

THE ROLE OF AIRSTRIKES
IN ATTAINING US OBJECTIVES IN NORTH VIETNAM

FINDINGS AND RECOMMENDATIONS

Completed

Findings

1. The bombing of North Vietnam under the ground rules and at the force levels which applied in 1965 ^{has obviously not achieved} ~~made little contribution toward the attainment~~ of its major objectives -- reduction of the flow of supplies to the insurgent forces in the South and the forcing of Hanoi to enter into negotiations. Although the movement of men and supplies into North Vietnam has been hampered and made somewhat more costly, the Communists have been able to increase the flow of supplies and manpower to South Vietnam. The attacks, moreover, have had no discernible ^{impact on} Hanoi's determination to continue its policy of supporting the insurgency in the South. ^{appears as from as ever.} As a manifestation of US support and positive action in behalf of South Vietnam, the Rolling Thunder program has successfully attained its third objective -- bolstering the confidence and morale of the South Vietnamese, ~~and demonstrating to other friendly Southeast Asian countries the reliability of US commitments.~~

2. Even if the weight of attack were to be substantially increased, it is estimated that a continuation of the bombing under the ground rules which applied in 1965, and which are currently being followed, would ^{show no effect} ~~result in a virtually ineffective program.~~ ^{not a change in}

3. Air attacks almost certainly cannot bring about a meaningful reduction in the current level at which essential supplies and men

NSA, JCS reviews completed

flow into South Vietnam. Air attacks can, however, increase significantly the costs and difficulties associated with North Vietnam's support of the Communist forces in the South, complicate (greatly) the problem of maintaining essential economic activity in the North, and thereby bring (meaningful) pressures on the Hanoi regime. Therefore, it is concluded that, under drastically revised ground rules, particularly through the removal of limitations on geographic areas which can be taken under attack, and with a significant revision of the target systems selected and the manner in which they are attacked, airstrikes against North Vietnam could play an important role in achieving US objectives.

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4. (The effectiveness of air attacks in reducing the flow of supplies to a critical point is in large measure dependent on the course of ground combat in the South. Military action in South Vietnam against the Viet Cong and the regular units of the North Vietnamese army, on the one hand and the neutralization of their support facilities in North Vietnam on the other are complementary measures. Therefore, escalating the level of combat in South Vietnam is of major importance. The result would be substantially increased requirements for supplies from external sources to sustain the insurgency. [If the Communist forces could be deprived of access to sources of supply within South Vietnam,] these [requirements] could be increased to the point where [the capacity of Communist overland supply routes would be tested and] the costs of furnishing logistic support to the insurgent forces could be sharply boosted.

a fraction of ~~can~~ local (S'V/N) sources of supply (can be done).

5. The choice of alternative target systems which might be attacked is limited. Neutralizations of many of the target choices would have no direct impact on the course of the war since few of North Vietnam's military and economic resources are directly committed to the effort. An additional and fairly severe limitation on the choice of target systems results from the early stage of escalation in the present conflict. Without a declaration of war or a much higher degree of escalation, resort to unrestricted aerial warfare, including mass attacks on populated areas, does not appear to be a possible course of action at this time.

Recommendations] *Emphasize this =*

reference
1. The US ground rules under which the air campaign against North Vietnam is waged should undergo drastic revision in order to enable conventional airstrikes to make a meaningful contribution to the achievement of the major US objectives.

2. ^{A new} The emphasis in air attacks should be ^{placed on} ~~diverted away~~ from the current ~~(low yield)~~ targets in the southern regions of North Vietnam and ~~toward~~ neutralization of military-related targets in the northern part of the country. However, continued harassment of traffic movements in the southern regions on a more limited scale would contribute to the achievement of the overall objectives.

3. The recommended program of air attacks ~~designed to~~ optimize the ~~furthering~~ of these objectives at this stage of the war in South Vietnam would include the following targets. In combination, these attacks ^{are} ~~are~~ clearly ^{directed} ~~identified as~~ against military or militarily related targets.

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is
They are neither directed at nor expected to bring about the collapse
ORV
of the regime. *It wd. cause...*

a. First, the neutralization of petroleum storage (POL) facilities and the Haiphong cement plant. This should be done as quickly as possible to maximize effectiveness and prevent the North Vietnamese from taking countermeasures. The result would be to present the Communists with a major problem of military and economic supply, to complicate essential reconstruction, and to increase import requirements significantly.

b. The neutralization of selected military barracks and supply facilities if reconnaissance shows them to be in active use. Again, the attack should be carried out as quickly as possible since these facilities will probably be abandoned after the first strike.

c. Following neutralization of these facilities, the interdiction of the ports by mining, to throw the burden of military and economic supply primarily onto the rail lines, which probably would be able to handle all import requirements. *into coastal + inland w/way*
(Increased use of coastal and inland waterways and highways would be forced to help cope with the supply problem, and would in themselves begin to present more lucrative traffic targets.)

d. Following the mining of the ports, the concentration of bombing attacks on the China-North Vietnam LOC's,

particularly the key rail targets. This effort, including 24-hour armed reconnaissance against rail, highway, and coastal and inland water traffic, should begin to bite into the essential traffic flows needed to keep the economy functioning normally. The cost of maintaining a flow of military-economic supplies would be very greatly raised over current levels.

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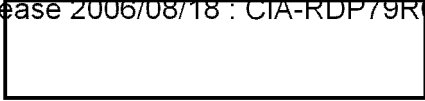
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THE ROLE OF AIRSTRIKES
IN ATTAINING US OBJECTIVES
IN NORTH VIETNAM

Summary Text

This report presents an analysis of the Rolling Thunder air offensive against North Vietnam, estimates the physical damage and human casualties resulting from the air campaign, and analyzes the US/GVN air operations employed to obtain these effects. Finally, the report evaluates the potential of air attacks as a weapon to achieve the stated objectives of the Rolling Thunder program, and recommends alternative courses of action which we believe to be more promising ways of achieving the Rolling Thunder objectives. For comparison purposes, we also present some capsule evaluations of US experience gained from the air wars against Japan, Germany, and North Korea.





