load plans and supervise/assist with setting up S&L equipment.
- Enforce operational safety rules and precautionary measures, including executing environmental standards.
- Develop and distribute work schedules.
- Notify leadership on any problems regarding site operations.
- Determine laundry supply requirements and forward requests through supply support channels.
- Prepare, maintain, and submit required reports.
- Inspect sections' equipment and supervise daily preventive maintenance activities.
- Ensure laundered items return to appropriate personnel or organization within 48 hours.
- Ensure a separate shower schedule is set up for males and females.
- Obtain flooring materials for the building of duckboards or pallets for walkways and S&L tents.

SHOWER AND LAUNDRY SPECIALIST (PRIVATE OR SPECIALIST)

S&L specialists sort washable laundry from laundry that does not meet washing criteria. They review laundry lists for accuracy of contents for each Soldier's laundry bag. S&L specialists install, inspect, operate, and maintain mobile laundry and shower equipment (washers, dryers, and showers).

CHAPTER 3

Shower Capabilities

Chapter 3 provides an overview of shower and laundry (S&L) capabilities. It also covers S&L capability for the combatant commander and the methodology of processing personnel through the shower point.

SHOWER SERVICES

Each S&L team uses 12-head shower units for shower operations. 12-head shower units provide warm showers for a maximum of 500 Soldiers per day. The shower element may be set up at a fixed site or tactical location in a field environment. Sustained operations require a planning factor of 3K gallons per day of water. Coordination through appropriate command levels is crucial for an approved central drainage system to collect gray water. The shower point requires at least three shower personnel to operate.

UNIT SCHEDULES

To provide services in an orderly manner and coincide with supported units' availability, each supported unit receives a scheduled time for S&L operations. Complete scheduling for female and male Soldiers separately. Use a general schedule with separate hours for males and females if a unit schedule is not possible.

TRAFFIC FLOW

Soldiers using the shower will adhere to the following procedures:

- Supported unit personnel will provide guards to protect individuals' valuables, sensitive items, and weapons while Soldiers are showering.
- Soldiers will leave their helmets, uniforms, and boots in the changing area/tent.
- Soldiers enter the shower tent/area and may remain under the shower for up to seven minutes.
- After showering and disposing of one's soap, Soldiers return to the dressing area to dry off. Soldiers will then pick up their valuables, boots, helmet, etc.
- S&L personnel will keep a logbook to account for the number of Soldiers using showers and will report the number of Soldiers showered, water used, and fuel used each day to higher headquarters.
- If the command does not provide sundry packs, Soldiers are responsible for furnishing all their personal hygiene items.

CHAPTER 4

Laundry Capabilities

Chapter 4 covers laundry capabilities while on deployment or in support of a training exercise. It focuses on processing laundry bundles and leaders' priorities.

LAUNDRY

Individual laundry service is like commercial services. After washing and drying, the laundry element within shower and laundry (S&L) operations returns each Soldier's clothing. Use numbered mesh bags to identify each Soldier's laundry after returning it to Soldiers.

LAUNDRY PROCESSING PROCEDURES

When mission dictates, a unit representative is necessary to handle laundry turn-in and pick-up; those individuals will need a Department of the Army (DA) Form 1687, *Notice of Delegation of Authority – Receipt for Supplies* (1 November 2015) delegation document. The supported unit's supply noncommissioned officer (NCO) or designated representative normally executes this mission.

Laundry List for Military Personnel (DA Form 2886)

Use DA Form 2886, *Laundry List for Military Personnel* (1 February 1982) for processing individual laundry. The form contains three copies separated by carbon paper. Use as many copies as required by your unit's operation:

- The *first copy* is the bundle copy. Soldiers submitting their laundry fill in this copy. Soldiers should complete the heading, list the quantities of each item they want laundered, and put the copy with their laundry bag.
- The *second copy* is the patron's copy, kept by Soldiers who turn in the laundry items. This copy acts as a Soldier's receipt for the Soldier until the clean laundry is returned.
- At the time of this release, neither party uses the *third copy*.

DA Form 1974, *Laundry List (Medical Treatment Facility and Organization)* (1 June 1986) is for hospital laundry. See the hospital standard operating procedure (SOP) for processing procedures.

CHECKING AND MARKING LAUNDRY BUNDLES

Laundry NCOs supervise the verification that the quantity of bundles received is accurate. Checkers ensure items in Soldiers' individual laundry bags match the DA Form 2886 and ensure pockets are free of ammunition, pens, sharp objects, or anything that can cause injury to laundry personnel or damage laundry machines. For marking, place identified individual laundry items into numbered mesh bags. Detergent specifications/limitations of laundry equipment will result in the return of clothing turned in soaked in liquid detergent or containing powder detergent in the pockets.

PROCESS OF FINISHED LAUNDRY

Take clean laundry to the shipping area for pickup by the individual supported Soldier or designated unit representative. The U.S. Army Public Health Center (APHC) recommends scheduling receiving and reissuing operations at different times to avoid cross contamination between soiled and clean laundry. It is highly recommended to separate "receiving and shipping" tents/areas to avoid cross contamination by dirty laundry. Platoon leaders should develop contingency plans in case supported units relocate before laundry pickup.

