

USAWC STRATEGY RESEARCH PROJECT

**AMMUNITION SHORTAGES EXPERIENCED  
IN OPERATION IRAQI FREEDOM –  
CAUSES AND SOLUTIONS**

by

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## ABSTRACT

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During the conduct of Operation Iraqi Freedom (OIF) in 2003, there were several reports of ammunition shortages experienced by combat units. Sometime between the end of the Cold War and OIF, the management of ammunition was inadequate, resulting in these shortages after a relatively short campaign. This Strategic Research Project examines the possible causes of the ammunition shortages and recommends possible solutions. This examination will look into the possible reasons which led to the shortages experienced in Iraq, the requirements determination process, past procurements, inventory status, and what the Army did to fix the problem. The research done provides a basis for recommendations that can help prevent shortages of small arms ammunition in the future.



## TABLE OF CONTENTS

ABSTRACT.....	iii
AMMUNITION SHORTAGES EXPERIENCED DURING OPERATION IRAQI FREEDOM – CAUSES AND SOLUTIONS .....	1
<b>DETERMINING REQUIREMENTS .....</b>	<b>2</b>
<b>SUPPLY ISSUE.....</b>	<b>6</b>
<b>REPLENISHMENT POLICY .....</b>	<b>8</b>
<b>ATTEMPTS TO IMPROVE EFFICIENCY OF FACILITIES .....</b>	<b>8</b>
<b>PRODUCTION ISSUE .....</b>	<b>9</b>
<b>ASSET VISIBILITY AND REPORTING.....</b>	<b>9</b>
<b>WHAT WAS DONE .....</b>	<b>10</b>
<b>CONCLUSIONS AND ANALYSIS .....</b>	<b>12</b>
<b>SUMMARY .....</b>	<b>14</b>
<b>RECOMMENDATIONS.....</b>	<b>14</b>
ENDNOTES .....	17
BIBLIOGRAPHY .....	21



## AMMUNITION SHORTAGES EXPERIENCED IN OPERATION IRAQI FREEDOM – CAUSES AND SOLUTIONS

We can win without food, we cannot win without ammunition.

—General Walton “Bulldog” Walker, USA

In March of 2004, Secretary of Defense Donald Rumsfeld sent a memorandum to the then Acting Secretary of the Army Les Brownlee asking him to look into the shortages of small arms ammunition being experienced at the time by forces in Iraq. In his “snowflake”, Secretary Rumsfeld said the shortage of ammunition suggested that “some unfortunate decisions were made, and, further, that there may be some systemic problem”.<sup>1</sup> In response to the memorandum and in subsequent follow-ups, members of the Army staff have dug to find the answers to the Secretary of Defense’s questions as well as devise the solutions to the present problems which generated the memorandum.

This paper will use the small arms ammunition shortage as a start point as it examines the Department of Defense’s, and more closely, the Army’s ammunition management process. This examination will look into the possible reasons which led to the shortages experienced in Iraq, the requirements determination process, past procurements, inventory status, and what the Army did to fix the problem. The data and analysis in this effort suggests that the shortages in Operation Iraqi Freedom (OIF) were not a result of inadequate supplies but more likely a result of inadequate theater distribution and asset visibility. The research done provides a basis for recommendations that can help prevent shortages of small arms ammunition in the future.

During the spring and summer of 2004, reports and news articles began to surface that highlighted the ammunition problem in OIF. In one article it was noted that the Army estimated it would need 1.5 billion small arms rounds per year, which was three times the amount produced just three years earlier.<sup>2</sup> In another, it was noted by the Associated Press that soldiers were shooting bullets faster than they could be produced by the manufacturer.<sup>3</sup> It seems remarkable that the nation with the most sophisticated military could run out of bullets for its rifles and machine guns. Billions of dollars were used to develop the very technology that provided the United States military with that unprecedented capability, yet somehow it has fallen behind on the basic need for small arms bullets.<sup>4</sup>

The fact that some soldiers or units in Central Command’s area of responsibility (AOR) reported a shortage of ammunition indicates that a problem existed and that the Department of Defense and Army must face the problem and solve it.

The first imperative in solving a problem is correctly identifying its cause. Reports of ammunition shortages are an indicator for one of several problems that boil down to two different areas. First, there could be distribution problems in the theater. In this case, there are sufficient quantities of ammunition in the area to satisfy all requirements but the ammunition is not distributed adequately to address a specific requirement at a particular time. The other possibility is there simply are not enough munitions on hand to meet the demand of the theater. Another way to describe this possibility is to say more ammunition is being consumed that can be made.<sup>5</sup>

This discussion raises a particular term that needs to be expanded upon – that term being “consumed”. When examining the distribution and status of ammunition, “consumed” can convey many different meanings. To some, consumed means shot or fired by a weapon in combat. To others, it could mean what is issued to a soldier, or unit, regardless if it is used or not. Finally, to another group the consumed ammunition is the difference between what is issued and what is turned in by a soldier/unit when the mission is complete.<sup>6</sup> These three definitions have a profound impact on how one looks at the ammunition problem and perceives the shortage and possible solutions. In this paper, ammunition expended is considered “consumed”, but this amount by itself does not define what ammunition is needed by a force.