I. Objectives of the Rolling Thunder Program

The Rolling Thunder program, a systematic but restrained air offensive against selected economic and military targets in North Vietnam, was begun on 2 March 1965. The basic objectives of the air attacks on North Vietnam have been made clear in public statements by the President and other high officials of the US government. These objectives are (a) to reduce the ability of North Vietnam to support the Communist insurgencies in South Vietnam and Laos; (b) to increase progressively the pressure on North Vietnam to the point where the regime would decide it was too costly to continue directing and supporting the insurgency in the South; and (c) to bolster the confidence and morale of the South Vietnamese.

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II. The Logistics Target System*

North Vietnam's major contribution to the war in the South is its function as control center for the insurgency and the logistic funnel through which men and material are ~~infiltrated~~ into South Vietnam. Consequently the attainment of the first objective of Rolling Thunder hinges almost exclusively on our ability to impede or to stop the flow of men and supplies from North Vietnam to South Vietnam, ~~or to exact an increasingly high price for sustaining the logistic effort.~~ The

* See Appendix A.



[REDACTED]

logistic target system which must be attacked to meet this objective is of such a rudimentary nature, and the volume of traffic so small that conventional air attack, particularly at the levels of 1965, is most unlikely to be an adequate weapon.

Under present combat conditions the VC/PAVN forces are estimated to be dependent on external sources for only about 12 tons a day or less [REDACTED] than 20 percent of their total daily logistic requirement. This movement from North Vietnam requires the use of less than 5 percent of the ^{ILLEGIB} capacity of the supply corridor through Laos alone. Indeed, the capacity of this single route can provide the tonnage required from external sources even if the level of these forces increases by nearly 40 percent and the intensity of combat reaches a scale more than 10 times its present level.* Although the capacity of the Communist supply routes could be ~~severely~~ tested by heavy attacks with air weapons currently available, we believe ^{that despite such attacks} the land corridor could supply all logistic requirements even if the expanded VC/PAVN forces were made completely dependent on ~~external~~ sources. To do so, however, would require a heavy commitment of manpower and materials to repair damage to lines of communication.

Even if the land route through Laos were successfully interdicted, the North Vietnamese could fall back on alternate infiltration routes

* These figures pertain to ^{illustrative} current projections attributing VC/PAVN main forces with a capability to build up by the end of 1966 to a level of 155 battalion equivalents fighting once in every 3 days.

to South Vietnam by sea or from Cambodia. These routes would be adequate to enable the Communists to maintain their present level of activity, and to step up the firepower of their forces. These routes would also support an increase of present forces by as much as 40 percent, provided the level of fighting remained approximately at its present level.

III. The Rolling Thunder Attack*

A. Factors Conditioning the Nature and Scale of Attacks

The US and South Vietnamese air campaign against North Vietnam has been ^{one b} the most restricted and voluntarily limited air war ~~ever~~ conducted by a major air power. It has been used as a carefully controlled means of gradual escalation to achieve strictly limited objectives. Consequently, the program has operated under a set of rigorously defined ground rules.

Self-imposed restrictions have limited both the choice of targets and the areas to be bombed. The existence of large restricted areas has effectively insulated almost 80 percent of North Vietnam's limited modern industrial economy from air attack; these areas contain 75 percent of the nation's population.

In addition to area restrictions which limit armed reconnaissance attacks, there are specific sanctuary areas which are exempt from air

* See Appendix B.

[REDACTED]

attack. These areas include a 30-nautical-mile buffer zone along the Chinese border, a 30-mile radius around the city of Hanoi, and a 10-mile radius around the city of Haiphong.

Attacks on specific fixed targets are now limited to those approved in each Rolling Thunder program. These authorizations often provide additional restrictions limiting the number of strikes against approved targets or exempting some types of targets from attack. There is, however, more flexibility in the type of targets for armed reconnaissance. A major restriction is the policy decision to avoid civilian casualties to the extent possible, which has resulted in many targets outside of the sanctuary areas not being approved for attack.

The overall effect of these area and operational restrictions has been to grant a ^{large} ~~critical~~ measure of immunity to the military, political, and economic assets used in Hanoi's support of the war in the South. The restrictions also insure an ample flow of military supplies from North Vietnam's allies. The preconditions established for the number of strikes and sorties, the methods of attack and the avoidance of civilian casualties, result in an operational disregard of basic principles of target selection. Among North Vietnam's target systems not one has been attacked either intensively or extensively enough to provide a critical reduction in national capacity. No target system can be reduced to its critical point under existing rules.

has had
Such
 Finally, the voluntary choice of ground rules ~~which result in~~
~~an ineffective air campaign~~ may well give the Hanoi regime an ~~unwarranted~~
 impression of divided counsel within the US government. [The ~~limited~~ →
 limited nature of the US air attacks after the bombing pause may rein-
 force Hanoi's possible judgment that this restraint reflects a divisive-
 ness and lack of US determination to get on with the war. ⊞

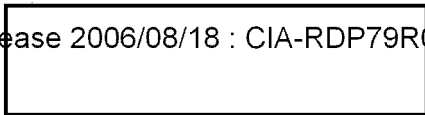
B. Analysis of Rolling Thunder Operations

The Rolling Thunder attack on North Vietnam from 2 March 1965
 through 19 February 1966 delivered a total of 37,000 tons of ordnance *
 on more than 140 fixed targets and numerous targets of opportunity. A
 total of 42,597 sorties were flown -- approximately 57 percent by the
 US Navy, 41 percent by the US Air Force, and 2 percent by the Vietnamese
 Air Force. Attack sorties -- strike and flak suppression -- accounted
 for over 60 percent of total sorties. In terms of ordnance expended
 the Navy-Air Force relationship was reversed with the Air Force account-
 ing for 62 percent of the total. This reflects the fact that the average
 ordnance load of sorties flown by the Air Force is slightly more than
 twice the average load for sorties flown by the Navy. Or stated differ-
 ently, the Navy must fly twice as many sorties to deliver a given weight
 of ordnance in the target area.