CHAPTER 5**Shower And Laundry Equipment**

Chapter 5 describes specific shower and laundry (S&L) equipment and the critical equipment characteristics. This chapter informs leaders of critical elements for planning hygiene operations in austere environments.

12-HEAD SHOWER

The 12-head shower system (see figure 5-1) contains 12 individual shower stalls (six shower stalls combined). An AWH-400 water heater provides the heated water. Per U.S. Army Public Health Center (APHC), the optimum water temperature for 12-head shower is between 95° F (35° C) and 110° F (43.3° C) to kill highly resistant bacteria in austere conditions. Eliminate the buildup of sediment, scale, or biofilm on shower heads and faucets to help prevent the growth of Legionella bacteria.

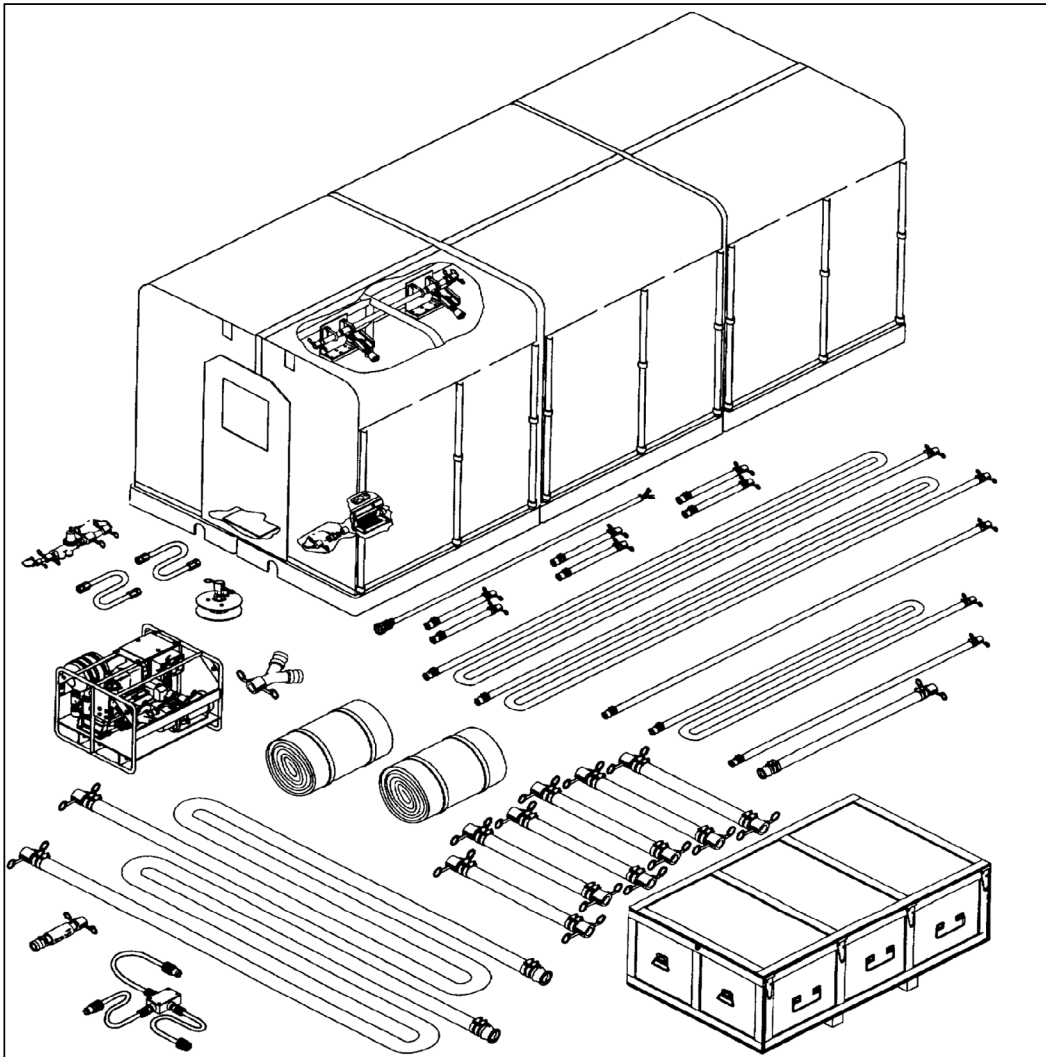


Figure 5-1. 12-head shower¹

LAUNDRY ADVANCED SYSTEM

The Laundry Advanced System (LADS) launders Soldiers' clothing in any environment and is capable of washing up to 400 pounds of laundry per hour up to a maximum of 20 hours per day. A distillation process recycles dirty wash water to recapture 90 percent of water used for laundry operations. LADS maintenance requires four hours per day. Each S&L team has one LADS capable of supporting 500 Soldiers per day (3,500 per week).

The LADS consists of two laundry drums and water-processing equipment within an 8'x8'x20' International Organization for Standardization (ISO) frame, a 400-gallon fuel tank, a 3K collapsible water tank, a storage container, and a generator mounted on an M871A3 trailer. The LADS washes individual laundry, extracts the water, and dries the laundry in the same drum (see figure 5-2).

