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AN INTELLIGENT APPROACH TO THEATER BALLISTIC MISSILE ATTACK OPERATIONS

I. Introduction.

In a relatively short span of time, the theater ballistic missile (TBM) threat has grown from a well-know but largely tactical threat to a major politico-military problem. Theater missiles have been in existence for many years, but during the cold war era the only non-NATO country with a viable capability was the Soviet Union. Having operational intercontinental ballistic missiles, the Soviets used their Scud missiles primarily as battlefield support weapons. Equipped with either chemical or high explosive warheads, the missiles were a recognized threat, all of which was minimal in the context of the vast European East-West conflict. Today, however, TBM's have achieved a new dimension in the hands of hostile or unstable third world nations, many of which are developing nuclear, biological, and chemical (NBC) capabilities for which the Scud and other such missiles are an acceptable delivery vehicle.

For many third-world nations, the TBM's substitute for the intercontinental capabilities of the two cold war superpowers. With likely opponents at their borders, the TBM armed with NBC allows even a relatively weak nation to exert powerful political and economic influence far out of proportion to its strength in other respects. As was seen during the recent Gulf War, the Scud can be more important as a political weapon than a military one. Influencing other nations to act in a way that affects the conflict results from a weapon far out of proportion to its purely destructive force. From a political perspective, possession of a TBM force allows a country enhanced peacetime influence in regional and global affairs. Furthermore, in a conflict

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environment, the likelihood of TBM operations can encourage or discourage nations from participating. Possession of an NBC-equipped TBM force allows an otherwise militarily inferior country to threaten use in order to obtain, for example, an acceptable cease-fire agreement, thus avoiding the penalties of a lost cause. This capability may encourage military adventures, with the aggressor secure in the knowledge that, even in the case of defeat, a final adverse reckoning probably will not occur.

In a purely military sense, TBM operations may affect the enemy tempo of operations and wreak havoc on resupply or other rear-area support operations. Finally, there are very good economic reasons for a nation to pursue development of a TBM force. The effects of a large number of conventional weapons may be replaced with a small and relatively inexpensive TBM force. For example, may third world nations practically bankrupt themselves in trying to equip and maintain first-rate air forces. These air forces are in many cases of questionable value, especially when considering maintenance or operational readiness of personnel. Against a superpower such as the US, they are almost assured of negation in short order. A TBM force, not tied to a large operating base, is more survivable and cost effective than a conventional air force. Acknowledging of course, the targeting limitations of specific types of missiles.

II. Current TMD Focus - Advantages and Shortfalls.

Given all the above factors and the likelihood that the US will again face an opponent armed with a significant TBM force, a great deal of time, money, and effort has gone into solving the Theater Missile Defense (TMD) problem. At this time, there are three pillars comprising TMD:

active defense, passive defense, and attack operations. Active defense addresses the efforts to engage and shoot down a missile once it has been launched. Passive defense incorporates warning personnel in threatened areas prior to missile impact. Attack operations are those conducted to find and destroy TBM elements on the ground. In addition to these three pillars, the underlying Ballistic Missile Command, Control, Communications, Computers, and Intelligence (BMC^4I) infrastructure enables the other pillars to be expeditiously and accurately conducted.

Active defense thus far has received the lion's share of public attention and funding. To some extent, justifiably so. During the Gulf War, active defense was the only activity that produced concrete results in the form of Scud missile kills. Consequently, efforts to continue upgrading our active defense capabilities should definitely be supported. However, because of the past emphasis place on active defense, other pillars such as attack operations have been overshadowed. Most importantly, however, although some attack operations tests have been conducted, with a few notable exceptions, most of these test programs are narrowly focused and do not address the full spectrum of attack operations.

There are many shortfalls to the current approach to TBM operations. Overreliance on the active defense pillar to the partial exclusion of the other pillars has some distinct drawbacks. One obvious major drawback is that it is essentially a reactive and not a proactive approach. In waiting for a missile to shoot down, we leave the initiative to the enemy as to the time, place, and weight of attack. With the ranges of TBM's continually increasing, we may not have the luxury of having systems (such as Patriot or Theater High Altitude Area Defense [THAAD]) in position

to protect potential targets. Additionally, maneuvering warheads and other technically feasible countermeasures may degrade current capabilities. Total reliance on active defense also means that we are unable to attrit the threat before it becomes an immediate defense problem. As a result, the active defense assets may be oversstaturated by enemy TBM surge operations. Another consideration is that over time even third world enemies may develop jamming capabilities, or other methods that may degrade our ability to detect and target missiles in flight. A total reliance on active defense in this instance means no effective defense at all.