To determine the true nature of the problem the first area to be examined will be how the Army would have estimated the munition requirement for OIF. Looking back, perhaps some flaws in the methodology used to estimate the requirement would account for some of the shortages experienced.

## **DETERMINING REQUIREMENTS**

The Office of the Secretary of Defense along with the Chairman of the Joint Chiefs of Staff oversees the services as they determine their munition requirements. The process is influenced in part by the Strategic Planning Guidance that is issued by the Secretary of Defense. This guidance is used primarily for developing the force requirements for each service, but it also affects the services’ requirements for ammunition. As the Strategic Planning Guidance lies out the capabilities desired it indirectly influences the munitions required. On the other hand, the Department of Defense Instruction (DoDI) 3000.4 lays out in detail the framework the services use to determine their munition requirements.

The framework laid out in DoDI 3000.4 is fairly straightforward. The first part of the requirement each service must account for is the ammunition required by its forces for training.<sup>7</sup> This requirement is generally an annual requirement, and can change based on guidance from

leadership of the service, as well as force and equipment changes. Some of these requirements will be for ammunition only used in training and others will be for dual use ammunition. The new training requirements that the former Chief of Staff of the Army implemented after the terrorists' attack in September of 2001 and the additional training for deployed and mobilized units has significantly increased the amount of ammunition required for training, making previous estimates low.<sup>8</sup>

The next part of the requirement that each service determines is that required for its warfighting responsibilities. Currently, this is the estimate for each service to conduct operations to swiftly defeat an adversary in one theater while near simultaneously winning decisively in another theater.<sup>9</sup> It is up to each service to determine which theater/scenario to use for each of these cases, but the result provides the requirement for the most demanding case examined. In addition to the estimate of munitions expended to win in each theater, the requirements must also include a "residual capability" at the conclusion of hostilities.<sup>10</sup> In other words, after the war has been "won", systems must have some ammunition on hand. The instruction does not specify how much, but no ammunition would result in no residual capability.

Forces not committed to any major combat operation are labeled the strategic readiness reserve. The DoDI 3000.4 tasks each service to determine the ammunition requirements for these forces as well.<sup>11</sup> This is the third piece of the services' requirements. The last part is the estimate of munitions required for forces assigned to current operations and/or forward presence requirements. These force requirements are directed in the Defense Planning Guidance and each service's commitment is different. Additionally, some of these requirements for the current operations/forward presence can be included in another category if a service feels it is appropriate.<sup>12</sup>

Each service then uses these parts of their requirement to determine a war reserve and the total requirement. The war reserve requirement is the sum of the warfighting, strategic readiness reserve, and the current operations/forward presence pieces. In a perfect world, this amount of munitions would allow a service to fulfill all of its warfighting and Defense Planning Guidance mandated responsibilities throughout the world. When the training and testing requirement is added to this number, it represents the total munition requirement.<sup>13</sup> This total lays the groundwork for each service's Program Objective Memorandum (POM) submission and programming actions for procurement of these munitions.

On the surface, the DoDI 3000.4 seems to be very specific in laying out the framework for services to determine their munition requirements. This might be true, but it does not specify how services will go about their determination. In fact, each service has a different

methodology, different models, and different techniques. And in the Army's case, different types of munitions have different methodologies applied when estimating their particular requirement.<sup>14</sup>

Combat requirements for many munitions are based on results from combat models used to predict how the fight would unfold in a given theater. The forces, both enemy and friendly, and their actions are modeled using the plans and estimates of the combatant commander for that theater.<sup>15</sup> The modeling produces an estimate for munitions that are fired at acquired targets. Then, several factors are applied to account for typical threat systems and forces not portrayed in the model (such as logistics units) and other "fog of war" issues (such as munitions expended against suspected targets). Next, an estimate for the munitions needed to populate a theater's supply system is computed.<sup>16</sup> Finally, to comply with the DoDI 3000.4, an amount is added to provide the minimal combat capability at the conclusion of hostilities. In the past, this amount has been computed to be either one half or one full combat load for each system.<sup>17</sup> "Combat load" for these computations is generally defined as the amount of ammunition a weapon system could carry, to include organic ammunition carrying vehicles normally dedicated to this purpose. When these components of the combat requirement are added together, the largest contributor to the total for most direct fire systems is the combat load portion.<sup>18</sup>

Another way to look at this phenomenon is to consider an individual system (tank, infantry fighting vehicle, or TOW) in the fight. Unless that weapon is positioned at a critical place in the battle, it will probably not expend all of its ammunition. The vast majority of weapon systems would expend only a portion of their combat loads. A small number could expend all and yet others might not use any.