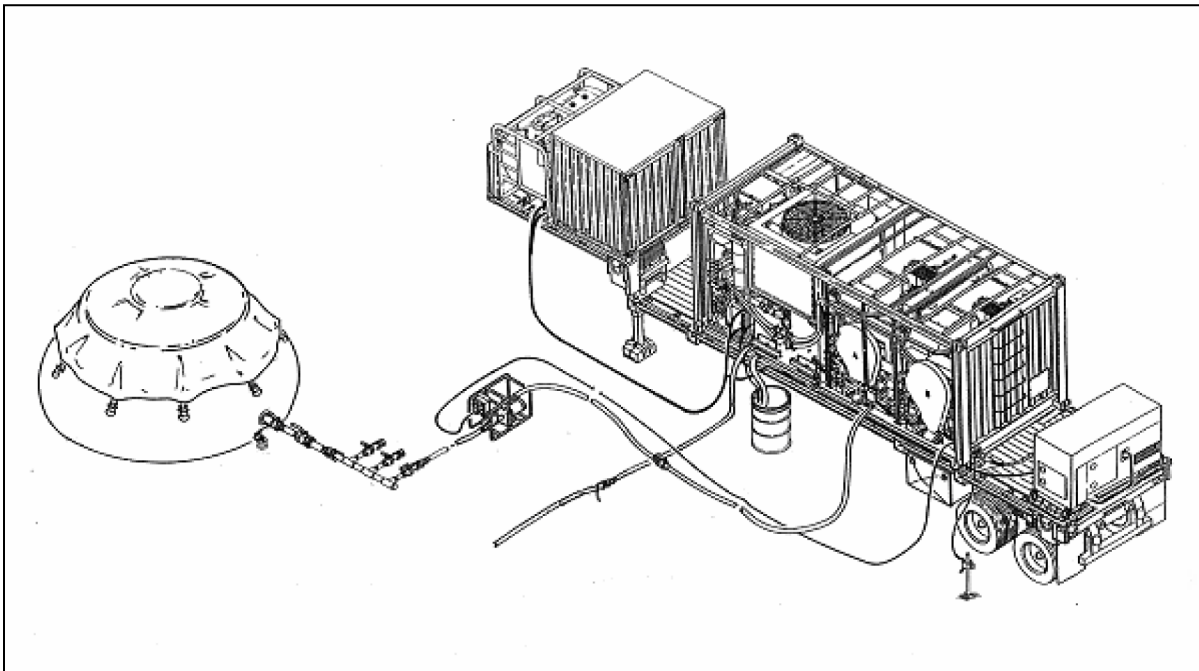


Figure 5-2. LADS typical setup²

CONTAINERIZED BATCH LAUNDRY

The Containerized Batch Laundry (CBL) is the laundry system normally assigned to an Army field hospital. The design of the CBL allows it to provide laundry services for direct patient-related linen for ambulatory patients and direct patient-care providers.

The CBL provides a capability to wash and dry 150 to 200 pounds of laundry per hour in an ISO frame containerized system. The water reuse system recovers more than 50 percent of the laundry wastewater. It can collect gray water and transfer it to an approved gray water source.

The CBL (see figure 5-3) consists of two commercial 50-pound washer/extractors and 75-pound dryers mounted in an 8'x8'x20' ISO container.

