REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*

2. REPORT DATE
14/05/95

3. REPORT TYPE AND DATES COVERED
MONOGRAPH

4. TITLE AND SUBTITLE
THE IMPLICATIONS OF WEAPON SYSTEM REPLACEMENT OPERATIONS AT THE OPERATIONAL LEVEL OF WAR

5. FUNDING NUMBERS

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
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ATTN: ATZL-SWV
FORT LEAVENWORTH, KANSAS 66027-6900
COM (913) DSN

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

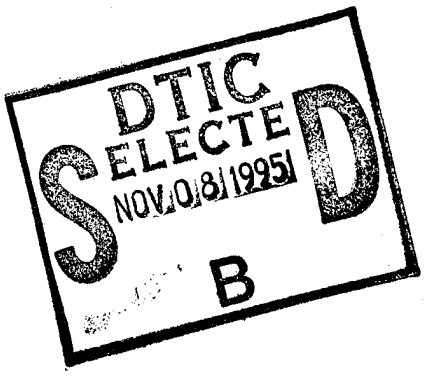
10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*
SEE ATTACHED



19951107 096

DTIC QUALITY INSPECTED 5

14. SUBJECT TERMS
OPERATIONAL LOGISTICS
WSRO
REPLACEMENT OPERATIONS
WEAPON SYSTEM REPLACEMENT OPERATIONS

15. NUMBER OF PAGES
52

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UNLIMITED

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THE IMPLICATIONS OF WEAPON SYSTEM REPLACEMENT OPERATIONS AT THE OPERATION LEVEL OF WAR

A Monograph
by
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Second Term AY 94-95

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

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Title of Monograph: The Implications of Weapon System Replacement Operations at the Operational Level of War

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Accepted this 19th Day of May 1995

ABSTRACT

THE IMPLICATIONS OF WEAPON SYSTEM REPLACEMENT OPERATIONS AT THE OPERATIONAL LEVEL OF WAR
by MAJ Bruce J. Reider, USA, 49 pages.

This monograph examines the concept of weapon system replacement operations (WSRO) to determine its validity at the operational level of war. WSRO is a doctrinal method for providing tactical commanders with ready-to-fight replacement weapon systems during war. The purpose of WSRO is to reduce the logistical burden on combat commanders in order for them to concentrate on warfighting.

This monograph begins with an introduction to describe the nature of the problem and the research methodology. The next section reviews the development of the WSRO concept and the U.S. Army's current doctrine for weapon system replacement operations. The third section describes U.S. Army weapon system replacement operations during Operation Desert Storm. The fourth section traces the history of replacement operations. It specifically focuses on personnel and equipment replacement during World War II. The final section of the monograph contains an analysis of WSRO to determine its validity as an operational level logistics function. The final section also includes recommendations for improving WSRO doctrine.

The concept of weapon system replacement operations is valid at the operational level of war. The operational level is the only echelon capable of integrating strategic resources to fulfill tactical requirements. The U.S. Army should refine the WSRO concept to accomplish efficient replacement operations during war.

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I. INTRODUCTION

The evolving geopolitical environment of the 1990s forced the United States Army to downsize and to transition from a strategy of forward deployment to a strategy of force projection. Since 1989, the Army released over 400,000 soldiers and civilian employees and reduced the active component from 18 to 10 divisions. The Army also redeployed more than 250,000 soldiers and family members and removed over 50,000 vehicles and 533,400 tons of ammunition from Europe.[1] The transition from a forward-deployed Army to a force-projection Army had a significant impact on operational level logistics.

Operational logistics links tactical sustainment requirements to strategic capabilities in order to sustain extended operations. Strategic logistics is a function of the production capability of the nation's industrial base; whereas, tactical logistics concentrates on readiness to conduct operations.[2]

The conduct of operational level logistics extends from forward operating bases located within the theater communications zone (COMMZ) to the strategic logistics infrastructure located within the continental United States (CONUS).[3] Supplying replacement personnel and equipment to a deployed force over such extended lines of communication is just one of many challenges to the operational level logistics system.

This monograph examines that challenge to determine whether the concept of weapon system replacement operations (WSRO) is valid at the operational level of war. WSRO is a doctrinal concept for replacement operations during war. The United States Army Training and Doctrine Command (TRADOC) developed the concept of weapon system replacement operations to reduce the logistical burden on combat commanders in order for them to concentrate on warfighting.

The WSRO concept treats crew-served weapons as systems having three features. The first feature is the piece of equipment or the weapon itself. The second feature is the personnel that crew the weapon. The third feature is the training required to make the system "ready-to-fight." The purpose of WSRO is to provide units with "ready-to-fight", fully operational replacement weapon systems.

TRADOC published a test publication (WSRO TEST 12-16-1) in December 1981 that described the WSRO concept. The preface of WSRO TEST 12-16-1 stated that "WSRO requires test and evaluation to assure the concept is sound."[4] There is no evidence to suggest that the U.S. Army ever formally tested or evaluated the WSRO concept; yet it became doctrine.

Operation Desert Storm forced the U.S. Army to put its weapon system replacement operations doctrine into practice. To a certain extent, Operation Desert Storm became the test and evaluation exercise of the WSRO concept that the U.S. Army failed to conduct during the 1980s.

The research methodology focused on three key areas: weapon system replacement operations doctrine, weapon system replacement operations during Operation Desert Storm, and a historical overview of U.S. Army replacement operations, Each key area includes a presentation of the facts and an analysis of those facts.

The majority of the evidence for this monograph comes from three sources. The first source is U.S. Army doctrinal publications. These manuals serve as a source of current doctrine on weapon system replacement operations. The second source is archival papers pertaining to weapon system replacement operations during Operation Desert Storm. An examination of these papers shows the effectiveness of WSRO during Operation Desert Storm. The third source is official historical reports on U.S. Army replacement operations. These reports trace the development of U.S. Army replacement operations as a basis for comparison to current doctrine.

The final section of the monograph concentrates on synthesizing the information and analyses from the three key areas. This section has a dual purpose. The first purpose is to answer the research question whether the concept of weapon system replacement operations is valid at the operational level of war. The second purpose is to propose recommendations for improving weapon system replacement operations doctrine.