A total of 181 aircraft and 154 men were lost. The estimated
 cost of ordnance expended, aircraft lost, and sorties overhead comes ILLEGIB

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to a total of about \$470 million. The assessable return from this attack is \$63 million in damage to economic and military facilities in North Vietnam.

All but 30 of the current JCS Target List targets that are outside sanctuary areas exempt from attack, have been struck. Thus, the opportunities for striking, within existing restrictions, new and important fixed targets are extremely limited. Due to the lack of fresh fixed targets, armed reconnaissance is constituting an increasing share of the total Rolling Thunder attack. Armed reconnaissance has accounted for over 72 percent of total sorties flown and has delivered 68 percent of the ordnance expended by Rolling Thunder, but has accounted for only 21 percent of the estimated cost of damage to North Vietnam. The targets struck on armed reconnaissance usually involve lower restoration costs than do fixed targets, so the effectiveness of the program must be measured primarily in military, political, and psychological terms, rather than economic.

The analysis of the air effort against North Vietnam in relation to total air activities in the Vietnamese war shows rather strong fluctuations in the weekly level of activity. This analysis suggests that fluctuations in the level of activity against the North may reflect a need to temporarily shift aircraft from attack on North Vietnam to support ground operations in South Vietnam or to attack targets in Laos.

Why don't we know the fact of this. Not speculate about it.



Restoration Costs of Facilities
Attacked by the Rolling Thunder Program

Million US \$

	<u>Economic</u>	<u>Military</u>	<u>Total</u>
Attacks on fixed targets	23.6	26.4	50
Armed reconnais- sance missions	12.8	0.7	13
Total	<u>36</u>	<u>27</u>	<u>63</u>

Each month there has been a decreasing return in terms of bomb damage as fewer fixed targets outside the restricted area are available for attack and armed reconnaissance accounts for a greater share of the total air effort. The return has been particularly small since the resumption of bombing due to confining the effort to the low value target system in the southernmost parts of North Vietnam.

About 57 percent of the total damage -- \$36 million -- is attributable to the destruction of economic targets. This cost has been broadly distributed throughout the economic sector and no one sector has been forced to bear unacceptably high levels of damage. In terms of national capacity the greatest damage was inflicted on electric power and petroleum storage facilities. These target systems lost 27 percent and 17 percent, respectively, of their national capacity. In each case, however, the

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target system had adequate cushion in the form of excess capacity
withstand these attacks and ~~to maintain~~ economic activity at almost
normal levels. *(ed he maintained)*

The damage to military facilities is just over \$27 million.
Almost 60 percent of this damage was to military barracks. The effect ILLEGIB
of this damage has been negligible. The damage to military targets has
shown a definite downward trend since the peak month of July 1965.

Other than losses of equipment the damage to military facilities
has prompted the abandonment of installations such as air fields and the
dispersal of equipment and supplies normally stored in ammunition and
supply depots.

B. Casualties

The United States has placed restrictions on the air offensive
against North Vietnam in order to minimize civilian casualties. It has
been to North Vietnam's interest to assert otherwise, however, and
propaganda media attempt to give the impression that the air offensive
has been a vicious and unrestrained assault on the civilian population,
hospitals, schools and other non-military objectives. Nevertheless,
in only one instance have Hanoi officials presumed to provide a total
for the number of casualties. In September, Egyptian journalists were

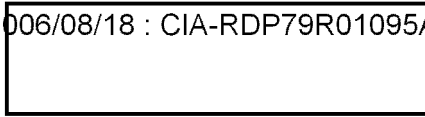
told that total casualties were 75,000, including 40,000 killed and 35,000 wounded. No procedures devised in this report for the purpose of estimating casualties can support a figure of this magnitude.

Although the Rolling Thunder program has flown many thousands of attack sorties against targets in North Vietnam, the toll in human casualties has been light. Through the end of 1965 North Vietnamese casualties -- both civilian and military -- ranged from 11,700 to 14,800 divided about equally between killed and wounded. ILLEGIB

About 55 percent of these casualties were military personnel. The strikes against JCS-designated fixed targets produced about two military for each civilian casualty, whereas the armed reconnaissance missions produced proportionately greater civilian casualties.

	<u>Casualties Resulting from Rolling Thunder</u>		
	<u>Military</u>	<u>Civilian</u>	<u>Total</u>
Attacks on fixed targets	3,900 to 4,700	1,700 to 2,400	5,600 to 7,100
Armed reconnaissance missions	2,600 to 3,200	3,500 to 4,500	6,100 to 7,700
Total	<u>6,500 to 7,900</u>	<u>5,200 to 6,900</u>	<u>11,700 to 14,800</u>

The civilians killed or injured by armed reconnaissance attacks were for the most part truck drivers or transport and construction workers rather directly engaged in maintaining the logistic pipeline to South Vietnam.



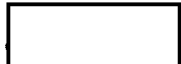
Approximately 3,000 civilian deaths (one-half of total civilian casualties) as a result of military action against North Vietnam is a small number. The impact of 3,000 civilian casualties is slight in a country where over 350,000 persons died in 1965 from other causes and where the accidental deaths alone produced casualties some three to five times greater than those resulting from the Rolling Thunder program.

C. North Vietnamese Countermeasures

The economic and military damage sustained has presented an increasing but still moderate bill to Hanoi, which in large measure can be (and has been) passed along to Moscow and Peiping.

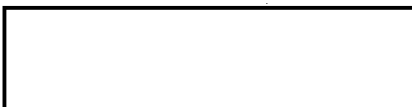
The major effect of the attack on North Vietnam has been to (force Hanoi to cope with) disrupt ~~normal~~ normal economic activity, particularly in transportation and distribution. *Hanoi's efforts towards repair & reconstruction efforts have* been hampered by difficulties in allocating manpower. The regime has relocated large elements of its urban population. Problems in the distribution of food have appeared, although these problems are not yet pressing. *Shain impact by* (The major effect of the bombing has been in the effort required to keep roads and railroads open and sustain the flow of supplies to the South.) (The regime has been singularly successful in effecting countermeasures against US interdiction efforts.)