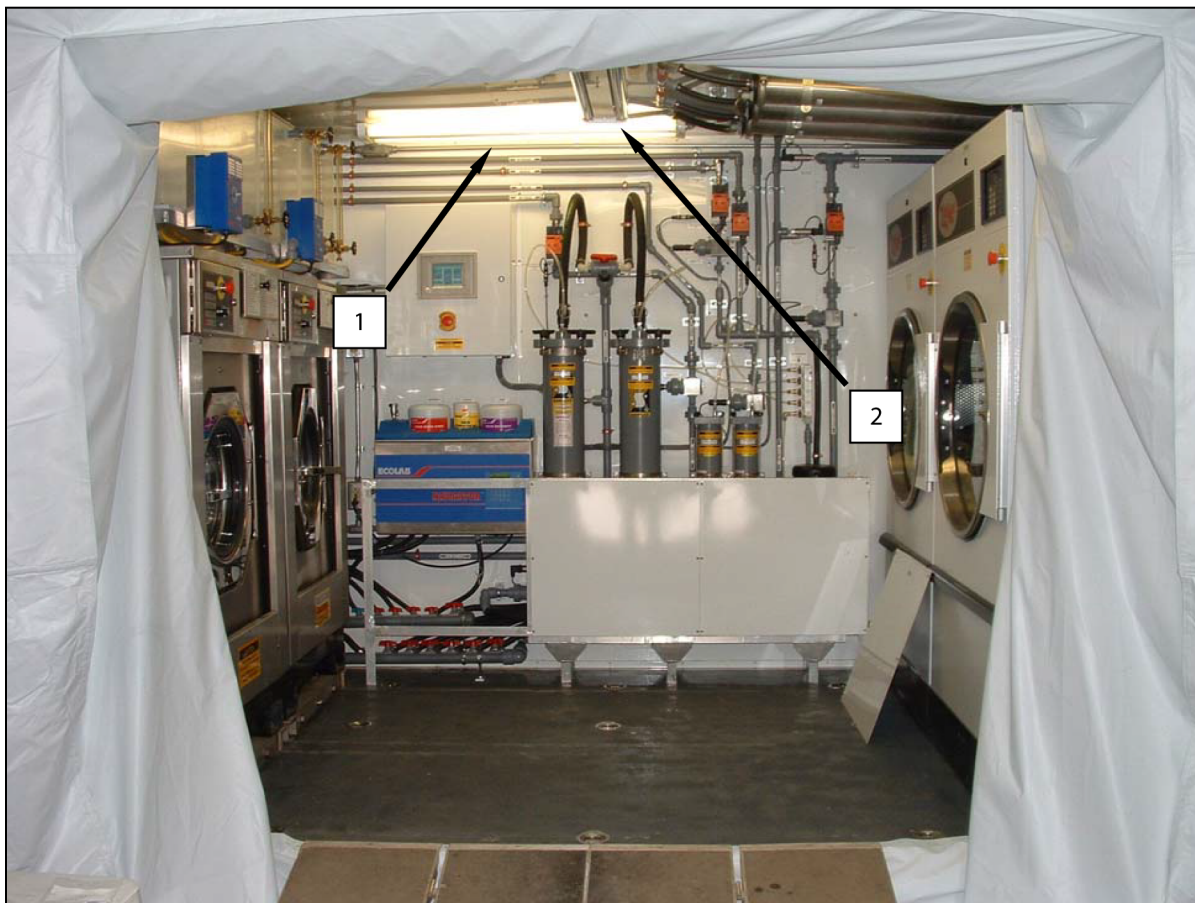


Figure 5-3. Containerized Batch Laundry System³

ENDNOTES

1. Technical Manual (TM)10-4510-207-13&P, *Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for 12-Head Shower System* (10 June 2013), WP 001-1, figure 1.

2. TM 10-3510-221-10, *Operator's Manual for Laundry Advanced System (LADS)* (7 July 2008), WP 0010-2.

3. TM 10-3510-226-10, *Operator's Maintenance Manual for Containerized Batch Laundry (CBL)* (31 August 2005), WP 0003-00.

CHAPTER 6

Critical Operations

Draining the Laundry Advanced System (LADS) to change dirty water, prevent over-night freezing, or in preparation for movement is crucial to preventing damage to the system. Failure to properly clean and flush anti-foam and detergent hand pumps can cause solution to harden inside pumps and tubing. This leads to pump and tubing damage and prevents the proper amount of anti-foam solution application during follow-on operations. Failure to flush water from pumps and tubing after cleaning can lead to freeze damage.

LADS COOLDOWN CYCLE

Perform a cooldown at the end of LADS operations in accordance with Technical Manual (TM) 10-3510-221-10, *Operator's Manual for Laundry Advanced System (LADS)* (7 July 2008), WP 17. Thermal fluid temperature must be below 150°F for the system to move on to shutdown procedures. Thermal fluid temperatures above 150°F, while not in laundry operations, causes damage to equipment and/or personnel. A normal cooldown lasts about 30 minutes.

LADS BOIL-OVERS

A boil-over is a catastrophic event that causes dirt to co-distill with the water and overflow the pre-filters and coalescer filters. Dirt particulates and condensed water travel to and overflow into the rinse 2 tank, thereby contaminating the system's "clean water." Therefore, clothes will finish the laundry cycle contaminated by dirty rinse water, causing the laundry to smell foul. The following four variables affect a boil-over:

- Detergent
- Heat
- Water level
- Anti-foam.

Currently there is no boil-over alarm mechanism. Most personnel are not aware there is a catastrophic problem with the LADS until there is an interruption in laundry production. The following are typical symptoms:

- **Filter replacement.** Replace the 5- or 10-micron prefilters more than once in three days. It is critical to address this issue immediately via the four factors discussed below. Failure to resolve a boil-over results in clogging of the LADS distillate plumbing and standpipe and foul-smelling laundry.
- **Detergent.** Residual detergent left in clothes is enough detergent to effectively wash a load of laundry in the LADS. Use the proper amount of detergent (one squirt per load). Excessive detergent in a wash cycle is normally the leading cause to a boil-over in the still. Excessive detergent leads to clogged prefilters, which eventually leads to clogged distillate plumbing.
- **Heat.** Often, "ambient" temperature is a factor in causing a boil-over. When the ambient temperatures exceed 100°F, consider positioning the LADS so direct sunlight is not on the back of the LADS during the hottest times of the day (afternoon sun from 1300 to 1600). The

solar load on the LADS still, despite insulation, adds heat and may contribute to a boil-over.

- **Water level.** Higher water levels in the still increase the probability for a boil-over. “Staggered cycles” run in the LADS software to help alleviate a potential boil-over. The system should always be clean; this allows the boiling rate to stay within normal range.
- **Anti-foam.** Ensure there is an adequate amount of anti-foam on hand at the start of laundry operations (one stroke of the pump delivers four ounces of the liquid). Adding too much anti-foam contributes to premature clogging of prefilters.

ELECTRICAL POWER

Disconnect electrical power before any electrical system maintenance to prevent electrical shock, injury, or death (electrocution). Only trained and qualified personnel may perform maintenance or attempt to correct electrical discrepancies on an electrical system.

WATER TREATMENT AND SYSTEM PRESERVATION

During deployments, take steps to ensure no biological growth occurs in the water treatment system or other components of the Containerized Batch Laundry (CBL). Failure to observe adequate precautions may result in water contamination, which could result in serious illness or death.