II. WEAPON SYSTEM REPLACEMENT OPERATIONS DOCTRINE

Section II, Weapon System Replacement Operations Doctrine, is the first of three key areas contained in this monograph. The purpose of Section II is to present an overview and analysis of weapon system replacement operations doctrine. It begins with a definition of WSRO and an explanation of the concept. It then traces the development of the WSRO concept followed by a summary of the U.S. Army's current doctrine for weapon system replacement operations. Section II concludes with an analysis of WSRO doctrine to identify strengths and weaknesses of the concept.

U.S. Army doctrine contains several different definitions of WSRO. FM 100-16, Support Operations: Echelons Above Corps, dated 16 April 1985, says WSRO is "a management tool used to supply the combat commander with fully operational major weapon systems - both combat vehicle and crew."[5] Its successor, FM 100-16, Army Operational Support (Final Draft), dated 4 April 1994, defines WSRO as a "management tool used to link up personnel and equipment at the COMMZ [communications zone] or the corps or division support areas as a 'ready-to-fight' weapon system."[6] U.S. Army Command and General Staff College (USACGSC) student texts simply describe WSRO as a management tool used to supply the combat commander with fully operational weapon systems, including required equipment and trained crews.[7]

These definitions vary slightly but the intent of the WSRO concept remains consistent with that of WSRO Test Publication 12-16-1. That intent is to relieve the logistics burden on combat commanders by providing them with equipped, manned and trained replacement weapon systems during war.[8]

Several other definitions are essential in order to understand weapon system replacement operations. The first definition is "ready-for-issue". A weapon is ready-for-issue after echelons above corps (EAC) units remove it from preservation and make it mechanically operable according to current serviceability criteria or other appropriate standards. It includes all ancillary equipment such as machineguns, radio mounts and radios. It is full of fuel and has all its basic issue items (BII). However, there is no ammunition aboard.[9]

The second definition is "ready-to-fight". A ready-to-fight weapon system is a ready-for-issue weapon that is crewed, boresighted and verified with a basic load of ammunition stored onboard.[10] A critical function of WSRO is the conversion of a ready-for-issue weapon into a ready-to-fight weapon system.

The final definition is "link-up." WSRO TEST 12-16-1 defines link-up as "the process of joining a ready-for-issue weapon with a trained crew."[11] The replacement crew converts a ready-for-issue weapon into a ready-to-fight weapon system at the link-up point.

The focal point of weapon system replacement operations is the weapon system manager (WSM). Tactical commanders at every echelon from corps through battalion appoint weapon system managers to intensively manage weapon system replacement operations for their units.[12] The WSM at corps and division level is normally an officer from within the material management center (MMC), although the commander may designate the G-3 as the WSM. The executive officer usually acts as the WSM in brigade and battalion size units.[13] Weapon system managers monitor the status of specific weapon systems and allocate replacement weapon systems to subordinate units according to the commander's priorities.[14]

The WSM uses the weapon system status report (WESS) to monitor the status of weapon systems. The WESS reflects unit losses by equipment and personnel and provides a summary of weapon and crewmember shortages.[15] The weapon system manager sends higher headquarters a consolidated WESS to report the status of WSRO-managed systems within the unit. This process facilitates the distribution of replacement systems.

Personnel replacements come from a variety of locations which generally fall into two categories. The first category is personnel replacements arriving in theater. The second category is return-to-duty (RTD) personnel.[16] Personnel replacements move to the link-up points by the most expeditious means possible.

Equipment replacements come from any of four sources. The first source is from the continental United States. The second source is pre-positioned war reserve materiel stocks (PWRS). Operational readiness float (ORF) equipment is the third source of replacement equipment. Maintenance repairs are the fourth source of equipment replacements.[17] Ready-for-issue weapons usually move via rail to their designated link-up point. They may also road march or move on heavy-equipment transporters (HETs).

The Quartermaster Heavy Material Supply Company (General Support) in the theater army area command (TAACOM) or corps support command (COSCOM) is responsible for deprocessing weapons arriving from CONUS and PWRS. Direct support maintenance (DSM) units at corps and division make the ORF ready-for-issue. Regardless of the source, replacement equipment must be ready-for-issue when it enters the WSRO process.

The weapon system replacement process begins when replacement personnel link-up with replacement equipment. The primary link-up point for divisional replacements is the division support area (DSA). Replacements for non-divisional units link-up in the corps rear area.[18] The intent of the weapon system replacement operations concept is to convert ready-for-issue weapons into ready-to-fight weapons in a more stable area than the battalion field trains or the brigade support area (BSA).[19]

Experienced crewmembers such as RTD personnel should form the nucleus of replacement crews whenever possible. Experienced crewmembers allow WSMs to reduce training time for replacement crews. The new crews and their weapon system may rejoin their unit or join another unit depending upon replacement priorities.[20]

Following link-up, the replacement crew, together with support personnel, makes the weapon ready-to-fight. A boresighted and verified weapon together with its basic load of ammunition is ready-to-fight. The crew may undergo additional training if time and conditions permit. Additional training may include gunnery, driver training, or crew drills. At a minimum, additional training should familiarize replacement crews with operating conditions in the combat zone.[21]

The WSM allocates ready-to-fight weapon systems according to the commander's priorities. Ready-to-fight weapon systems move directly from corps or division link-up points to the battalions. Normally brigades do not receive ready-to-fight weapon systems; however, the brigade WSM may designate priorities for weapon system replacement.

The replacement weapon system may road march or move on a HET to its gaining unit. An escort should guide the replacement weapon system to the gaining unit if the tactical situation permits.[22] Once the replacement weapon system reaches its gaining unit the WSRO process ends.