The modeling process described is only used to determine the combat requirements for a small number of munitions. Small arms ammunition requirements are not modeled at all, but their combat expenditures are estimated based on the expenditure of other modeled direct fire systems. This is done for every weapon system that would be in the theater, whether it is in a combat, combat support, or combat service support unit. The modified table of organizational equipment for every Army unit that has been designated for that campaign is used to determine the total weapon systems in the theater. The combat load is then calculated, and to that the estimate for ammunition expended in combat is added.<sup>19</sup>

The United States General Accounting Office (GAO) has been looking into how the Department of Defense and the services conduct the requirements determination process since 1994. In 2001, the GAO found that no target templates were being used by the services for some types of large identified targets.<sup>20</sup> The GAO also found that in some cases, the services

were using different munitions effectiveness data, which is used to determine how much of a munition is needed to produce the desired effect.<sup>21</sup> This information is under constant revision, and if not updated, can quickly result in different sets being used by different organizations. In both cases the Department of Defense and the Joints Chiefs of Staff corrected these deficiencies after the April 2001 report was produced.<sup>22</sup> In October of 2002, the GAO issued another report that identifies another deficient area of the requirements process which might pertain more to the shortage of small arms ammunition experienced in Iraq this year. This area deals with the time frame that is used for the Department of Defense (and services') requirement estimates.<sup>23</sup> Since the requirements will be used to determine procurement of munitions, they are determined for the future forces and capabilities to address anticipated scenarios. The requirements will be used to determine programs over the six program years. These budget years actually start two fiscal years after the budget is proposed.

This however is not the focus of the various combatant commanders. They have a much closer horizon and are focused on the near term needs for munitions in their theater. This difference in viewpoint often leads to a significant difference between the two estimates. As the DoD and service estimates are trying to work towards the future, the immediate needs of a theater could be overlooked and unaccounted for. The procurement of munitions for future systems while taking risk with present systems could contribute to near term shortages.

There are some details regarding small arms ammunition that have not been pointed out which might help explain why there appeared to be shortages in theater. Not all small arms rounds that are produced can be used in combat. For example, some rounds are blanks, and are only used for training. However, they are still produced on the same lines as lethal ammunition and account for a significant portion of yearly production. Also, within each caliber of munition there are several variants, labeled by Department of Defense Identification Codes (DODICs). Although DODICs are similar and generally interchangeable within each caliber, each is unique. Examples are armor piercing rounds and tracers, some are linked together, and others are packed differently.<sup>24</sup> This being the case, some unit commanders and soldiers prefer some types of ammunition over others. If the preferred munitions of one caliber are exhausted, one might say there is a shortage, when in fact more rounds for that caliber exist. This adds another level of complexity to producing as well as distributing small arms ammunition, for one has to decide on the mix of DODICs to produce and distribute. These nuances are not normally visible at the macro level of "ammunition shortages". One needs to burrow into the details to understand how those managing theater munitions see the problem.

So far two reasons have been discussed which would explain why the Iraqi theater experienced ammunition shortages. These included a possible distribution problem within the theater and simply not producing and supplying enough bullets to the theater. But there are more aspects to the problem which only add to the complexity and make the identification of the problem and determination of the solution more difficult. For instance, as explained earlier, the Army G3 uses estimates for warfighting and training requirements based on a certain force structure and associated equipment. For the combat requirements, certain scenarios are approved and used. If one aspect of the founding assumptions used for the scenario change, then the estimates are not as accurate. The operations in OIF are an example, a prolonged (multiyear) stabilization phase (Phase IV) was not considered when determining requirements.<sup>25</sup> Yet another factor which has come to light is the number of weapons being used in theater. As noted earlier, calculations for estimations are done using current modified table of equipment for identified units. When these quantities change, requirements for warfighting and training are affected. This happened during OIF II and OIF III rotations. As insurgency activities became the focus of combat and stabilization operations, units started requesting more machine guns for their units through operational need statements (ONS). To date, nearly 3000 M240 7.62mm machine guns, 1200 M249 5.56mm Squad Automatic Weapons (SAWs) and 700 M2 .50 caliber machine guns have been added to the theater.<sup>26</sup> These quantities are in addition to what the units are normally assigned. Obviously, this additional weaponry adds to the previous estimates for combat loading, expenditure, and training. As an example, the combat load for the extra M240 machine guns in Iraq alone increases by 1.8 million rounds.<sup>27</sup> The added yearly requirements for mobilization and training would be higher than the combat load.