Attack operations are an alternative method by which TBM elements can be destroyed. However, it appears that most of the thinking regarding attack operations has been developed from and to some extent limited by active defense methods of operation. The most glaring example of this is the almost hypnotic focus on the actual launch of the missile. Obviously, for active defense measures, the launch is the initial point at which active defense assets can detect and subsequently destroy the missile in flight. However, emerging operational concepts for attack operations have also focused on the launch itself and to some extent is unwarranted. Granted, the launch of a TBM certainly gives a confirmed area where TBM's are operating, but a single-minded approach that limits us to reactionary, post-launch efforts (most of the time geared toward destroying individual transporter erector launchers [TEL's]) fails to address the potential of well-conducted attack operations. It indicates a lack of thought regarding what attack operations are really meant to accomplish, what potentially can be achieved through the integration of intelligence and operational planning, and results in the inefficient application of available airpower.

Most telling however, is the fact that TBM elements are most visible at the time of the launch and any enemy is quite aware of this. Because current blue force attacks are overly dependent on launches, time-critical attacks are generated *at a time when opposing TBM forces suspect or know they are being looked at.* Within a short amount of time after launch, it is only reasonable to assume that an intelligent enemy will be trying to conceal himself from attack. By the time blue forces can arrive in the vicinity of a launch, they are faced with a paradox. While knowing enemy TMB forces are in the area and these narrowing the scope of the search, attack assets are even less likely to find and destroy individual vehicles than normal because of the camouflage, concealment, and deception (CC&D) measures conducted by a self-conscious opponent. It should also be remembered that with TBM operations, except in very unusual circumstances, the enemy has the initiative regarding when, where, and at what force level attacks will take place. Therefore, secure sites an intelligently selected distance from the launch point can be expected to be prepared in advance. Launch vehicles will move quickly after missile launch to reduce the possibility of detection and destruction.

III. Approaches to Attack Operations.

As discussed above, time-critical attacks based primarily upon launch detects has been the modus operandi for most US attack operations thinking to date. However, time-critical attacks are only half of the potential solution. More can be done both for preplanned and time-critical attacks as will be outlined below.

a. Preplanned/Deferred Gratification Operations. As the title suggests, these are targets that would be built into an Air Tasking Order (ATO) for the next day's operations. These operations can be geared toward reconnaissance or strikes but to a far greater degree than time-critical attacks, are very dependent on focused intelligence analysis (i.e., *Actionable Intelligence* - see detailed section below). A well thought-out operational plan of attack will, rather than being reactionary, force the opponent to modify his launch plans as a result of air operations. Many of these preplanned operations can be termed "deferred gratification" operations because the results of these efforts many not be immediately observable or even detectable. For example, it may be difficult to tell if preplanned strikes have truly disrupted a planned launch cycle or whether a hiatus or reduction in launch activity was already planned by an opponent. Additionally, as in the case of road mining, destruction of TBM elements may not occur until hours or days after the strike, depending on the circumstances and tempo of TBM operations. Depending on the scale of conflict and time involved, much of the initial work required may have to be prepared in advance of the conflict due to the sensor and analytical workload that increases in the middle of a war. In effect, reducing the baseline research capability necessary for proper preplanning. Preplanned operations, properly conducted, give the commander a wide array of options as to how to conduct the anti-TBM campaign. Unlike time-critical attacks whose only goal is to destroy TBM launch forces in the field, the ability to prosecute preplanned attacks gives the commander the option to pursue any one of a number of goals, some of which will subsequently aid time-critical attacks. These goals include but are not necessarily limited to: disrupting the TBM tempo of operations, destruction of forward bases or individual launch elements,

channelization of TBM assets into areas we desire for subsequent attack operations, and forcing the opponent to use a less than optimum plan due to the weight of attack.

(1) Preplanned Reconnaissance. To make the most effective use of available reconnaissance sensors, (many of which have limited fields of view at high resolution) the most likely areas of TBM operations should, to the extent possible, be identified in advance. Thus when a potential crisis evolves into an actual shooting war, the probability of detecting and identifying TBM launch and support elements improves with a focused collection effort.

(2) Preplanned Surveillance Missions. As opposed to reconnaissance tasking, preplanned surveillance includes the identification of suitable areas for tasking and insertion of unattended ground sensors or special operations forces whose primary purpose is to detect, identify, and report TBM assets for subsequent attack. Depending on the type of sensor used, these operations will require differing lead times. In the case of air-droppable unattended ground sensors, missions would be incorporated into the ATO as part of the interdiction effort while sensors requiring hand-emplacement would require more extensive planning and time. Insofar as attack operations are concerned, contact reports generated by these surveillance activities can be used to generate immediate time-critical attacks on vehicles or activities detected. If additional confirmation is desired, these detections can be used to task another reconnaissance sensor for immediate collection. The advantage of this approach to contact reporting is that opposing TBM forces are unaware they are being watched until attack forces arrive in the area, as opposed to the immediate post-launch period when they are quite aware. Used in another way, immediate attacks may be deferred in favor of further surveillance to determine TBM patterns of movement.