TRADOC first described the operational concept for weapon system replacement operations in TRADOC Pam 525-5, The Airland Battle and Corps 86, dated 25 March 1981. TRADOC Pam 525-5 provided the catalyst that eventually resulted in the U.S. Army's current WSRO doctrine. The U.S. Army Soldier Support Center and the U.S. Army Logistics Center developed the concept further and produced WSRO TEST 12-16-1 in December 1981.[23]

WSRO TEST 12-16-1 never developed beyond a test publication. Instead, the Army incorporated the WSRO concept without modification directly into many of its doctrinal manuals. Current U.S. Army doctrine for weapon system replacement operations is essentially the same as that outlined in WSRO TEST 12-6-1.

FM 63-3J, Combat Service Support Operations - Corps, dated 12 August 1985, devoted an entire appendix to the weapon system replacement operations concept. FM 100-16, Support Operations: Echelons Above Corps, dated 16 April 1985, also included a lengthy discussion of WSRO. Both of these manuals are current doctrine.

An apparent disconnect exists somewhere in the doctrinal development process. On 23 April 1993, the U.S. Army Logistics Management College (ALMC) submitted a Department of the Army (DA) Form 2028, Recommended Changes to Publications and Blank Forms, to the U.S. Army Adjutant General School following their review of the coordinating

draft of FM 12-6, Personnel Doctrine. ALMC recommended deleting the term "WSRO" from the manual. ALMC stated that WSRO was an "absolute term" which they no longer used "to avoid misconceptions about the existence of a separate WSRO system."[24] As a result, FM 12-6, Personnel Doctrine, dated 9 September 1994, does not mention WSRO. ALMC's logic stems from feedback they received concerning weapon system replacement operations during Operation Desert Storm.

However, the U.S. Army continues to use the term WSRO in new doctrinal manuals to describe its method for replacing weapon systems. The final draft of FM 100-16, Army Operational Support, dated 4 Apr 1994, still used the term WSRO, but it also referred to the WSRO process as "weapons system managements."[25]

Additionally, the U.S. Army Command and General Staff College continues to teach the WSRO concept in the Command and General Staff Officer Course (CGSOC). USACGSC Student Text 63-1, Division and Corps Logistics, dated 1 June 1994, contains a description of the WSRO concept that corresponds to existing doctrine.

Although there may be some discrepancy in its title, the operational concept that TRADOC developed in the late 1970s/early 1980s remains valid as the U.S. Army's doctrine for weapon system replacement operations. Figure 1 graphically depicts the flow of information and personnel and equipment replacements within the WSRO system.

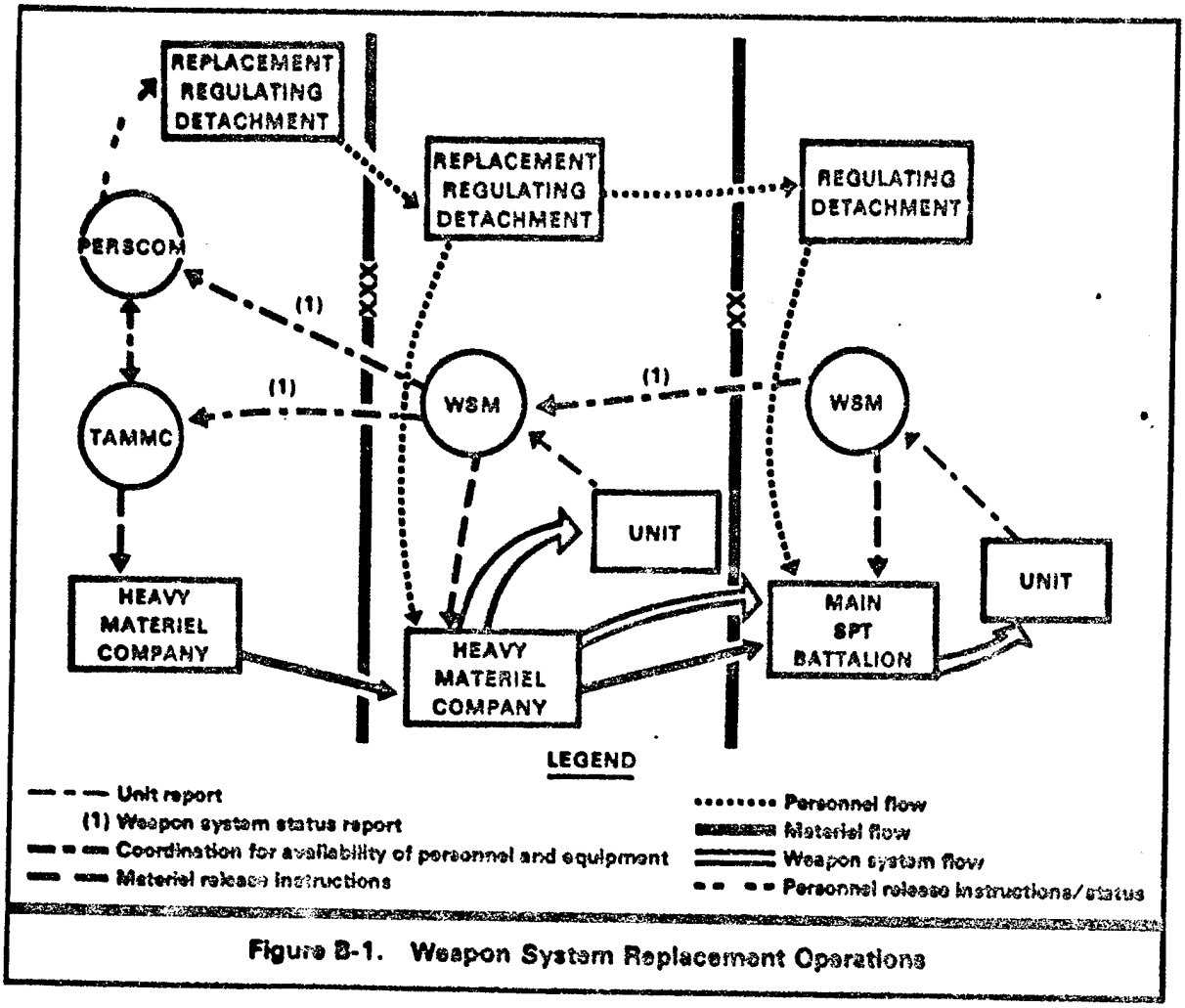

Figure B-1. Weapon System Replacement Operations

Figure 1 - WSRO Concept[26]

The U.S. Army chose to adopt WSRO as doctrine without conducting a thorough evaluation of the concept. Furthermore, there is no evidence to suggest that the Army thoroughly analyzed the concept to determine its relative strengths and weaknesses. The result was the adoption of a method for replacing weapon systems that was conceptually sound but insufficiently developed.