#### **SUPPLY ISSUE**

If so much thought and energy goes into estimating the requirements for munitions (to include small caliber), how could our forces run short after a small campaign in Afghanistan and one year in Iraq? Certainly the United States, who has not been committed to any military action requiring soldiers to expend significant amounts of small arms ammunition since 1991 had some war reserve ammunition on hand to use for such a contingency. Perhaps this was not the case. Data from an Army G3 chart used to brief the Chief of Staff of the Army on 26 April 2004 entitled "Training Ammunition Requirements/Funding Trends" shows the unconstrained and validated training requirements from FY88 through FY11, as well as the funding levels for those years. In every single year the funded level is less than the validated requirement. Funding for Army munitions decreased sharply since 1989. In FY 88, the Army

spent \$3.4 billion for training and war reserve ammunition (this does not include missiles). Since then, the amount has decreased steadily until it leveled off in FY 93. Since then, the yearly programmed expenditures for ammunition have been somewhere between \$0.8 and \$1.3 billion.<sup>28</sup> The vast majority of this amount was only buying training ammunition, and very little war reserve munitions were being bought. Training ammunition buys were still inadequate, but training shortages were made up by pulling from the cold war stockpiles. On the surface all was well since the peace dividend was being realized and training requirements were being met. But the underlying truth was a dwindling war reserve and a reduction of the country's capability to produce munitions. The gap between required and funded ammunition rates is very evident starting in FY92 and continues through FY02. These dates roughly correspond to the end of the Cold War (realization of the peace dividend) and the ramp up following the terrorists' attacks of 2001.

The reduction in funding during these years also affected the United States' ammunition production capability resulting in a steady decline since the Cold War. Since 1989, there has been a 68% decrease in the capacity of the munitions industrial base. The number of facilities mirrors this decline. Government owned facilities fell from 28 to 13, and privately owned facilities decreased from 163 to 69.<sup>29</sup> The production of small arms ammunition has been consolidated in a single government owned facility at Lake City Army Ammunition Plant at Lake City, Missouri.<sup>30</sup>

This precipitous decline in training ammunition production indicates our soldiers were not training to standard or the training ammunition was coming from somewhere else. According to the Army G4 and others, the training shortfall was filled using the war reserve stocks. That was stated in the response to the Secretary of Defense's "snowflake" by the Secretary of the Army back in April of 2004.<sup>31</sup> But there were others who noticed this trend well before 2004.

In February 2002, the Institute of Land Warfare noted that the stockpiles of ammunition left over after the Cold War had been nearly depleted. The Army needs 80,000 tons of ammunition annually for training and qualifying but only buys 60,000 tons at a cost of \$700-800 million. By FY07, less than 10,000 tons per year will be available for training. That leaves a shortage of \$820 million over the next five years for training ammunition.<sup>32</sup> While inventories of small arms ammunition are not as affected as other munitions because of high turnover and long shelf life, other munition requirements must account for periodic inspection and refurbishment. The former deputy chief of staff for ammunition at the Army Materiel Command said in 2003 "It's safe to predict that by 2010, most of the ammo we have today will be unserviceable or of limited utility".<sup>33</sup>

## **REPLENISHMENT POLICY**

A problem area that confronts the DoD in conventional ammunition appears to be its lack of a replenishment policy. After all, the ammunition facilities that are being maintained are supposed to have the capacity to produce ammunition and replace what was used in operations. Currently, there is no definitive policy that this action is governed by. By default, the Army Material Command has been using the policy that has not been updated since the end of the cold war. This policy states that ammunition will be replenished within three years after the completion of combat operations. Along the same lines, DoD policy states that surge production of materiel and ammunition will not be used for operations. The concept is to maintain and use from adequate stockpiles for the conflict and use industrial capacity to replenish afterwards.<sup>34</sup>

The most important justification for retaining government owned facilities is the requirement to replenish ammunition consumed during operations.<sup>35</sup> However, this replenishment is intended to be a peace time activity conducted some time after conclusion of hostilities and is preparation for potential future conflicts.<sup>36</sup> This is in line with the current policy but it presumes adequate stockpiles on hand to supply any and all contingencies. The current situation is a surge production to fill an increase in demand. This is a wartime policy and not part of the national security policy.<sup>37</sup>

Keeping excess capability to replenish stockpiles requires funding. Maintaining and operating underutilized production lines, equipment and personnel is not efficient at peacetime rates.<sup>38</sup> Funds for ammunition facilities include costs for replenishment capability. Replenishment costs include the operation and maintenance of equipment used at 20% or less of capacity and "laid away" equipment only used for replenishment (or surge) production. Between these two categories, replenishment required \$137 million in FY03.<sup>39</sup> This funding requirement is only for government owned plants. Privately owned facilities are not required to keep excess capacity available.<sup>40</sup> Obviously this is a necessary funding requirement that DoD would like to minimize.