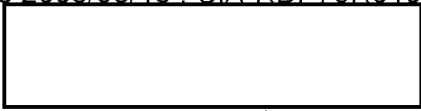
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Much of the damage has been to installations which the North Vietnamese do not need to sustain the military effort. No attempt to



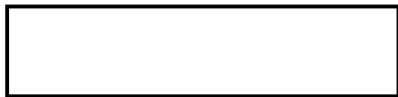


restore petroleum storage facilities has taken place and only recently have there been indications of intent to repair some of the damaged electric power stations. In both cases the failure to restore or repair is explained by the existence of adequate excess capacity ^{or} and the fact that the ~~major and vital~~ ^{which} facilities have ~~not~~ ^{were not of} been attacked. ^{vital}

A similar phenomenon is noted in the absence of repair of military facilities. The military have chosen not only the outright abandonment of facilities such as barracks, but also the dispersal of the material usually stored in ammunition and supply depots.

An examination of destroyed and damaged facilities shows that only a small number were truly essential to the war effort. The major essential restoration has consisted of measures to keep traffic moving, to keep the railroad yards operating, to maintain communications, and to replace transport equipment and equipment for radar and SAM sites. These measures have probably been effected at a cost of between \$4 million and \$5 million or between 5 and 10 percent of the total economic and military damage sustained in North Vietnam to date.

The increasing Soviet and Chinese commitments to sustain the flow of military and economic aid to North Vietnam imply an obligation to underwrite the economic restoration of the country on a grant basis or on favorable terms. This assurance is almost certainly a controlling determinant in Hanoi's attitude toward the loss of its economic facilities.





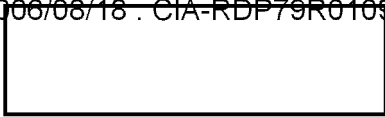
In the Korean War, similar economic losses did not deter P'yongyang during the conflict, and restoration assistance was provided by both China and the USSR.

Support of the insurgency in the South has been only indirectly affected by the bomb damage. North Vietnam's major inputs to the conflict in the South are its provision of military leadership and manpower and its function as the control center and logistic base for the Viet Cong and North Vietnamese force. North Vietnam serves essentially as the logistic funnel through which the flow of military supplies, particularly weapons and ammunition from the USSR and China, is maintained.

Despite the concentration of Allied ^{our} attacks in the South and in Laos and the resumption of bombing in the North, the movement of trucks during the current dry season along the infiltration routes through Laos is twice the level of a year ago, and the North Vietnamese are using larger trucks with heavier loads. [If this movement is sustained, the volume of supplies available for onward movement to South Vietnam -- some 50 to 70 tons a day -- will be at least three times the level sustained in 1965.] The North Vietnamese through intensive efforts have increased the capacity of the lines of communication and made them less vulnerable to air attack. ^{they have built} New ^{improved} bypasses and ferries now ^{to} circumvent bombed bridges, ^{improved} old roads and trails have been ^{constructed} improved, and new roads have been ¹ ^{lines} ^{constructed}. In several instances roads previously limited to dry



IMP



*w / or w/o
interd
effort*

season operation now have an all-weather capability. The current and projected dry season capacity of the route through Laos is adequate to accommodate a buildup of the Viet Cong and North Vietnamese main force of at least 40 percent and an intensity of combat more than 10 times the present level.

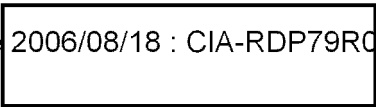
This ability to react and to offset the effects of the air attacks has not been without its costs. It is estimated that the diversion of manpower to tasks associated with dispersal programs and emergency repair and maintenance of lines of communication throughout North Vietnam may require the full time services of 200,000 workers (equivalent to about 10 percent of the nonagricultural labor force). An additional 150,000 people are also obligated, on a part-time basis, to serve in various aspects of civil defense which take them away from their normal pursuits. Thus a significant share of the labor force is diverted in varying degrees to supporting the war in the South.

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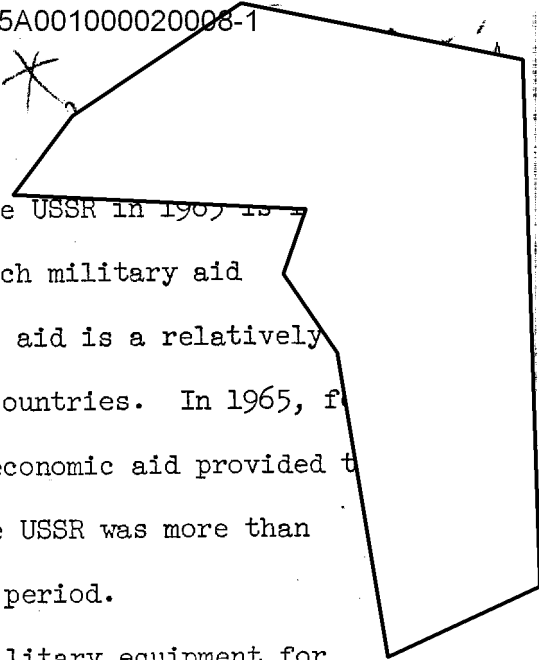
D. Effect on North Vietnam's Allies

In response to the intensified US and Vietnamese air offensive in 1965, all countries of the Communist camp have extended economic assistance as proof of their support. The response on the part of North Vietnam's allies, however, has been more unstinting in political and economic support and much more restrained in the military field. The major economic and military aid programs have been undertaken by the USSR and Communist China. The Eastern European Communist countries have generally extended only token amounts of assistance.