A series of detections may allow analysts to make judgments regarding the relationship of the launch areas to support bases so that these facilities can be pinpointed and subjected to attacks, the results of which may have far more of a lasting impact than individual vehicle destruction.

(3) Interdiction and Fixed-Site Destruction. These attack operations, built into the ATO, include road mining of key lines of communication for TBM operations, destruction of nonbypassable key bridges, and attacks on in-field TBM support sites following identification from reconnaissance assets. In the case of road interdiction, depending on the amount and quality of intelligence analysis conducted, these operations may be implemented prior to a contact report in a preplanned way based on the knowledge that TBM elements must or probably will use certain lines of communication to get from launch points to in-field support areas and bases. Attacks on in-field support sites, where possible, will likely cause the most long-term disruption in TBM operations. These forward support bases house the resupply missiles and support vehicles necessary for a sustained TBM campaign. However, these types of facilities can only be identified when a merger of focused reconnaissance and analysis takes place, since likely areas for support bases must be pre-identified for reconnaissance tasking. Even more importantly however, in-field support sites used in wartime may in fact be facilities devoted to other uses in peacetime, the only requirements being the ability to store resupply missiles, access to lines of communication, and perhaps a certain amount of covered storage for vehicles. Even where available imagery may contain an in-field support base, the essential identification as to the true purpose of this otherwise innocuous facility is dependent upon experienced analysts that are familiar with TBM operations and equipment, knowledge of the target country infrastructure, and ability to differentiate normal from abnormal patterns of movement or activity. Only then

can a positive identification be made and the facility placed on a target list or selected for immediate strike.

b. Time-Critical Targeting (TCT). As stated above, much effort has already been devoted to attacking TBM elements in the field immediately following launch, with the launch itself providing the contact report. Depending on the amount of baseline research and analysis already conducted, the operational commander may pursue a variety of courses. High resolution sensor platforms may be dispatched to the area to acquire and positively identify the TEL. If an attack is to be conducted immediately, aircraft may be dispatched with the goal of finding and destroying the TEL itself, sowing mines in the immediate area along the lines of communication, i.e., those that the TEL is currently traveling on or may have to use later for resupply purposes or destroying key bridges with the same intent. Due to the immediacy of these attacks, the latter option requires that key LOC points and bridges be identified and coordinates known in advance. Although post-launch TBM attacks may be successful, overreliance on this approach also means that, even when successful, a TEL that is destroyed is almost certainly bereft of a missile having in most cases just launched it.

IV. The Role of Intelligence.

All of the above operations, especially preplanned strikes, are heavily dependent on intelligence reconnaissance and analysis for success. For any given country, much of this work must be accomplished in advance for the best possibility of success. As was seen during the Gulf War, when ground, air, and naval forces are all engaged in an actual shooting war, competition

for available reconnaissance assets increases dramatically and thereby reduces the availability of a large amount of imagery for the TMD task. This is due to the need for imagery to support prestrike planning, post-strike battle damage assessment (BDA), current ground situation awareness, and other necessary time-critical mission essential tasks. During peacetime, many of these factors do not exist and therefore do not interfere with available reconnaissance opportunities, although a certain priority must be given to achieve collection in any given area of interest even in peacetime. Even more important however, is the fact that in the middle of a shooting war, available intelligence analysts are likely engaged full time fighting daily fires, and in all probability do not have the time to conduct an in-depth and necessarily time consuming background study of the type required. Add to this the fact that since the Gulf War, our pool of qualified analysts has declined and the likelihood that most of the available military analyst in theater will not have solid TBM backgrounds or knowledge of the steps necessary to achieve the goal will only exacerbate the problem.

a. Actionable Intelligence. The essential goal for intelligence in countering TBM operations it to take an initially large geographic area in which it appears TBM elements may operate and reduce this area to individual locations where these elements are actually or probably situated. This represents actionable intelligence in the sense that further reconnaissance or attack operations can be conducted as an immediate result of the intelligence process. The process starts with a mass of intelligence and country data available in peacetime and progresses through a series of steps that flows hand-in-hand through the peacetime, crisis, and hostilities phases. This can be visualized as an upside-down wedding cake as certain areas are eliminated and attack operations focus in on key TBM areas of operation.