SYSTEM FLUSH

During a CBL shutdown for less than 24 hours, but greater than four hours, run a system flush. For periods less than four hours, there is no need to run any preservation cycles.

SODIUM BISULFITE PRESERVATION PROCEDURE

Preservation of nanofilter elements requires the use of sodium bisulfite during shutdown periods more than 24 hours while on missions. This prevents biological growth on the membrane surfaces. Failure to wear proper safety equipment may result in serious skin irritation, eye injury, or respiratory damage. If sodium bisulfite contacts the eyes or skin, flush with clean water and seek immediate medical attention. Use rubber gloves, face/eye protection and dust masks when handling sodium bisulfite. Relocate immediately to a well-ventilated area and seek immediate medical attention when inhalation of sodium bisulfite vapors occurs.

CHAPTER 7

Planning for Shower and Laundry Operations

Chapter 7 covers the planning phase of a mission. Leaders must consider all operational and mission variables that could potentially impact mission success. This chapter also provides information on anticipated support, including environmental, personnel, and preventive medicine requirements.

SITE PLANNING

Shower and laundry (S&L) teams may operate within secure fixed facilities in the joint security area, austere combat outposts, or joint service stations. When deployed, S&L teams provide showers and clean clothes to the supported unit from either a developed or an undeveloped location. A developed location will have an infrastructure (roads, buildings) and undeveloped location will lack that infrastructure. Safety, security, and natural terrain shape the S&L field layout. Mission requirements and environmental conditions often dictate site selection.

Analyze the site selection to determine if it is feasible to set up an S&L operation with concentration on the site criteria: water availability, terrain road network, wastewater management, cover, and concealment. Discuss criteria in detail. Platoons leaders, with assistance from platoon sergeants/laundry noncommissioned officers (NCOs), plan the pre-reconnaissance/reconnaissance of the projected area of operation (AO) within the supported units' concept of support sketch. The site selection depends on the mission. When possible, the site is located near the units or the supported command.

The following are ways to plan properly and ensure a successful mission:

- Identify the numbers of Soldiers who will be supported with S&L services and the amount of time they will be supported.
- Calculate the amount of equipment needed (12-head showers, Laundry Advanced System [LADS], or Containerized Batch Laundry [CBLs]) and consumables required.
- Ensure these items are available, serviceable, and ready for transport to the AO.
- Ensure proficiency through plan refinement, rehearsals, information collection, coordination, inspections, and movement.

ENVIRONMENTAL CONCERNS

S&L leaders identify environmental hazards during the site selection survey and report the potential of polluting the air, soil, and water, and degrading natural resources to higher headquarters.

Check with local authorities for regulatory requirements and comply with environmental standards applicable in the host country. The main environmental concern is wastewater disposal. Wastewater generated from S&L operations does not require specialized treatment before discharge.

Storage and movement of wastewater to an approved dumpsite or disposal using an approved sewage system may be appropriate in some situations. Before discharging any water on the ground, leaders should check with local environmental engineers. The proper use of detergents, bleaches, and other chemical supplies also mitigates environmental impact.

PREVENTIVE MEDICINE

Prevention of disease and nonbattle injuries (DNBIs). Preventive medicine services prevent casualties from DNBIs. Preventive medicine is the anticipation, prediction, identification, prevention, and control of communicable diseases (including vector, food, and waterborne diseases), illnesses, and injuries because of exposure to occupational and environmental health threats, including nonbattle injury threats, combat and operational stress reactions, and other threats to the health and readiness of military personnel and units. Preventive medicine services include on-site water quality analysis. Planners considering field services support should always include preventive medicine in their operational planning process.

Use potable water for showering because of exposure to cuts and scratches, incidental ingestion, and breathing of volatile or aerosolized material—all of which may allow contaminant entrance into the body. However, the use of disinfected water of less than drinking quality for showering is appropriate after a health risk assessment of the proposed water supply by preventive medicine personnel and the approval of the commander.

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR CONDITIONS

Plan for chemical, biological, radiological, and nuclear (CBRN) conditions. This includes an increase in requirements for nonpotable/potable water and chemical defense equipment. CBRN defense planning must include detailed procedures for equipment decontamination. There is no authorization for Soldiers and personnel to decontaminate through S&L equipment.

SHOWERS

Select the best possible area for shower operations according to the site layout provided by the supported unit, including verifying that preventive medicine personnel or water treatment specialist personnel have checked the water supply. Obtain information about the specific location and the area immediately around it (for example, road junctions, hills, bridges, and enemy positions/attack points if in theater).

PERSONNEL PLANNING FOR SHOWER OPERATIONS

The shower section consists of one crew (three personnel) to execute the shower mission. See the following guidelines:

- One NCO for supervision of the shower site.
- Two skill-level 1 personnel (E-1 through E-4) required to operate equipment, process personnel, and clean shower facilities.
- Using shower personnel for laundry operations after the completion of daily shower requirements is acceptable.

Platoon leaders should ensure there is adequate water available to conduct shower operations.

Planning factor in accordance with Army Techniques Publication (ATP) 4-42, *Material Management, Supply, and Field Services Operations* (2 November 2020) is 1,500 gallons per day for shower operations.