## **ATTEMPTS TO IMPROVE EFFICIENCY OF FACILITIES**

As the DoD Single Manager for Conventional Ammunition (SMCA) the Army has tried to improve the efficiency of the industrial base. In 1992, the Armament Retooling and Manufacturing Support (ARMS) act was passed which allows contractors in government-owned contractor-operated (GOCO) plants to lease the unused capabilities of their facilities to other commercial interests. This arrangement would entail a twenty five year lease to the contractor

and allows the contractor to keep some of the revenue generated by the lease. The remaining revenue must be used to improve or repair the property. The contractor operating the plant and the government negotiates these issues of revenue disbursement. This program was initiated to ensure the facility is maintained and upgraded while making use of idle capacity.<sup>41</sup>

In the early 1990's Congress also enacted legislation that permitted leasing authority for government-owned government-operated (GOGO) plants. The purpose of this law was along the same lines as the ARMS Act. It permits plant managers of government owned and operated facilities to lease excess capability to help reduce the ownership costs of the plants.<sup>42</sup> These efforts have been labeled as a "good news" story in the management of the munitions industrial base by a Pacific Northwest National Laboratory study in 1997.<sup>43</sup>

### **PRODUCTION ISSUE**

How badly was the United States postured, in terms of small arms ammunition, going into OIF? And where are we now? Regardless of the estimates before hostilities, or future production projections, the problem can be investigated by examining the small arms inventory before hostilities and now. For instance, in 2002, the Operational Support Command (OSC), which since has been renamed the Joint Munitions Command (JMC), reported the number of small arms (5.56mm, 7.62mm and .50 caliber) on hand as over 692 million rounds.<sup>44</sup> Although this data was dated July 2002, it still provides a reasonably accurate status of these munitions going into OIF eight months later. In an update to the Assistant Secretary of the Army on 27 April 2004, the small caliber inventory was about 694 million rounds. A relatively small amount, about 104 million, was in the Central Command's AOR. This only represents about 15% of the total available.<sup>45</sup> If these reports are accurate, it would appear the number of rounds in the inventory was basically the same between July 2002 and April 2004. That's after one year of conflict in Iraq. This does not indicate the Army is running out of small arms ammunition. And if 85% of the inventory is still available for use in Iraq and elsewhere, it would appear at least some war reserve is still available. This data only seems to support the idea that the shortages experienced in Central Command's AOR might be due more to distribution than supply availability.

### **ASSET VISIBILITY AND REPORTING**

There are some that are convinced that there is no actual shortage of ammunition in theater.<sup>46</sup> They believe enough has been shipped and is physically in theater, but it is just not in the right places. To understand how this might happen, it would be helpful to understand how the ammunition supply points are organized and the ammunition is distributed in Central

Command's AOR. Basically, all ammunition is shipped into theater through Kuwait. From there, it is further distributed to a number of ammunition supply or transfer points throughout Iraq and Afghanistan. If combat units in Iraq and Afghanistan "need" ammunition, they request it from Kuwait. There is no redistribution of ammunition conducted within Iraq or Afghanistan. The ammunition supply point in Kuwait fills the orders it can. When new units arrive or training requires more ammunition than on hand in Kuwait, the request is sent to HQDA for more. The problem seems to be no willingness or ability for cross leveling in theater, which could result in an abundance of ammunition in some supply points. In one case, a division in Iraq had enough ammunition for seven basic loads, yet the theater still claims shortages of ammunition.<sup>47</sup>

In a statement issued by Representative Curt Weldon during a House Subcommittee hearing on small caliber ammunition programs in June 2004, he pointed out that during the last year in Iraq only 72 million small caliber rounds were expended. It was also noted that 5.5 million rounds were being expended each month at that time. Later on in the statement, he points out that expenditures were only a small fraction (less than 10%) of the inventory and monthly expenditures are a small part of the monthly production capability. Given these expenditure levels, he fails to see why some defense officials are claiming there is a shortage of ammunition.<sup>48</sup>

In the same statement, Representative Weldon identifies an increase in the training requirement for small arms which was instituted by the former Army Chief of Staff after September 11, 2001. The new training requirement jumped up to 1.1 billion rounds per year.<sup>49</sup> This is up from about 440 million rounds.<sup>50</sup> Additionally, the training requirements do not just apply to the forces in the United States, but also to those deploying to the Central Command theater. All forces arriving in Kuwait are firing weapons as they go through a vigorous Joint Reception, Staging, and Onward Integration (JRSOI) process.<sup>51</sup>

Only by considering the training requirements along with the combat expenditures does the true magnitude of the problem come to light. But the congressman does not put the pieces together, for he only focuses on the expenditures in OIF and production, when in fact it is the training requirement for the forces not deployed that produces the most demands on the small arms production capabilities. In fact nearly 70% of the small caliber requirements for FY 05 are needed for training.<sup>52</sup>

## **WHAT WAS DONE**

To solve the short term problem of alleviating shortages of small arms ammunition in OIF, the Army has pursued direct buys of ammunition, increased production at its Lake City Army

Ammunition Plan, and initiated expanded contracts with commercial vendors.<sup>53</sup> This approach has come under criticism since some of the vendors being considered are from Israel, the United Kingdom, and Canada.<sup>54</sup> Although augmenting production from government owned facilities has historic precedents and seems reasonable, the concept has a key weakness which was detailed by Richard Palaschak, the Director of Operations of the Munitions Industrial Base Task Force. He said, "However, without some assurance of a return on their investment, even a modest investment would be a difficult decision for private industry when the government's proposed acquisition strategy offers no minimum annual production".<sup>55</sup>