The fundamental advantage of the WSRO concept is its intent to reduce the burden on the combat commander by providing his unit with ready-to-fight weapon systems. Successful WSRO operations allow the commander and his staff to concentrate on fighting and sustaining combat operations.

One of the positive aspects of WSRO is the notion of a weapon system manager responsible for monitoring the status of critical weapon systems within the unit. The WSM provides the commander with an ability to continuously track weapon system replacement operations. WSRO is a priority based system. Weapon system managers allocate weapon systems according to the commander's priority for support or the main effort. The WSRO concept allows the commander to influence battlefield operations simply by articulating his priorities.

The weapon system status report is another strength of WSRO. Through the WESS report the weapon system manager can pass information concerning critical weapon systems directly to the WSM at the next echelon.

Several shortcomings overshadow the conceptual soundness of WSRO. They are a result of inadequate development of the WSRO concept into doctrine.

Weapon system replacement operations are multifaceted. They involve personnel replacement, equipment replacement, training, transportation and supply operations. However, doctrine does not fix responsibility for the overall conduct of WSRO operations. A separate organizational structure to integrate the various functions and execute WSRO does not exist at any echelon. As a result, the overall effort could be uncoordinated. While replacement operations may function on a small scale at the tactical logistics level, success is unlikely at the operational logistics level without a command and control structure to oversee its execution.

Another unresolved issue is the question of training. Separate organizations exist to provide people, equipment, transportation and supplies to the WSRO system. However, there is no organization available to conduct the training necessary to make a weapon system ready-to-fight. At a minimum, training requires ranges and qualified cadre. Requirements to conduct large scale training at the operational logistics level exacerbate the problem.

The Army might have identified these problems if it had thoroughly tested and evaluated the WSRO concept. It could also have taken steps to resolve these issues before WSRO was put to the ultimate test during Operation Desert Storm.

III. WSRO DURING OPERATION DESERT STORM

The great lesson of the operational art for Desert Storm . . . is in the extent to which logistics dominates the operational offensive."[27] The United States Third Army was responsible for many of the operational level logistics functions that contributed to the success of Operation Desert Storm. Richard M. Swain, Third Army historian, documented that success in his book "Lucky War": Third Army in Desert Storm. Third Army was three armies according to its commander, Lieutenant General John Yeosock. As Army Central Command (ARCENT), the service component for Central Command (CENTCOM), it was responsible for command over Army forces assigned in theater. It was also a theater army. Finally, Third Army functioned as a numbered field army.[28]

Section III, WSRO During Operation Desert Storm, begins with a description of the plan that ARCENT developed for theater weapon system replacement operations. ARCENT did not fully execute the plan due to the brevity of the ground operations. The casualty rates were so light that they simply did not generate many requirements for replacements. None-the-less, the theater WSRO plan generated some significant feedback. The second part of Section III summarizes the major after-action review (AAR) comments regarding WSRO operations. Section III concludes with an analysis of weapon system replacement operations during Operation Desert Storm.

ARCENT disseminated its plan for weapon system replacement operations in a message dated 17 February 1991. The major addressees included VII Corps, XVIII Corps and 22d Support Command (SUPCOM). The ARCENT plan applied to weapon system replacement operations and operations to replace squads, crews and teams (SCTs) without major end items. ARCENT envisioned a separate concept for each operation.[29]

ARCENT defined WSRO as "small unit replacement packages with weapon systems."[30] The concept for WSRO was "to marry up small unit replacement packages with theater reserve equipment, and conduct calibration firing/weapon system familiarization to provide ARCENT with ready-to-fight small units."[31]

SCTs consisted of two categories. The first category included light infantry and engineer squads that required training but did not require major end items of equipment. The second category was crews or teams required to man weapons that were not available in the theater reserve for replacement operations. ARCENT initially included artillery in this category.[32] The concept for SCT replacement was "to provide trained small units which will fall in on unit equipment, ready-to-fight."[33] ARCENT stipulated that "squads, crews and teams without major end items will not be used as individual replacements."[34] This stipulation became a major point of contention between ARCENT and its subordinate units.

ARCENT divided the responsibilities for weapon system and squad, crew and team replacement operations among the various staff elements and subordinate organizations. Within the ARCENT staff, the G-1 was responsible for personnel replacement policy. The G-3 exercised overall staff responsibility for weapon system and SCT replacement operations and allocated ready-to-fight weapon systems to the corps. The G-3 also assigned missions to replacements that completed training but were not yet allocated to corps. The G-4 managed class V and class VII supply in support of WSRO.

Among subordinate units, the 7th Army Training Command (ATC) trained non-aviation replacements and the 5-229 Aviation Battalion, 22d Aviation Brigade, trained aviation replacements. The ARCENT Support Command exercised command responsibility for weapon system replacement operations. SUPCOM provided supplies, life support, maintenance, transportation and range support to the WSRO process. The ARCENT Personnel Command obtained personnel replacements and provided command and control of replacement weapon systems and SCTs until they reached their units of assignment. ARCENT tasked VII and XVIII Corps each to identify a WSM as a single point of contact for WSRO operations within their unit. Each corps was also responsible for providing guides to lead replacements from the linkup point to drop off points within the corps area.[35]

ARCENT planned to receive a total of 25,883 replacement personnel over the course of Operation Desert Storm. The flow of replacement personnel would occur in three phases through G+55. There were no replacements programmed beyond G+55. They expected 12,000 individual theater replacements, 11,241 RTD personnel and 2642 personnel for WSRO and SCT training. The first 480 replacement personnel destined for WSRO or SCT training were to arrive in theater on 20 January 1991. They would be followed by an additional 480 on 25 January, 1574 on 30 January and 180 on 5 February.[36] Replacement personnel and equipment from outside the theater would move to link-up points after processing at their point of debarkation (POD). Replacements within the theater, such as RTDs and maintenance returns, would also move to link-up points as soon as they were ready for duty.