LADS: PERSONNEL PLANNING

The number of personnel required to support depends on the amount of laundry and number of LADS available. The LADS requires one crew unless operating 20-hour daily operations, which requires a minimum of two crews. The laundry receiving, bagging, unbagging, and shipping operations require additional personnel. These operations require at least one supervisor per shift and one laundry handling person for every 50 Soldiers' worth of laundry processed.

Determining the number of LADS required to support a mission is directly dependent on the laundry requirements. The LADS can process 7,500 pounds (500 Soldiers' worth at 15 pounds per soldier) of laundry in a 20-hour day if the laundry processes on a continuous basis using the "BDU 65 MIN" cycle. This equates to 18 cycles per drum with the average load of 28 bags, weighing 7.5 pounds each. In a field environment, it is more realistic to expect daily laundry outputs in the 5,000 pounds per day range. This considers several factors:

- Delays usually occur during laundry reception and bagging, causing idle time for LADS.
- Sometimes Soldiers turn in small loads of laundry, resulting in numbered mesh bags weighing as low as 2 or 3 pounds (instead of using max capacity at 7.5 pounds)
- The longer "BDU 70 MIN" or "BDU 75 MIN" cycles are necessary if the Soldiers' clothing is too soiled. This results in less than 18 cycles per day.
- To prevent falling behind, extra laundry requirements will exist the following day if the LADS is inoperable for any period during the current daily schedule.
- Expect downtime for corrective and preventative maintenance during missions in harsh environmental conditions.

To determine the number of LADS for a mission, use the following calculation:

$$\frac{\text{NOS} \times 15 \text{ pounds} \times \text{ULF} \times \text{SF} \times \text{EF}}{7,500 \text{ pounds}} = \text{Number of LADS required (round up to the nearest whole number)}$$

Where:

NOS = number of Soldiers serviced per day

ULF = under load factor 1+ percentage of laundry bags that weigh < 7.5 pounds

SF = soil factor 1 + 0 percent for lightly soiled, 7.5 percent for moderately soiled, or 15 percent for heavily soiled laundry

EF = environmental factor 1 + 25 percent if temperatures < 32°F or >100°F are expected + 25 percent for dusty conditions

Example 1:

$$325 \times 15 \text{ pounds} \times 1.25 \times 1.15 \times 1.25 / 7,500 \text{ pounds} = 1.17 \text{ LADS or } 2 \text{ LADS when rounded up}$$

Where:

NOS = 325 Soldiers

ULF = 1.25 for 25 percent of numbered mesh bags weighing less than 7.5 pounds

SF = 1.15 for heavily soiled laundry

EF = 1.25 for high temperatures

Example 2:

$$400 \times 15 \text{ pounds} \times 1.25 \times 1.00 \times 1.00 / 7,500 \text{ pounds} = 1.00 \text{ LADS}$$

Where:

NOS = 400 Soldiers

ULF = 1.25 for 25 percent of numbered mesh bags weighing less than 7.5 pounds

SF = 1.00 for lightly soiled laundry

EF = 1.00 for moderate temperatures

Example 3:

$$450 \times 15 \text{ pounds} \times 1.25 \times 1.15 \times 1.50 / 7,500 \text{ pounds} = 1.94 \text{ LADS or } 2 \text{ LADS when rounded up}$$

Where:

NOS = 450 Soldiers

ULF = 1.25 for 25 percent of numbered mesh bags weighing less than 7.5 pounds

SF = 1.15 for heavily soiled laundry

EF = 1.50 for high temperatures and dusty conditions

PERSONNEL PLANNING FOR CBL OPERATIONS

Ship the CBL with all the equipment necessary to operate in normal and adverse environments. There are two pack out configurations:

- **Full pack out.** Ships all supplied equipment within the CBL container.
- **Minimum pack out.** Ships designated items separately per Technical Manual (TM) 10-3510-226-10, *Operator's Maintenance Manual for Containerized Batch Laundry (CBL)* (31 August 2005) to meet container weight constraints.

Strictly followed pack out procedures are crucial to ensure all supplied equipment is present and allow for safe transport of the container. Failure to follow these procedures may prevent movement of the CBL and damage laundry equipment inside the container.

Do not pack corrosive laundry chemicals in the CBL. Temperatures inside the CBL during transport may exceed 120 °F (48.9 °C). Corrosive laundry chemicals stored at more than 120 °F (48.9 °C) may degrade and produce harmful gases. Failure to observe safety precautions may create a hazard resulting in serious injury or death to personnel and destroy internal metal components.

Do not pack fuel in the CBL. Temperatures inside the CBL during transport may exceed the flash point of JP-8, DF-1, or F-24 fuels. Failure to observe safety precautions may create an explosion or fire hazard resulting in serious injury or death.

DETAINEE SHOWER AND LAUNDRY OPERATIONS

When showering detainees, the use of disinfected nonpotable water (with at least one part per million free available chlorine) is appropriate unless schistosomiasis and/or leptospirosis are endemic and prevalent. Otherwise, potable water should be present. Detainees should have access to showers at least once per week. Detainees should only shower after all U.S. personnel have showered during daily operations. Thoroughly sanitize shower facilities per ATP 4-42 guidelines at the completion of detainee shower services. ATP 4-02.46, *Army Health System Support to Detainee Operations* (24 August 2021) (common access card [CAC] authorization required) provides more information regarding detainees.