The increase in production capacity and commercial contracts are being funded by FY03 supplemental funding.<sup>56</sup> Additionally, the Army has attempted to satisfy the AOR's request for ammunition by moving and shipping million of rounds from the existing inventory. Since March of 2004, over 225 million rounds of small arms ammunition have been shipped to Kuwait for OIF forces.<sup>57</sup>

The long term supply solution proposed production capacity at the Lake City plant at the rate of 1.2 billion rounds per year and commercial contracted production of 350 million rounds per year for a total base of 1.55 billion rounds. It also calls for increasing the capacity of both production facilities for a total capability of 2 billion rounds per year.<sup>58</sup> However, this surge capacity is intended to be used in times of war.<sup>59</sup> (See Figure 1)

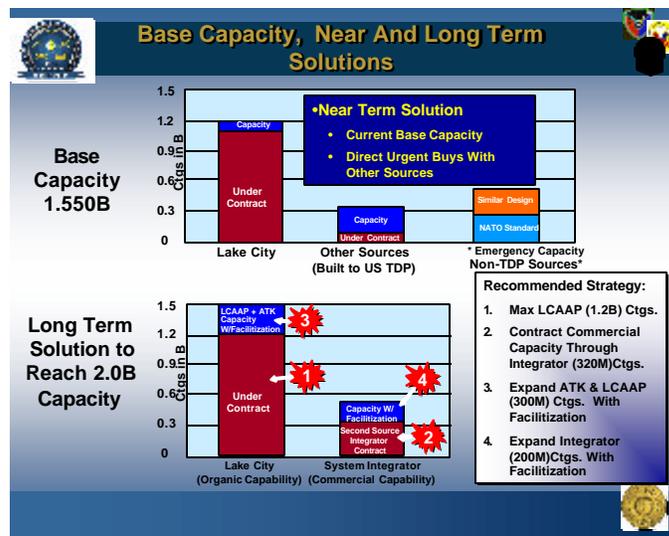


FIGURE 1

The reason for the 2 billion round capacity is not clear. Looking at the small caliber requirements analysis from the Army G3, for the FY05-11 timeframe, the largest requirement for any year is 1.752 billion rounds. To derive the yearly requirement, the war reserve, training and testing requirements, other service requirements, and an estimate for current operations was used. This analysis assumes the war reserve requirement is procured over the entire period at a rate of 126 million rounds per year.<sup>60</sup> And the total for each year will be reduced by the inventory of serviceable ammunition, which will reduce yearly requirements substantially when reserve levels are met.

On the surface, the problem of how much ammunition is needed for current operations in Iraq seems to be fairly easy to determine. If the theater reported the weekly or monthly expenditure through the established reporting system to HQDA, these could be used to determine a monthly requirement. Again, this depends on what definition of "expenditure" is used, but regardless this would provide some estimate. Another way would be to total all ammunition issued to a unit, subtract what the unit turns in when it redeploys, and divide by the number of months in theater. This would provide a monthly estimate for that type of unit. Unfortunately, all the reports and records that would allow HQDA to track use and anticipate shortages have not been used or maintained accurately with any level of confidence.<sup>61</sup> This has been the case since preparation for OIF commenced and continues today. A conference is being held in Kuwait to address this continuing problem while this paper is being written.<sup>62</sup>

If the requirements process can develop a usable, or believable, estimate of future needs, then adequate funding of war reserves would be enough to preclude surge production from existing facilities and the policy of replenishment would be sufficient to meet DoD's needs and policies. But if predicted requirements are wrong or the war reserve is under funded, then the system could be forced to surge during operations. "Under funding of war reserve stocks can place the nation in the position of resorting to a default national strategy of surging during operations".<sup>63</sup>

## **CONCLUSIONS AND ANALYSIS**

The shortages of ammunition experienced in OIF are not caused by a single event or failing. As pointed out, there are several factors, that when all occur and interact, result in the situation many agencies are working on to fix today. The research presented here leads one to see two problems that need to be addressed. One is a short term problem that needs to be and has been solved in order to satisfy the combatant commander's immediate needs – regardless of the underlying causes. The other is the long term problem of how the Army should go about

buying the ammunition it needs to continue training, provide for current operations in the war on terrorism, and provide a war reserve for contingency operations.

The part of the problem that was addressed with the Army's response was the short term problem. Ammunition was needed as fast as possible, so the Army made as much as fast as it could and bought from outside sources to make up the difference. The problem was addressed as if it was a supply issue only, and does not face all of the issues which lead to the problem in the first place. Now, the path forward is to use Lake City and commercial vendors to produce 1.55 billion rounds per year, with both manufacturers being funded to increase their capacity by almost 300 million for a total capacity of 2 billion rounds per year. Instead of paying for unused capacity in one facility, this solution proposed will pay for unused capacity in several.