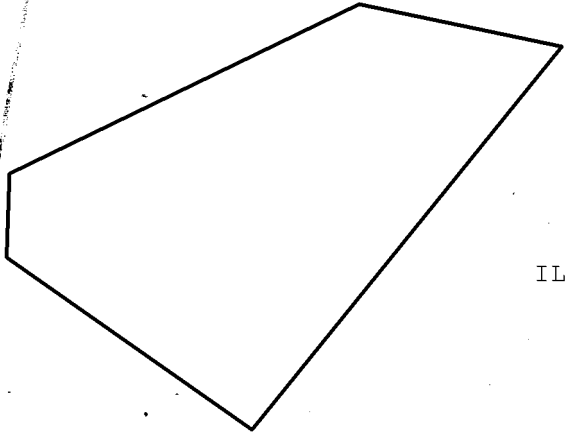
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Total assistance extended by China and the USSR in 1965 is the order of \$250 million to \$400 million, of which military aid accounted for \$150 million to \$200 million. This aid is a relatively insignificant drain on the capabilities of both countries. In 1965, for example, the value of military equipment and of economic aid provided to less developed countries of the Free World by the USSR was more than twice that supplied to North Vietnam in the same period.

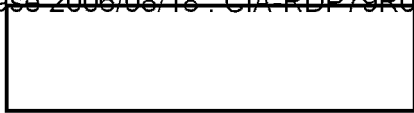
The USSR is by far the major source of military equipment for North Vietnam, supplying 70 to 95 percent, or \$142 million, of the total provided in 1965. The major components of Soviet military aid were SAM sites (15 to 20), antiaircraft guns (1,000 to 1,200), planes (44), motor vehicles (2,600), and radar, and jet fuel. China's identified military aid, totaling only \$11 million, consisted principally of planes (8) and trucks (1,400). Military aid from the Eastern European Communist countries -- consisting principally of small arms and ammunition, medicines and medical equipment, and some trucks -- is valued at only a few million dollars.

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V. The Potential of Air Attacks Against North Vietnam*

The Rolling Thunder Program has been relatively ineffective because of three basic factors: ~~(1) the negligible contribution of the economic plant in North Vietnam to the military effort in the South;~~ ^{it has had to} (2) ^{operate within} the highly restrictive (and militarily irrational) ground rules, ~~under which the program must operate;~~ ^{it} and (3) the fragmentation of the air attack on a variety of military and economic target systems, with the greatest weight of bombing being expended in a comparatively invulnerable rudimentary transport network in the southern part of North Vietnam.

If the effectiveness of the campaign is to be raised significantly, two fundamental changes must be made. The first is a basic change in ground rules to remove area and target limitations. The second is a more rational use of basic principles of target selection.

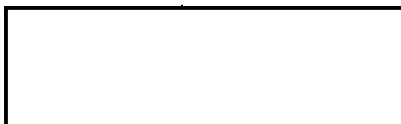
A. Some Principles of Target Selection

The following principles of target selection apply to the analysis of any industry or service that is being considered as a potential target system because of its contribution to military output or to the sustaining of military operations.

1. Use Pattern

This factor covers the extent to which a particular system really contributes to military output or to military operations, to civilian uses,

* See Appendix D.



to export, and so forth. Certain of these uses are essential and others are nonessential. The more detail in which a use pattern can be analyzed the more illuminating the process becomes.

2. Depth

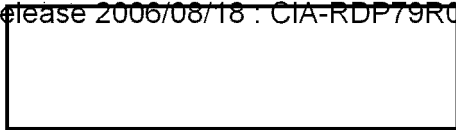
This factor covers the travel time of a product from the point of manufacture to the front line strength of the enemy. The travel time or lead time on the steel industry, for example, to the front line is probably on the order of a year or more, whereas the aircraft assembly can be measured in terms of a few months.

3. Cushion

This factor includes a variety of considerations such as the extent to which pre-attack consumption must be cut back before essential requirements are affected, the extent to which the enemy can employ a substitute, the size of stocks, goods in the pipeline, and the like. The most important factor with respect to cushion is the determination of the so-called "critical point," which is the point to which the output of the target industry or service may be reduced without serious effect. Below the critical point the effects begin to be felt with increasing impact.

4. Target Vulnerability

This factor covers the appraisal of the physical vulnerability of a potential target system to attack by existing military means. The



size of weaponry available and needed, the level of bombing accuracy which is achievable, the physical hardness of the target, and other pertinent considerations enter into this calculation.

5. Recuperation

This factor covers both the time and size of effort needed to repair or replace the essential parts of a damaged target system. The enemy's existing production of standard machine tools, for example, may be so large that a few day's output would provide all the equipment needed to retool a target industry.

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6. The Principle of Concentration

This factor is of overriding importance in attacks on either tactical or strategic target systems. The principle of concentration fixes attention on two primary factors:

- a. The essentiality of taking on all or the major part of any target system under attack, in order to cut through the cushion.
- b. The essentiality of concentrating the attack in point of time to overwhelm the ability to reconstruct or repair.

B. Fragmentation of Attacks

The spreading of bomb tonnage over a great variety of military and economic target systems but attacking no one of these in depth has been characteristic of the Rolling Thunder Program. The unattacked



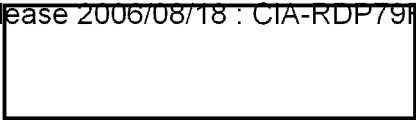
targets represent, for any one system, more than adequate capacity to meet all essential requirements. The attacks on major target systems in some cases have been phased over such long periods of time that adequate readjustments to meet the disruption had been effected.

C. The Military Significance of North Vietnam

The military significance of North Vietnam is measurable in terms of three basic functions which it carries on in support of the conduct of military activities in South Vietnam: (1) a logistic funnel for the stockage and movement of supplies into South Vietnam; (2) a source of manpower; and (3) a control center for the direction of insurgency.

1. The Logistic Funnel

The North Vietnamese economy, which is basically one of subsistence agriculture, has only a small modern industrial center concentrated in a few urban centers, including Hanoi, Haiphong, Nam Dinh, Viet Tri, and Thai Nguyen. The country imports little food even in poor agricultural years and depends largely on domestic production to feed its population. Agriculture in 1964 accounted for almost one-half of the gross national product (GNP). North Vietnam produces only minor items of military equipment -- grenades, mines, mortars, and ammunition for small arms -- and must import all of its heavy military equipment and most of its small arms, ammunition, and medical supplies from Communist countries.