Laundry detainee clothing at least once per week, preferably in an Army field laundry or a commercial central laundry facility. Wash detainee laundry separately and all systems are purged of water, cleaned, and sanitized before washing U.S. personnel clothing. When centralized laundry services are unavailable, there should be at least one clothes-washing station per 100 detainees. ATP 4-02.46 provides specific criteria for planning for detainee clothes washing, including water volumes and temperatures.

CHAPTER 8

Shower and Laundry Safety Measures

Leaders should instill a sense of safety awareness and every Soldier must watch for unsafe acts or conditions, make on-the-spot corrections, and report unsafe acts or conditions to a first-line supervisor. Shower and laundry (S&L) leaders should inspect work areas daily for safety hazards. Supervisors must enforce safety rules and all personnel must be aware of safety guidelines. All personnel should know and apply the following safety precautions when performing S&L operations:

- Always wear the appropriate personal protective equipment (PPE) for the job.
- All personnel should be familiar with the location and operation of fire extinguishers.
- Detergent, sanitizer, and anti-foam are irritants. Wear impermeable gloves and eye protection when handling or dispensing these items. Manufacturer safety data sheets should be available for all hazardous materials used in the maintenance and operation of S&L equipment. Enforce applicable precautions as specified in the safety data sheets for the handling, use, storage, and disposal of all materials. Failure to follow this warning may result in personal illness or injury.
- Exhaust discharge contains deadly gases. Do not operate the Laundry Advanced System (LADS) in an enclosed area without proper ventilation. Severe personnel injury or death because of carbon monoxide poisoning could result. Operate the LADS at ambient temperatures between 33°F and 120°F outside of a shelter. If ambient temperatures are below 33°F, or environmental conditions such as blowing dust, sand, rain, and solar radiation are present, operate the LADS in a Modified Type II Lightweight Maintenance Enclosure (LME).

SHOWER AND LAUNDRY GENERAL HOUSEKEEPING

Daily cleaning of S&L facilities and equipment using an appropriate detergent solution breaks down soils and residues that harbor odor- and disease-causing microbes. The presence of soil creates a barrier around microbes and prevents adequate disinfection. See Department of the Army Pamphlet (DA Pam) 40-11, *Army Public Health Program* (18 May 2020), for more information about how to reduce the incidence of preventable infections.

Unless dealing with infectious agents, laundry units should instruct supported units (or hospital staff) to remove the majority of any solid mass (specifically feces and vomit) deposited on laundry before the laundry is turned in. Other than wearing gloves, there is no special treatment or processing required for removal of feces or vomit from regular shower operations: remove the gross contaminant, clean with a detergent, and disinfect with bleach or other Environmental Protection Agency-approved disinfectant.

Emergency procedures are needed for laundry and shower support scenarios in which a highly infectious agent may be involved (Operation United Assistance - Ebola). In these situations, units should develop an emergency cleanup procedure for incidents when shower or laundry surfaces are contaminated with blood, feces, or vomit. Additionally, each S&L section should have a cleanup kit with appropriate supplies and PPE for conducting a gross contamination cleanup. Give all personnel an orientation on the emergency cleanup procedure and the location(s) of associated supplies. Consult with supporting preventive medicine personnel for assistance in developing the procedures.

For daily cleaning and sanitizing of S&L facility surfaces (outside of a healthcare setting), use ready-to-use chlorine bleach solution to disinfect surfaces. Many cleaning products contain a minimum free available chlorine concentration that typically exceeds 500 parts per million; products identified on the Environmental Protection Agency list G and L contain significantly higher concentrations. The Centers for Disease Control and Prevention (CDC) recommends application between 500 and 5,000 parts per million free available chlorine, depending on the amount of organic material (blood, urine, or mucous) present on the surface. In the typical S&L operation, personnel use 500 parts per million free available chlorine for general housekeeping of the facilities.

Disinfection is a process of inactivating or destroying harmful microorganisms (germs) from nonliving or inert surfaces. It is different from sterilization, which is the removal or destruction of all forms of life, including bacterial spores. There are many chemical products specially formulated for disinfecting surface types and textiles. The effectiveness of the product to destroy different types of harmful microorganisms depends on the disinfecting agent, the chemical concentration, and contact time; therefore, selecting an appropriate product for the intended application is important. A chlorine disinfecting solution can easily be prepared using plain household bleach and is more cost effective than purchasing ready-to-use commercial products.

Gloves are the minimum PPE when preparing bleach. To prepare 500 parts per million solutions from a chlorine product with a base strength of 5.25 percent, mix 0.25 cup (59 milliliters) of bleach with one gallon (3.8 liters) of water. To prepare 500 parts per million solutions from a chlorine product with a base strength of 8.25 percent, mix 1.5 tablespoons (22 milliliters) of bleach with one gallon (3.8 liters) of water. Prepare disinfecting solutions fresh each day. Do not produce overly concentrated solutions as this can cause respiratory irritation and induce an asthma attack in susceptible individuals. Ensure the area is well ventilated during use. Clean surfaces using a detergent solution before applying the disinfectant. Clean, rinse, and then apply the disinfectant using a spray bottle or wiping application.