The current long term solution does alleviate the problem of having only one facility producing small arm munitions, but it is not very efficient or cost effective. The reason no commercial contracts existed for small arms production was the inability of the government to guarantee long term contracts with any amount of certainty. The training requirement is almost constant for the foreseeable future. It also accounts for almost 75% of the total requirement of small arms munitions planned for procurement each year. Unless standards or the number of soldiers and weapons change drastically, the training piece of the requirement, or even some portion of it, provides a golden opportunity to attract commercial producers with substantial long term contracts for producing ammunition. Also, there is no reason to pay for the installation and maintenance of excess production capacity at Lake City and other locations. The government has already paid for excess capacity at Lake City and that should be the only surge capacity kept. Additionally, the equipment which is kept for extra capacity could be used as the base for production of the next generation of small arms munitions.

As seen throughout the examination of this problem, having enough ammunition in the inventory to meet all the predicted demands does not guarantee some soldier in some part of the world will not run out of ammunition. The distribution of this ammunition becomes a prime concern once it is produced, as the inability to deliver it to the right place at the right time will undermine the best procurement plan. The distribution of ammunition cannot be based solely on where soldiers and Marines are stationed, but must also take into account where they might operate. Currently, this ability to preposition and move large volumes of munitions for a theater's use seem to be adequate. The process of distribution within theater needs attention. As shown, supplying the theater with more ammunition ended with mixed results – some units had multiple basic loads on hand, while others requested more. Accurate reporting would help alleviate this problem by providing the critical visibility required to effectively manage these

assets. In very simple terms, higher headquarters cannot make sound, timely decisions without accurate information from subordinate units.

## **SUMMARY**

Several of the assumptions used in the requirements determination process might not have been valid – most notably the training requirements and number of weapon systems in theater. However, redistribution of available war reserve ammunition, and increased production and procurement of ammunition overcame these issues.

The past under funding of small arms ammunition and the resulting use of a withering war reserve for training requirements has resulted in two unfortunate situations the Army is dealing with now. First, it depleted the war reserve to the point where it might not be able to support contingency operations. Second, the decreased funding led to a sharp decline in the capacity of the United States' small arms ammunition production, both government and privately owned.

Of all the possible causes of the OIF ammunition shortages examined, it appears the lack of asset visibility in theater and the resulting inability to effectively manage and distribute available ammunition is the most likely cause.

## **RECOMMENDATIONS**

A simple solution that provides an incentive for commercial United States small arms production would be to contract for 700 or 800 million rounds per year from commercial sources for five or ten years. That leaves around 800 to 900 million rounds to be produced by Alliant Tech at Lake City. When the war reserve is restored, or current operational requirements decrease, the resulting decrease in demand will be absorbed as excess capacity at Lake City, and it will not impact the commercial sector. This scenario assumes funding of the requirement. If full funding does not occur, the percentage of the training ammunition being produced by commercial vendors should remain the same since training ammunition is always needed and produced. The government owned plant would decrease production and just add to its excess capacity.

With supplies of all types, the ability to anticipate and be proactive in solving potential issues requires some visibility of that supply's use and status. The systems are in place to send this information forward in the ammunition community, but they are not being effectively used. This failure has to be corrected. The fact that a conference is being held in Kuwait to address the problem of ammunition reporting, after nearly two years in theater, is a sad testament to how this issue has been handled. Accurate, timely reporting will result in better visibility and distribution of assets.

Despite the conclusion of this study that the primary problem causing the theater shortage of ammunition is only marginally a requirement determination problem, and most certainly not a production problem, senior Army leaders took the appropriate action to correct the near term shortcomings they found in the Army's Title 10 responsibilities. Now it is time to turn our attention to the tougher challenge of instilling a sense of discipline in the theater to address inventory accountability, asset visibility, and accurate reporting of ammunition consumption.

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## ENDNOTES

<sup>1</sup> Secretary of Defense Donald Rumsfeld, "Shortage of Ammunition," memorandum for Les Brownlee, Gen. Pete Schoomaker, Washington, D.C., 31 March 2004.

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<sup>3</sup> Ed Offley, "Rumsfeld's Strange Remarks," 26 July 2004; available from <[http://www.military.com/NewContent/0,13190,Defensewatch\\_072604\\_Offley,00.html](http://www.military.com/NewContent/0,13190,Defensewatch_072604_Offley,00.html)>; Internet; accessed 19 October 2004.

<sup>4</sup> Merle, 1.

<sup>5</sup> Ibid.

<sup>6</sup> Mr. Joseph Jenkins, G3 Ammo Management Office, interview by author, 28 January, 2005, Washington, D.C.

<sup>7</sup> Department of Defense, *DoD Munitions Requirement Process (DoD MRP)*, Department of Defense Instruction 3000.4 (Washington, D.C.: U.S. Department of Defense, 23 October 2003), 11.

<sup>8</sup> Acting Secretary of the Army, R. L. Brownlee, "Shortage of Ammunition," memorandum for Secretary of Defense, Washington, D.C., 8 April 2004.