The theater link-up point for aviation equipment and personnel was Dhahran, Saudi Arabia. The ARCENT plan for aviation crews included both ground school and theater flight orientation training. Ground school topics included desert operations, survival and evasion procedures and a threat orientation. Flight orientation training concentrated on navigation and communications procedures.[37]

The link-up point for non-aviation personnel and equipment was also in Saudi Arabia at King Khalid Military City. Their training focused on maintenance, tactical procedures, gunnery, vehicle recognition and crew drills.[38]

Table 1 lists the quantity of replacement weapon systems or SCTs that ARCENT hoped to train during the war.

Weapon System or SCT Type	Quantity
M1A1 Main Battle Tanks	116
M2 Infantry Fighting Vehicles	108
M3 Cavalry Fighting vehicles	24
155mm SP Howitzer Crews	24
203mm SP Howitzer Crews	8
105mm Towed Howitzer Crews	8
155mm Towed Howitzer Crews	8
MLRS Crews	9
Light Infantry Squads	27
Light Engineer Squads	9
Heavy Engineer Squads	27
AH-64 Attack Helicopters	18
AH-1F Attack Helicopters	9
UH-60 Helicopter Crews	15
OH-58D Observation Helicopters	10
OH-58C Helicopter Crews	9
CH-47D Cargo Helicopters	8

Table 1 - ARCENT Weapon System and SCT Training Goals[39]

After completion of their training, weapon systems and SCTs would become available as replacements. ARCENT established procedures for subordinate units to request allocation of WSRO assets. However, ARCENT preprogrammed the

allocation of two major weapon systems for planning purposes. ARCENT anticipated allocating 48 M1A1 main battle tanks and 29 M2 infantry fighting vehicles to VII Corps, while XVIII Corps could expect to receive 14 tanks and 15 infantry fighting vehicles.[40] ARCENT's estimate left 54 tanks and 54 infantry fighting vehicles for contingency purposes.

ARCENT also issued employment guidance on the use of weapon systems and SCTs as part of its plan.

> to piecemeal their skills to meet individual replacement requirements defeats the purpose of the program and wastes a valuable asset. . . As a rule, crew integrity will be maintained. It may also be prudent to team up replacement crews with combat experienced crews to shorten the learning curve (this does not imply splitting the crew, only providing a combat experienced crew as mentors).[41]

This guidance clearly emphasized the employment of weapon systems and SCTs as packages.

ARCENT distributed its plan for weapon system replacement operations to its subordinate units on 17 February 1991.[42] The ground war began exactly one week later. G-Day became 24 February 1991. Four days later, General Schwarzkopf, Commander-in-Chief, CENTCOM, ordered a halt to offensive operations and initiated a temporary cease-fire.[43]

ARCENT was never able to fully execute its WSRO plan. The short duration of the ground war and relatively light casualties led ARCENT to terminate WSRO operations and focus its attention on post-hostility issues.

The ARCENT plan for weapon system and SCT training and replacement operations generated considerable feedback after Operation Desert Storm. Remarks ranged from very favorable general observations to highly critical comments on specific issues.

ARCENT viewed Operation Desert Storm WSRO and SCT replacement operations as successful. They modified existing WSRO procedures and came up with a non-doctrinal approach to weapon system replacement operations. ARCENT raised WSRO from the tactical level of logistics to the operational level of logistics by centralizing WSRO responsibility at the theater army. They expected "a relatively short violent conflict in which there would be insufficient time for the divisions to conduct this type of operation."[44] Their AAR suggested expanding WSRO doctrine to make it an operational level logistics function.[45]

The ARCENT after-action review criticized one aspect of the WSRO process. Class II organizational equipment was not available from theater reserve stockages to support WSRO operations. ARCENT specifically cited the lack of binoculars and night vision devices. Replacement personnel deployed with only their individual equipment and weapons.[46] The gaining unit is supposed to provide organizational equipment for weapon system or SCT replacements according to WSRO doctrine. However, WSRO depends upon many Class II supply items to produce ready-to-fight weapon systems.

The ARCENT staff coordinated theater weapon system replacement operations and subordinate organizations executed those operations. The 22d SUPCOM was a key player in the execution process. They prepared 116 M1A1 main battle tanks and 108 M2 infantry fighting vehicles as ready-to-fight weapon systems by G-Day. They also trained 57 artillery crews of all types and 27 light infantry squads as SCT replacements by G-Day.[47] The 22d SUPCOM executed its mission according to the ARCENT plan. From their perspective WSRO and SCT replacement operations were also successful.

Remarks varied among the tactical units that received WSRO products. The VII Corps Operation Desert Shield/Desert Storm AAR praised the conduct of weapon system replacement operations during the war. "Weapon system replacement operations were successfully used to support combat during the Iraqi War."[48]

On the other hand, the 1st Infantry Division sharply criticized weapon system replacement operations. "The WSRO crew and vehicle replacement system may not be the best notion."[49] Their complaint focused on ARCENT's guidance to maintain the integrity of weapon systems and SCTs provided through the WSRO system. WSRO worked fine when they had to replace complete weapon systems; however, most often they only needed to replace either the weapon or a single crew member. In their opinion, the WSRO concept limited the tactical commander's flexibility.[50]

The Desert Storm Special Study Project report listed the employment of weapon system and SCT replacements as an operational sustainment issue. "Squads, crews and teams deployed to theater for the purpose of WSRO were used as individual replacements."[51]

Employment of weapon systems and SCTs was the most significant WSRO issue to come out of Operation Desert Storm. It attracted the attention of General Saint, Commander-in-Chief, United States Army Europe (CINCUSAREUR). Many replacement weapon systems and SCTs came from USAREUR. General Saint sent a message to General Sullivan (Chief-of-Staff of the Army), General Foss (Commander TRADOC), Lieutenant General Franks (Commander VII Corps) and Major General Tait (Chief, Desert Storm After Action Review). General Saint was concerned over the fragmenting of crews to provide individual replacements. He also noted that "crews had difficulty proving their proficiency to gaining commanders, and generally they were not accepted as part of the organization."[52] According to General Saint, the issue was "how important is team work of a crew operating a system?"[53] He recommended reviewing the WSRO concept to determine its validity.[54]

Perhaps the time had come for the Army to fully examine its procedures for WSRO. Operation Desert Storm underscored the need for a method to conduct weapon system replacement operations that worked both on paper and in practice.