Allow a one-minute contact time to ensure adequate disinfection and then rinse residual disinfectant from the surface using clean water. Refer to Technical Bulletin (TB) Medical (MED) 531, *Facility Sanitation Controls and Inspections* (1 March 2019) for additional information.

Coordinate with the personnel responsible that identify and remedy plumbing leaks to prevent attracting pests such as rodents and cockroaches.

CHAPTER 9

Maintenance

Shower and laundry (S&L) section leaders, platoon leaders, and commanders at all echelons with assigned S&L elements should establish command emphasis on standards to ensure the maintenance of S&L equipment. Refer to Army Regulation (AR) 750-1, *Army Materiel Maintenance* (2 February 2023) for more information on individual responsibilities for the maintenance of Army materiel. Leaders should conduct spot checks and follow-up inspections of all S&L equipment. If equipment does not function, troubleshoot according to the technical manual and ensure prompt reporting of deficiencies, malfunctions, or failures for evacuation according to the local maintenance guidelines.

When performing preventive maintenance checks and services, S&L personnel can fix problems within responsibilities for operator maintenance. The following are common problems that can be detected by a visual inspection:

- Continuously check for loose bolts, clamps, nuts, and screws. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Tighten them when loose.
- Check welded areas for chipped paint, rust, corrosion, or gaps.
- Tighten loose connectors. Look for cracked or broken insulation, bare wires, and broken connectors. Report any problems to unit maintenance personnel.
- Look for wear, for damage and leaks in the hoses and fluid lines, and to make sure clamps and fittings are tight. Wet spots mean a leak. A stain by a fitting or connector can also mean a leak.
- Ensure S&L equipment receives all scheduled and unscheduled services. It may require extra services and care when operated under harsh conditions such as high or low temperatures, long periods of hard use, or continued use in sand, water, mud, or snow.
- Monitor the condition of numbered mesh bags for serviceability. Replace bags when there are holes or the zippers do not work.

GLOSSARY

ACRONYMS AND ABBREVIATIONS

APD	Army Publishing Directorate
APHC	Army Public Health Center
AO	area of operation
AR	Army regulation
ATP	Army techniques publication
BCT	brigade combat team
BSB	brigade support battalion
CAC	common access card
CASCOM	U.S. Army Combined Arms Support Command
CBL	Containerized Batch Laundry
CDC	Centers for Disease Control and Prevention
COMPO	component
DA	Department of the Army
DA Pam	Department of the Army pamphlet
DNBI	disease and nonbattle injury
DSSB	division sustainment support battalion
FM	field manual
FMSWeb	Force Management System Web
FY	fiscal year
HNS	host-nation support
ISO	International Organization for Standardization
LADS	Laundry Advanced System
LME	Lightweight Maintenance Enclosure
LOGSTAT	logistics status
M	modular
MED	medical
MOS	military occupational specialty
MTOE	modified table of organization and equipment
NCO	noncommissioned officer
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
QM	quartermaster
S&L	shower and laundry
SOP	standard operating procedure
SPO	support operations
TB	technical bulletin
TM	technical manual
TSC	theater sustainment command
USG	United States Government

REFERENCES

SHOWER AND LAUNDRY OPERATION MANUALS

1. Army Techniques Publication (ATP) 4-42, *Material Management, Supply, and Field Services Operations* (2 November 2020)
2. Technical Manual (TM) 10-3510-221-10, *Operator's Manual for Laundry Advanced System (LADS)* (7 July 2008)
3. Technical Manual (TM) 10-4510-207-13&P, *Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for 12-Head Shower System* (10 June 2013)
4. TM 10-3510-226-10, *Operator's Maintenance Manual for Containerized Batch Laundry (CBL)* (31 August 2005)
5. TM 10-4520-266-13&P, *Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for Heater, Water, 400,000 BTU (WH-400)* (9 March 2018)
6. TM 10-5430-237-12&P, *Operator's and Unit Maintenance Manual for Tank, Fabric, Collapsible; Air Column Supported, Open Top Water Storage* (15 October 2000)

RESOURCE LINKS

1. Military occupational specialty (MOS) 92S equipment instructional videos (CBL/LADS/showers): <https://vimeo.com/showcase/7535593>
2. U.S. Army Combined Arms Support Command (CASCOM) training technology division videos: <https://vimeo.com/usarmycascomtttd>
3. MilSuite: https://www.milsuite.mil/book/community/spaces/sustainnet/quartermastercommunity/field_services
4. 92S Field Services Training Division email: usarmy.gregg-adams.tradoc.list.qms-fsd@army.mil
5. Force Management System (FMS) Web: <https://fmsweb.fms.army.mil/>
6. Army Publishing Directorate (APD): <https://armypubs.army.mil/>
7. Centers for Disease Control and Prevention (CDC): <https://www.cdc.gov/>
8. Occupational Safety and Health Administration (OSHA) for hospital linen: <https://www.osha.gov/SLTC/etools/hospital/laundry/laundry.html>
9. QM Blackboard: <https://qm.ellc.learn.army.mil/>



CENTER FOR ARMY LESSONS LEARNED

10 Meade Avenue, Building 50
Fort Leavenworth, KS 66027-1350



**U.S. ARMY
COMBINED
ARMS CENTER**



**COMBINED ARMS
CENTER - TRAINING**

**NO. 23-693
2023**

Approved for Public Release
Distribution Unlimited