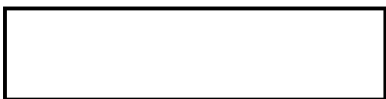
2. Manpower

A major aspect of North Vietnam's military significance is its capacity both to train and to supply insurgent Viet Cong personnel for later infiltration into South Vietnam and to provide substantial increments of its own population, to serve in South Vietnam or in indirect support functions.

North Vietnam has a population of over 18 million. Since 80 percent of the labor force is engaged in agriculture and is greatly underemployed, this primitive economy has basically large reserves. A large-scale mobilization of manpower has reportedly been underway in North Vietnam during 1965.

The country has about 4 million draft-age males, almost all of whom have been put in the regular armed force, paramilitary organizations, or labor repair and maintenance battalions. In addition to these manpower resources, an estimated 175,000 males reach draft age each year, of which at least 100,000 will be physically fit for military duty.

It is estimated that North Vietnam has the capacity to train and infiltrate the equivalent of nine North Vietnamese battalions each month during 1966, or a total of approximately 54,000 men. This estimate of North Vietnamese capability to infiltrate forces into South Vietnam is a gross rate only. The net additions to be made to the Communist



forces in South Vietnam will depend, in addition to decisions on the rate of North Vietnamese infiltration, on the capability of the Viet Cong to train new and replacement troops, and the casualty rates inflicted upon Viet Cong and North Vietnamese forces during the year.

North Vietnam has also demonstrated a capacity to mobilize large numbers of personnel for activities involved in supporting the insurgency in the south. The diversion of manpower to tasks associated with dispersal programs, emergency repair, construction and maintenance of lines of communication throughout North Vietnam may require the full-time services of 200,000 workers (equivalent to about 10 percent of the nonagricultural labor force) and the part-time impressment of another 100,000. An additional 150,000 persons are also obligated, on a part-time basis, to serve in various aspects of civil defense which take them away from their normal pursuits. These levies represent a significant share of the labor force and an admitted cost to North Vietnam in supporting the war in the South. This problem does not yet seem to have reached a critical point.

3. Control Center for Insurgency

The function of North Vietnam as the control center for Viet Cong insurgency is well documented in intelligence materials.

The major instrument of political control and direction of the Viet Cong insurgency is the Lao Dong Party, specifically the Committee for the Supervision of the South, which is attached to the Party's Central Committee. The Communist Party of North Vietnam has in effect as its southern branch, the People's Revolutionary Party of South Vietnam.

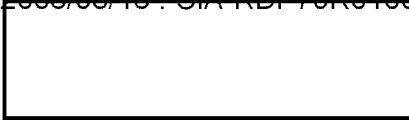
The North Vietnamese Communist party and government linkage with the National Liberation Front (NLF) is close and clear. Hanoi maintains control over the NLF through the Communist leaders in South Vietnam to whom the North Vietnamese issue over-all guidance.

The infiltration routes through Laos and into the three northernmost provinces of South Vietnam apparently are under North Vietnamese military control and direction. However, Viet Cong Military Region V headquarters in South Vietnam shares in the control of infiltration routes in the Northern province and is probably the major controlling authority throughout the rest of Military Region V. In Laos the control of porters and infiltrators is under the 70th Transportation Group, which is under direct control of the PAVN High Command in Hanoi. At least two other Transportation groups have been identified in activities to maintain the transport corridors through Laos and in the northern part of South Vietnam.

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D. The Logistics Target System

1. Results of the 1965 Campaign

During 1965, more than 4,600 strike and flak suppression sorties carrying more than 3,400 tons of ordnance were flown against fixed targets on lines of communication (LOC's) in North Vietnam. Few of these targets were located on the railroads and roads north and east of Hanoi. Armed reconnaissance played a very significant additional role in the program to interdict LOC's, but again concentrated for the most part in the southern parts of North Vietnam.

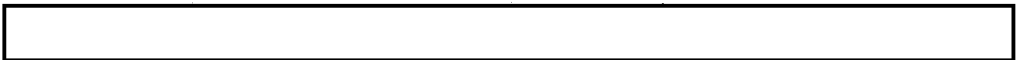
These attacks made it more difficult and expensive for North Vietnam to maintain normal economic activity and to support the war in the South. Nevertheless overall performance by the modern transport system was maintained at the levels of 1964, even though some important export traffic movements -- for example, apatite -- were halted completely. The transport system directly involved in the movement of men and materials to Laos and South Vietnam was able to sustain and to increase the flow of this traffic. At the same time the number of routes and bypasses was increased, thus making the network less vulnerable to air attack. The results of the interdiction campaign show clearly that the original expectation that it would reduce LOC capacity in the southern part of the country by about two-thirds and even more in the north could



25X1



not be realized. The North Vietnamese had sufficient recuperability resources so that a two-thirds reduction in capacity was imposed for only a very short period of time if at all. The most successful interdiction -- the Hanoi-Lao Cai rail line -- apparently was effective because of the relatively heavy level of traffic on this line and the fact that it is one of the few major transport routes without alternative means of transportation.



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on 15 segments route capacity had been ~~maintained at the same level~~ ^{restored to previous} maintained at the same level, on 2 segments capacity had increased, and on 9 segments capacity had been reduced. Only on two of these nine segments had capacity been reduced more than 25 percent.

Traffic volume on the major infiltration routes is at levels substantially below -- only rarely over 25 percent -- even interdicted route capacities. Bomb damage on these routes is invariably repaired quickly and inexpensively.

In summary, the rudimentary nature of the logistic targets in the South, the small volume of traffic moving over them in relation to route capacities, the relative ease and speed with which they are repaired, and the extremely high frequency with which they would have to be restruct -- once every three days -- all combine to make the logistics network in the South a relatively unattractive target system.