The planning and conduct of weapon system replacement operations during Desert Storm provided an ideal representation of operational level logistics. ARCENT successfully linked strategic sustainment capabilities to tactical supply requirements. They drew from strategic sources to combine replacement personnel provided primarily by CONUS and USAREUR organizations with replacement equipment drawn principally from theater reserve stocks. They coordinated a theater-wide training effort to produce ready-to-fight weapon systems for allocation to tactical units.

ARCENT's mission analysis accurately determined the nature of the conflict. Their assessment led them to decide correctly to conduct weapon system replacement operations at the theater level. That decision lent credence to the WSRO concept by reducing the logistical burden on the tactical commander.

ARCENT properly tailored WSRO doctrine to the circumstances of the war. Although they concluded that their approach was non-doctrinal, their plan contained many features of WSRO doctrine. For example, they directed subordinate units to designate WSMs as the single point of contact for weapon system replacement operations. They also required subordinate units to provide guides to lead replacements forward from the link-up points. Overall, the ARCENT plan closely resembled the doctrinal concept of WSRO.

Many of the criticisms of WSRO represented legitimate concerns. No one anticipated the problem obtaining Class II organizational equipment for replacement weapon systems or SCTs. The gaining unit was supposed to provide organizational equipment to replacements upon assignment. However, WSRO required replacements to train with these items to produce a ready-to-fight weapon system. In this case, a comprehensive evaluation of the WSRO concept during the 1980s might have identified this easily corrected problem.

The employment of weapon systems and SCTs was a larger issue that required a balanced solution. ARCENT based their entire plan for weapon system replacement operations on the intent to produce trained weapon systems and SCTs. Routine division of WSRO products would undermine the concept. On the other hand, tactical commanders needed the flexibility to use replacements to support their operations. General Saint's message articulated the problem succinctly. Operation Desert Storm emphasized the need for other personnel and equipment replacement options to complement WSRO.

Desert Storm validated many aspects of the WSRO concept. However, it also identified many unresolved issues. The next section examines operational level logistics during World War II to ascertain alternative methods for weapon system replacement operations.

IV. REPLACEMENT OPERATIONS DURING WORLD WAR II

The WSRO concept did not exist during World War II. Armies used a variety of other approaches to replace personnel and equipment. The U.S. Army replaced personnel and equipment separately through independent systems, while the British and German armies each developed their own unique methods for replacement operations. Conceptually, however, all three systems were basically the same. They all treated personnel and equipment replacement operations as unrelated functions. All three armies realized the need to train personnel replacements, especially those manning crew-served weapons. But none of them treated crew-served weapons as integrated systems consisting of personnel, training and equipment. "The underlying philosophy seemed to be that men, like equipment were interchangeable parts of a vast fighting machine."[55]

The purpose of Section IV, Replacement Operations During World War II, is to examine alternative methods for operational level weapon system replacement operations. Section IV starts by tracing the evolution of modern replacement operations from its origin during World War I through its development during the inter-war years. The next part describes the American, British and German systems for replacement operations during World War II. Section IV concludes with an analysis of those replacement operations to determine alternative approaches to WSRO.

The United States Army entered World War I without a formal replacement system.[56] The recruiting service provided sufficient replacement personnel to satisfy the requirements of a peacetime volunteer army prior to World War I. Although the Army experienced minor problems manning its patrols along the Mexican border, the situation did not demand the creation of a separate replacement system.[57]

"The staggering weight of unanticipated personnel casualties"[58] during World War I caused the U.S. Army to create a separate system to replace combat losses. The Allied armies fighting in Europe desperately needed replacement personnel as early as April 1911. They looked to the United States. The Allies lacked confidence in the ability of the U.S. Army to deploy large independent units to Europe in time to stop the Germans. Their plan was to use American soldiers as individual replacements within their own armies. If the Americans opposed the individual replacement option, then the Allies suggested that the U.S. Army provide small unit replacement packages for integration directly into the British or French Armies. The dilemma for United States was "whether the American Army would fight as a unit or whether American military forces would become one vast replacement depot for the British and the French."[59] The Americans agreed to a compromise solution. The U.S. Army served with the Allied armies but it retained its military organization.[60]

American military commanders believed the larger American divisions could absorb heavy losses and still continue to conduct sustained combat operations. The Army conducted decentralized replacement operations at every echelon. This system collapsed under the strain of unexpectedly high casualty rates.[61]

The U.S. Army was unprepared to perform large-scale replacement operations. Large numbers of trained personnel were not available to become individual replacements. The Army hastily sent entire divisions to the theater. The Army increased its requirement for replacements and decreased its supply of trained personnel by committing more divisions to combat duty. Some divisions deployed that were under-manned, ill-equipped or poorly-trained. These units exacerbated the problem when they began to suffer combat losses.[62]

It took the Army until 1918 to solve its replacement problems and to establish an effective system to replace combat losses. The War Department created training centers in the United States to organize, train and equip replacements.[63] It also established replacement battalions to manage theater replacements. Replacement battalions received personnel from CONUS training centers, conducted additional training and issued supplies and equipment.[64] "Indications at the time of the armistice were that the training camps offered an effective solution to the replacement problem."[65]

Plans for replacement operations continued to evolve during the inter-war years. The Army published its Manual for Commanders of Large Units in 1936. Volume II, Administrative, outlined a plan for replacement operations designed to organize, train and deploy enough personnel to maintain units a full strength during combat operations. The plan featured a two echelon system in the theater of operations. Replacement depots in the COMMZ received personnel arriving from CONUS. The replacement depots conducted additional training before they sent the replacements forward to the combat zone for subsequent assignment to specific units. Replacements would flow continuously into the COMMZ but would only flow into the combat zone in response to requisitions. The system was sufficiently flexible to handle tactical needs yet it was rigid enough to satisfy theater requirements.[66]