<sup>9</sup> Department of Defense, 10.

<sup>10</sup> Ibid., 11.

<sup>11</sup> Ibid., 10.

<sup>12</sup> Ibid., 11.

<sup>13</sup> LTC David Fralen, "CAA's Campaign Analysis and Requirements Estimation Process," briefing slides with scripted commentary, Fort Belvoir, Center for Army Analysis, 19 December 2004.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> Jenkins.

<sup>18</sup> LTC David Fralen.

<sup>19</sup> Ibid.

<sup>20</sup> General Accounting Office, *Defense Logistics: Report to the Chairman, Subcommittee on Readiness and Management Support, Committee on Armed Services, U.S. Senate* (Washington D.C.: U.S. General Accounting Office, April 2001), 12.

<sup>21</sup> Ibid.

<sup>22</sup> Jenkins.

<sup>23</sup> General Accounting Office. *Defense Management: Report to the Secretary of Defense* (Washington D.C.: U.S. General Accounting Office, October 2002), 2.

<sup>24</sup> Operations Support Command, *State of the Ammunition Stockpile*, Report 1-02 (Rock Island, IL.: U.S. Army Operations Support Command, July 2002), 13.

<sup>25</sup> Jenkins.

<sup>26</sup> Mr. Glenn Hulse, G8 Force Development Directorate, interview by author, 28 January 2005, Washington, D.C.

<sup>27</sup> Jenkins.

<sup>28</sup> Ibid.

<sup>29</sup> Daniel Goure, "Supplying Ammunition, the Lifeblood of the Military," 17 November 2004; available from <<http://www.lexingtoninstitute.org/defense/SupplyingAmmo.pdf>>; Internet; accessed 15 December 2004.

<sup>30</sup> Ibid.

<sup>31</sup> Brownlee.

<sup>32</sup> Steven Mullen, "Ammunition Readiness: Current Problems and Future Implications for Army Transformation," *Landpower Essay 02-1* (February 2002); 3.

<sup>33</sup> Sandra I. Erwin, "Army Not Producing Enough Ammunition," May 2003; available from <<http://www.nationaldefensemagazine.org/article.cfm?id=1100>>; Internet; accessed 19 October 2004.

<sup>34</sup> W. Michael Hix, et al., *Rethinking Governance of the Army's Arsenal and Ammunition Plants* (Santa Monica, California: Rand, 2003), 46.

<sup>35</sup> Ibid., 189.

<sup>36</sup> Ibid., 190.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid., 47.

<sup>39</sup> Ibid.

<sup>40</sup> Ibid., 194.

<sup>41</sup> Ibid., 48.

<sup>42</sup> Ibid., 49.

<sup>43</sup> T. J. Doherty, R. E. Rhoads, PNNL Program Management, *Recommended Strategy for Configuring and Managing the U.S. Munitions Industrial Base* (Richland, Washington: Pacific Northwest National Lab, 1997), 14.

<sup>44</sup> Operations Support Command, 13-14.

<sup>45</sup> Bobby Ransom, "Small Caliber Ammunition Update to A/SA," briefing slides, Washington, D.C., Army G8 Force Development Directorate, 27 April 2004.

<sup>46</sup> LTC Susan P. Carlson <Susan.Carlson@us.army.mil>, "RE: Ammunition," electronic mail message to Dean Mengel <dean.mengel@carlisle.army.mil>, 8 December 2004.

<sup>47</sup> LTC Jamie Markol, G3 Ammo Management Office, interview by author, 28 January 2005, Washington, D.C.

<sup>48</sup> Congress, House of Representatives, Committee on Armed Services, Subcommittee on Tactical Air and Land Forces, *Small Caliber Ammunition Programs and the Associated Industrial Base*, 108<sup>th</sup> Cong., 2d sess., 24 June 2004, 2.

<sup>49</sup> Ibid.

<sup>50</sup> Operations Support Command, 13-14.

<sup>51</sup> Markol.

<sup>52</sup> Jenkins.

<sup>53</sup> William Sanville, "Small Caliber Sourcing Strategy," briefing slides, Picatinny Arsenal, Project Manager for Maneuver Ammunition Systems, 19 April 2004.

<sup>54</sup> Katherine McIntire Peters, "Biting the Bullet," 15 July 2004; available from <[http://www.gov\\_exec.com/features/0704-15/0704-15newsanalysis1.htm](http://www.gov_exec.com/features/0704-15/0704-15newsanalysis1.htm)>; Internet; accessed 6 February 2005.

<sup>55</sup> Congress, 5.

<sup>56</sup> Acting Under Secretary of Defense (Acquisition, Technology & Logistics), Michael W. Wynne, "Ammunition Shortage," memorandum for Secretary of Defense, Washington, D.C., 14 May 2004.

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<sup>58</sup> Sanville.

<sup>59</sup> Wynne.

<sup>60</sup> Jenkins.

<sup>61</sup> Ibid.

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