(1) Peacetime Efforts. In peacetime, or at the very latest, crisis phase, it is essential that an Intelligence Preparation of the Battlespace (IPB) focused on TBM be conducted for each potential threat region. Only through this step-by-step process can likely TBM areas of operation and potential targets be identified in advance. The IPB is to be further prosecuted in the crisis and hostilities phases. According to the Army Field Manual FM 34-130, IPB is a systematic and continuous process of analyzing the enemy, weather, and terrain in a specific geographic region. IPB is nothing new for Army personnel, however, Air Force and Navy personnel may be unfamiliar with this process because the purpose for most IPB development is preparation for large-scale ground force operations. In a typical IPB effort, various templates, including situational, doctrinal, ground event, and others are produced to support the ground campaign. However, since TBM operations are unique compared to other ground maneuver forces and the targeted elements are more individual in nature, a TBM-specific process must take place even though existing IPB information is used. The goals of this peacetime TBM IPB effort are to determine first the likely areas of TBM operations and then, within these areas, identify potential wartime TBM field support sites, hide or launch sites, mineable sections and bridges along key lines of communications for TBM operations, and good locations for the placement of ground sensors. The product of this IPB process is a TBM template, the areas and targets of which are depicted in hardcopy or preferably an intelligence data base for graphic display and quick information retrieval.

The IPB process begins with an evaluation of the threat, including the capabilities and limitations of available TBM's, operational doctrine of the host country, and equipment related

factors. Incorporated into this evaluation is an evaluation of threat country intentions, to include political, military, and economic objectives from which it may be possible to determine the likely friendly targets of attack. With these evaluations in hand, an initial template can be developed that shows the area within which the opponent can conduct operations and still be within range of the intended targets. Once this has been accomplished, analysis of terrain and weather within this area including ground slope, elevation, vegetation, seasonal variances, and other pieces of data can, in conjunction with the threat data, help focus the likely areas of TBM operations. Within each of these likely TBM operating areas, imagery can be obtained and searched to accomplish the goals stated above. However, this final step requires that imagery for all portions of anticipated TBM operations be available. In reality, imagery of the entire threat country should be available since 1) Depending on the threat country, terrain, and weather may not limit TBM operating areas to a considerable degree 2) The identified TBM operating areas may prove to be wrong in wartime, necessitating a rapid refocus on the areas where launches are occurring, thus requiring imagery and 3) Having imagery of the entire country beforehand means a graphical template in either hardcopy or softcopy form can be prepared in advance and overlaid on a map base to instantly associate any piece of terrain with an individual image or images. The purpose for this imagery template would be to provide baseline reference images for area and fixed point study, not the current battle situation, and therefore current collection would not be required for this purpose. Additionally, as hostilities progress, this quick retrieval capability would allow analysts to compare newly acquired wartime imagery with peacetime to note differences, look at suspected areas of TBM operations before tasking new collection, and quickly respond to imagery request that do not require new collection, such as information on an industrial facility or other relatively unchanging ground target set. As indicated in preceding

paragraphs, this requirement for imagery is one reason why it is imperative that the IPB be done prior to hostilities, since it is unlikely that imagery, if not already available, can be acquired in the amount required, catalogued, added to an imagery template, and searched in its totality by analysts during the actual shooting war.

(2) Crisis. Provided that the above efforts have been conducted and the resulting template is in hand, when a crisis arises in the region, available reconnaissance assets can be focused in on the likely TBM areas and potential targets, rather than having to attempt to search the entire country, an impossible task in any case. In those cases where actual TBM elements are confirmed present, these locations and associated lines of communication targets can be fed into a target list or further information gathered.

(3) Hostilities. During the actual hostilities phase, all the activities of the crisis phase take place with the addition that launch events are being conducted and intelligence analysts have focused areas within which to modify the TBM template. It should be remembered that IPB is a process and the same processes used in the development of the template are used in focusing efforts for the newly revealed TBM operating areas if these prove to be different from those anticipated.

b. Application. All of the efforts described above are designed to assist operational personnel in conducting attacks against TBM elements. The identification of specific areas and points, graphically displayed and immediately accessible for preplanned or time-critical attacks, is the intelligence task. The specific manner with which elements are dealt with is essentially an

operational decision based upon available resources and other intelligence information which may have an impact on whether a target is attacked immediately in a time-critical fashion, placed on a target list for the next day's ATO, or further reconnaissance tasked for a variety of reasons. All of these options are discussed in section III and the reader is encouraged to revisit the issue based on the above process.