The U.S. Army tested its replacement procedures in September 1941 during the Louisiana maneuvers. Plans directed each army to replace simulated casualties using the depot system. The Louisiana maneuvers produced two recommendations for improving the replacement system. First, replacement depots should locate as far to the rear of the COMMZ as possible to provide stability for processing, organizing and training replacements. Second, to improve coordination between combat units and replacement depots to ensure proper utilization of replacements.[67]

The U.S. Army entered World War II with a system for replacement operations based on its experiences from World War I and the Louisiana maneuvers. What began as a decentralized function that was part of the recruiting system had emerged into a separate system featuring some centralized control. Although the new system was structurally sound; it remained undeveloped and lacked sufficient detail. Of course, large scale replacement operations was still a relatively new concept for the U.S. Army.

The United States made one strategic decision in World War II that had a profound impact on replacement operations. American officials decided to create only 90 divisions to fight the war. That decision meant that the Army did not have enough divisions to rotate units. Divisions continued to fight until the end of the campaign. Occasionally a division moved to a "relatively inactive sector of the front"[68] for regeneration or reconstitution. The steady flow of individual replacements maintained unit strength and made unit rotation theoretically unnecessary. Even if unit rotation was needed, there were no replacement divisions to take their place. As a result the Army focused on individual and small unit replacement operations during World War II. World War II replacement operations paid little attention to the moral aspects of war or to combat motivation. The Army still viewed replacements simply as spare parts.[69]

The demand for replacements became so great by 1944 that the Army urged commanders to conduct on-the-job training of incoming personnel.[70] Units needed personnel to replace not only combat losses but also personnel lost to sickness, furloughs and disciplinary actions.[71] Each division required between 1000 and 3500 personnel per month, many of which were for nonbattle losses.[72] Eventually theater retraining became the main source of replacements within each theater.[73]

Equipment replacement during World War II also failed to function according to U.S. Army plans. Replacement personnel were supposed to link-up with replacement equipment at vehicle pools then move forward to join combat units. Units received credit for equipment they turned-in for repair. Each credit authorized the unit to draw an equivalent piece of replacement equipment. However, the system did not include time for replacement personnel to train with replacement equipment.[74]

The U.S. Army created the Department of the Army Replacement Board following World War II to study the effectiveness of the replacement system. The Replacement Board published its report in 1947. The report concluded that World War II replacement operations were ineffective. The U.S. Army did not formally approve the report of the Replacement Board. The report influenced future replacement plans but the Army never officially acted on its findings.[75]

The replacement systems of the British Army and the German Army during World War II were basically the same as that of the U.S. Army. While each had some unique features worthy of study both were generally as ineffective as the American system.

The Chief of Army Equipment and Commander of the Replacement Army centrally controlled equipment and personnel replacements for the German Army. The replacement army recruited personnel and trained them for combat units. The replacement army assigned recruits to specific units upon their induction. The Germans organized replacements into small unit packages and equipped them appropriately. Veteran soldiers trained the recruits assigned to their units. This procedure gave the veteran soldiers a temporary respite from front line duty. The small unit replacement packages moved to the front and joined their new units when they completed their training.[76]

The British system matched replacement personnel with new or repaired equipment to form small unit replacement packages. They haphazardly mixed veterans with new replacements and sent them forward as soon as replacement equipment was available. The British system did not include training time for the newly organized crews or units. Many of these type of replacement packages did not survive their first battle. Eventually the British revised their system to enable combat units to train their replacements.[77]

"The Army has never entered a war prepared to operate a personnel [replacement] system built upon the accumulated knowledge of past experience."[78] Although the Army may never have entered a war completely prepared to conduct replacement operations; its replacement system incorporated many lessons learned through past experience. The threads of those lessons began during World War I. The Louisiana maneuvers contributed to the list during the inter-war years. The experiences from World War II added more still. These lessons are clearly visible in the Army's current doctrine for replacement operations.

The following list summarizes the major lessons learned through World War II.

- The replacement system should be a separate system and not a function of another system.
- Effective replacement operations requires a centralized management system to coordinate its many aspects and improve efficiency.
- Replacement operations at the tactical level overburdens units and commanders and detracts from combat operations.
- There must be an intermediate stage (operational level) to link strategic resources with tactical requirements.
- Operational level replacement operations requires organizations dedicated strictly to receiving, processing, supporting, organizing, equipping and training theater replacements.

- Replacement organizations should operate in a stable environment in the rear of the theater.
- Theater specific training is essential to enhance the survival of replacements.
- Replacement crews and units should include combat veterans such as RTD personnel whenever possible.
- Replacing personnel and equipment and conducting training are closely related actions that must be integrated and coordinated. However, provisions must exist to separate them in order to fill specific needs.
- Tactical requirements determine replacement allocations.
- The U.S. Army should thoroughly test its replacement system and exercise it on a regular basis.

The efficient use of military manpower depends on an effective replacement system. The U.S. Army created its replacement system as casualty rates increased during World War I. The replacement system continued to evolve as needs changed. The Army strove to achieve the most efficient replacement system possible. The next section will compare current doctrine for weapon system replacement operations against the lessons of replacement operations through World War II. The last section has a dual purpose. The first purpose is to determine whether WSRO is valid at the operational level of war. The second purpose is to identify problems and make recommendations that will help the U.S. Army effectively manage replacement operations.

V. CONCLUSION AND RECOMMENDATIONS

The concept of weapon system replacement operations is valid at the operational level of war. Operational level logistics is more important today than ever before. The U.S. Army logistics system no longer enjoys the luxury that forward deployment provided. The challenges of supporting a smaller force projection army are great and the margin for error is small.