Southern part of the network - 26 segments has been checked

25X1

A significant lesson from the Rolling Thunder program to date is that the goal of sustained interdiction of the rudimentary road and trail networks in southern North Vietnam and in Laos will be extremely difficult and probably impossible to obtain in 1966, given the conventional ordnance and strike capabilities likely to exist. The ease with which bypass roads, river crossing, and ferries can be constructed and the ability to resort to human transport when necessary make these extremely unprofitable targets. This is borne out by experience in both the Korean War and the present conflict. In Korea the interdiction program flew sorties at three times the level of Rolling Thunder against a logistics target system moving almost 250 times the amount of supplies moving into South Vietnam. Yet the North Koreans ^{or CCP's} were able to move in their daily logistic requirement and make significant additions to stockpiles.

The recent effort in Laos during the bombing pause also points out the relative ineffectiveness of conventional interdiction programs against simple high-capacity logistic systems made up of highway targets. During the five-week period of the bombing lull in December 1965-January 1966, 9,000 sorties (8,000 of which were over the Panhandle) were flown to drop about 18,000 tons of ordnance on the supply routes to South Vietnam. Despite this effort, the level of truck traffic moving south on these routes was twice the average of 15 trucks per day moving south during the same period in 1965. For these reasons, the sortie

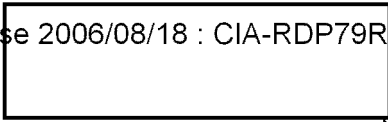
[REDACTED]

and ordnance expenditure presently used against supply routes in the South could probably be more effectively used against the more lucrative LOC targets in the North.

2. A ~~Recommended~~ LOC Target System *alternate*

The source of logistic supplies not obtainable in South Vietnam for the Viet Cong and North Vietnamese forces and for North Vietnam's defense forces is the military aid being provided by the USSR and China. Although the flow of supplies from these sources can not be cut off, the movement could be made considerably more expensive and unreliable if authorization is granted to attack intensively the rail connections to Communist China and if the three major ports are effectively mined, thereby closing off the movement of oceangoing ships. At the same time, the flow of imports needed to sustain economic activity could almost certainly be reduced. *GUTS*

About two-thirds of North Vietnam's imports are carried by sea transport and the remainder move principally over the rail connection with Communist China. Mining the entrances to the three major ports would effectively transfer almost all imports to rail transport. The rail connection to Communist China, which is currently used at only about one-third of capacity, would then be forced to attempt to operate at close to full capacity under interdiction conditions. If production



don't plug this too hard. Cement is fine by se.

in war supporting facilities in North Vietnam, particularly the cement plant, were halted at the same time, an import requirement would be generated which would be far in excess of rail capacity. The result would in effect be the creation of a highly consolidated and concentrated logistics target which when successfully attacked would yield significantly greater results than those obtained by attacking the numerous small logistic target systems in the southern parts of North Vietnam and Laos. The logistic target system in the northern part of North Vietnam would then be more like such a system in a developed economy at war, and which is required to maintain high levels of both economic and military traffic. The disruptive effect of interdiction of this rail system would then be more immediately felt. Sustained interdiction of the line would force Hanoi to allocate considerable amounts of manpower and materials to maintain the line and alternate highway routes. The repair of major bridge structures would be measurably more complex and expensive than the relatively simple expedients which keep traffic moving in the southern provinces and in Laos. Sustained 24-hour interdiction and destruction of locomotives and rolling stock by armed reconnaissance would probably stop all daylight traffic and disrupt night-time traffic, thus slowing down the movement of supplies and making the logistic resupply of Communist forces considerably less reliable

want the fire here

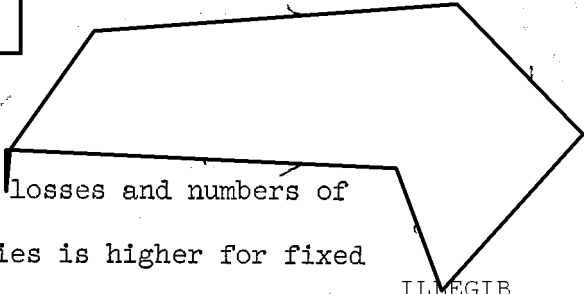
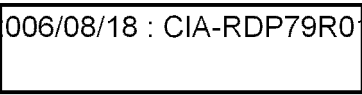
and it

~~slow down S. transport line on war supply~~

V
you are going to be trying to do diff. things. In S. you're trying to cut discreet shipments with aggregates - N07 29 - In N. you're

locally + wd over time he fell in MRIV. (miss as a MEL)





There is a direct connection between losses and numbers of sorties flown, but the ratio of loss to sorties is higher for fixed target strike sorties than for armed reconnaissance strike sorties.

ILMEGIB

(incl Guam)

The air attack capability in the Southeast Asian area, as indicated by performance in December 1965, stands at about 630 sorties per day, or more than 26,000 tons of ordnance per month. This capability is directed against the three principal target areas -- South Vietnam, North Vietnam, and Laos -- as military and political requirements dictate. During the latter part of 1965 approximately 20 percent of the total air attack on the three areas was directed against North Vietnam.

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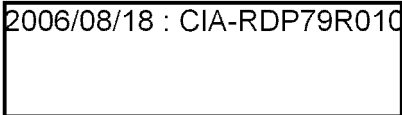
IV. Effects of the Rolling Thunder Program*

A. Physical Effects

The estimated dollar cost for the restoration of economic and military targets attacked in the Rolling Thunder campaign is less than 10 percent of the value of the economic aid given to North Vietnam in recent years by Communist countries.

* See Appendix C.





than at present. As a result, some economic requirements at least would go unsatisfied.

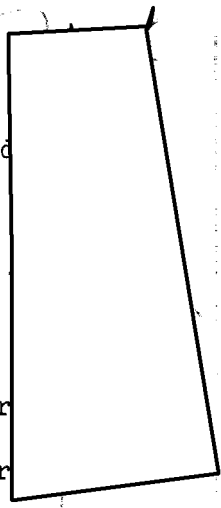
The North Vietnamese would probably be forced to make greater use of alternate means of transport such as coastal and inland waterways. Although it would be extremely difficult to interdict these systems, their greater use would increase the opportunities for harassment of actual traffic movements.

The specific program ^{was} recommended would include attacks on 29 major bridges and the four principal railroad yards and shops (see Table 1). The initial strikes against these targets would require an estimated 1,670 strike and support sorties and 1,560 tons of ordnance.