Successful weapon system replacement operations engender a wide variety of functions. Those functions range from personnel replacement to training to equipment replacement operations. The tactical level of war focuses on the conduct of battles and engagements. In other words, tactics orients on activities well forward in the theater. WSRO occurs well within the rear of the theater. It may even take place in CONUS to support contingency operations in an austere or immature theater. Attempting to coordinate and integrate the WSRO functions at the tactical level would overburden tactical commanders and units and divert their attention from combat operations. That problem was exactly what TRADOC tried to solve through the WSRO concept.

The concept of weapon system replacement operations is not easy to execute. WSRO is a multi-faceted operation. It is not a panacea for all the Army's replacement problems. However it does offer a solution that could improve the overall efficiency of the U.S. Army replacement system.

The historical lessons presented in Section IV support the conclusion that WSRO is a valid concept at the operational level of war. The experiences of the British Army and the German Army both reinforce the lessons that the U.S. Army learned. First and foremost among those lessons is the recognition of the need for a plan to conduct large-scale replacement operations and a system to execute that plan.

The U.S. Army entered both World War I and World War II without an effective replacement system. In both cases the Army was beginning to implement changes when the war ended. Replacement operations had a major impact on combat but were not emphasized when the war began.

The replacement systems that eventually emerged during the wars were centrally managed at the operational level. Theater level replacement depots received personnel and equipment from CONUS and allocated them to tactical units according to command priorities and unit requirements. The U.S. Army realized the need for replacement to receive theater specific training prior to their assignment to combat units.

The major criticism of World War I and World War II replacement operations was the philosophy that men and equipment were simply spare parts that could be replaced without affecting the system. The WSRO concept attempted to overcome this misguided notion.

Operation Desert Storm provided strong evidence to support the validity of weapon system replacement operations at the operational level of war. ARCENT became the focal point for theater WSRO operations. Tactical units at every echelon from corps to battalion were free to concentrate on combat operations.

ARCENT provided many logistics functions for the entire theater. They became the operational link between the strategic level of logistics and the tactical level of logistics. The various elements of the WSRO system came together at the operational level. ARCENT coordinated all three aspects of weapon system replacement operations. They successfully linked personnel with equipment and conducted theater training.

The strategic level of logistics provided personnel replacements from outside the theater of operations. The tactical level of logistics generated personnel replacements within the theater in the form of RTD personnel. These two categories merged at the operational level.

The various types of replacement equipment also converged at the operational level. ARCENT coordinated the processing of equipment provided by the strategic level of logistics. That equipment included items from CONUS and PWRS. ARCENT also managed equipment replacements that originated at tactical levels, including ORF and maintenance returns.

Operation Desert Storm tested the concept of weapon system replacement operations. Overall, WSRO was successful during Operation Desert Storm. It demonstrated the utility of many aspects of the process. It also highlighted many shortcomings in the system.

The designation of weapon system managers at every echelon was a positive feature of WSRO. The WSMs intensively managed weapon systems for their units. Another strength of WSRO was the weapon system status report that WSMs used to monitor and report the status of critical weapon systems. WSRO operations during Operation Desert Storm verified the utility of link-up points and guides. All WSRO functions occurred at link-up points. Guides led weapon systems from the link-up points to their assigned units. Operation Desert Storm proved that the mechanics of the WSRO concept are generally sound.

Most of the shortcomings are attributable to problems concerning allocation and utilization of weapon systems and SCTs. The U.S. Army never attempted to conduct large-scale weapon system replacement operations before Operation Desert Storm. Nor did the military education system provide detailed instruction on WSRO. Many tactical commanders did not fully understand the WSRO concept. They were skeptical of claims to provide ready-to-fight weapon systems. Additionally, guidance governing the employment of weapon systems and SCTs confused some commanders.

Weapon system replacement operations is a valid concept at the operational level of war but the U.S. Army must address system shortcomings. These next two pages contain several recommendations for improving the operation of the WSRO system. Analysis of the WSRO concept, lessons learned during Operation Desert Storm and the historical development of replacement operations provided the basis for these recommendations. The U.S. Army needs to thoroughly test and evaluate the merits of each rather than simply adopting or rejecting any of them.

The first recommendation is to formally fix responsibility for weapon system replacement operations at the operational level. This would include identifying, tasking and resourcing specific theater-level organizations. One organization, preferably the theater army, should coordinate and integrate personnel replacement, training and equipment replacement. Other organizations should provide life support, equipment deprocessing, training and personnel processing. Identification of units with WSRO responsibilities would facilitate training to conduct WSRO.

The concept of weapon system replacement operations requires additional testing and evaluation to identify other potential problems. WSRO should be part of every U.S. Army training event whether it be a simulation or a major field exercise. Like many other concepts, the Army must continue to refine the WSRO process.

The U.S. Army should formalize the entire replacement system. Weapon system replacement operations are just a small piece of the Army replacement system. Other pieces include provisions that provide the ability to replace just personnel or equipment according to tactical requirements. Commanders need the flexibility to support combat operations. The replacement system should not force commanders to break up weapon systems or SCTs provided through the WSRO process. This practice not only defeats the purpose of weapon system replacement operations but also is an inefficient use of valuable resources.

Education is another area that could use improvement. Service school training would improve the understanding of WSRO concept and tend to discourage improper utilization of WSRO products.

The final recommendation is for the U.S. Army to consider modifying its current replacement procedures to incorporate the capability to conduct unit replacement operations. The decision to organize only enough divisions to fight during World War II was a strategic mistake. It did not consider the moral dimension of war. A unit replacement capability would enable the Army to reconstitute its forces before they became combat ineffective without affecting the tempo of combat operations. It would also provide the ability to rest units and conduct retraining as necessary.

This monograph began with a detailed description and analysis of the WSRO concept. Next was a report on WSRO planning and execution during Operation Desert Storm. Finally came an overview of the history of U.S. Army replacement operations from its origin during World War I through its development during World War II. The last section concluded that weapon system replacement operations is valid at the operational level of war. In fact, the evidence suggests that the operational level of war may be the only valid echelon for WSRO. The United States Army cannot afford to enter another war without the capability to conduct efficient replacement operations. The WSRO concept is one method for achieving that efficiency.

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