The ^{was} restrike effort required to keep these targets interdicted has not been calculated, but it would involve armed reconnaissance on a 24-hour basis. An interdiction program only against the two rail connections to China -- the Hanoi - Lao Cai and Hanoi - Dong Dang lines -- would require an estimated 750 strike and support sorties monthly. Sustained interdiction and armed reconnaissance of the land transport targets in the north would probably require over 3,000 sorties monthly. This program would stop through traffic on major routes, but more intensive attacks would probably be necessary to deny the use of these routes for shuttle service. Attacks on these 33 land transport targets, the major

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Successful



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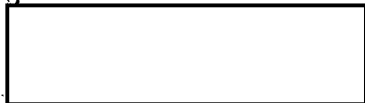
in what terms?

portion of which are located on the more heavily used transport routes of the country, would be much more effective than attacking minor bridges in the south and other outlying areas, and from the standpoint of identification would be more easily carried out than attacks on the more obscured, smaller, and diverse transport targets in the south.

This attack, to be effective, must be combined with the mining of the three major ports. The mining program would require initially 104 sorties and only 190 tons of ordnance. The closing of the ports to oceangoing traffic would throw almost all of North Vietnam's import traffic onto the rail connection to China. The Hanoi-Dong Dang line would then be operating at or close to full capacity. If other essential import requirements were generated by neutralization of industrial facilities, such as the Haiphong cement plant, import traffic would then exceed the capacity of the rail line. With only limited highway capacity available interdiction of northern transport lines would then have a more immediate and direct impact. The flow of military supplies into North Vietnam and onward to South Vietnam would be slowed up and made more costly. Some economic imports would probably have to be foregone. In summary, the North Vietnamese regime would, by this program, be brought under far stronger pressures from air attacks than that obtained by the pattern of airstrikes in 1965. This program if

(Some wd come in on letters)

*(Casualties)
(you must mention)*



at the same time

carried out would place no real restraint on the level of Communist activity in South Vietnam until their requirements for resupply become much higher than now estimated.

3. Some Limits to Resupply

K1 (The upper limits on the level and cost of logistic support which the Hanoi regime would be willing to sustain ^{cannot be} ~~have not been~~ quantified, ~~at this time.~~) Several factors are relevant to the determination of that level. One factor is the limit to which local labor can be diverted to maintain the supply lines and support the logistic effort without an unfavorable impact on essential industrial and/or agricultural production. Substantial additional diversion of labor could necessitate imports of food to make up for production lost because of a shortage of farm labor. This could aggravate existing internal distribution and import programs, particularly if the major ports were closed and the rail and highway connections to China were being subjected to heavy interdiction.

A direct influence on logistic needs is the extent to which allied offensive operations ^{in the CV/N} can force the Communists to use supplies at a higher rate or deny them access to existing stockpiles. If, for example, the build-up and level of combat projected for the end of 1966 also involved a total dependence on external sources for supplies, the North Vietnamese would have to supply about 250 tons a day to the South.

E. The "Will of the Regime" as a Target System

In North Vietnam, ⁴~~three~~ main factors appear to affect the determination of the regime to continue to support the war in South Vietnam: (1) the course of the war itself in the South; (2) the degree of political and material support for the policy rendered the regime by its two main allies, the USSR and Communist China; ~~and~~ (3) the economic, social, and political consequences of supporting the war in South Vietnam within North Vietnam itself. The effort required in supporting the war in South Vietnam draws very little upon the physical resources of North Vietnam. The neutralization of given target systems within North Vietnam does, however, exact an increasing cost as the price to be paid for supporting the insurgency.

If air attack is to be a significant factor in the attaining of US objectives a substantial revision must be made in the self-imposed ground rules. Air attack can increase significantly the price which North Vietnam pays to continue the war and reduce the ease with which it carries on its support of the war in the South.

A preliminary ranking has been made of the various possible target systems with the exception of lines of communication (which is discussed elsewhere) in a rough order of their importance to the military effort. This section presents a judgment on the feasibility or desirability

[REDACTED]

of subjecting them to air attack at the current stage of the campaign and evaluates the probable impact of a postulated attack. Estimates of the forces and ordnance required for attack are presented only for those target systems which presently are recommended for inclusion in a revised Rolling Thunder (see Tables 2 and 3). Six target systems have been considered: (1) the military supply system, (2) the military/economic system, (3) the modern industrial system, (4) the command and control system, (5) an agricultural system, and (6) the manpower system.

Extension of Rolling Thunder at this time is recommended only to the first two target systems, in addition to the LOC system discussed separately. The details of these attacks are shown in the tables included.

1. Military-Supply Targets -- Twenty-six military barracks and/or supply targets remain unattacked although they are on the JCS target list (see Table 2). Since almost all of these are in the "sanctuary" areas, the extent to which they are occupied is not known. If reconnaissance were to reveal a significant level of activity at these facilities, they would be valid military targets whose neutralization would impede the flow of military supplies and disrupt military training programs in North Vietnam. The barracks on the list are those believed to be associated with military

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training programs in support of the infiltration. The effect would be increasingly disruptive if other attacks on military/economic and LOC targets are carried out simultaneously, in order to obtain a maximum disruption of the flow of essential military supplies into North Vietnam and their eventual redistribution to military consumers. Virtually simultaneous attack would be needed for effectiveness, particularly the barracks attacks. Based on previous experience we can assume that these barracks will be abandoned after the first strike.

2. Military/Economic Targets

The economic targets in North Vietnam's modern industrial base which have a direct bearing on the regime's ability to support the war in the South are the major bulk petroleum storage facilities and the Haiphong cement plant (see Table 3). The petroleum storage installations sustain the supply and distribution activities within North Vietnam and through Laos, and are vital to the mobility of North Vietnamese military forces and to distribution and transport services for the civilian economy. The Haiphong cement plant as the sole producer in North Vietnam provides a major input to both normal construction activity and the intensive reconstruction and repair programs necessitated by Rolling Thunder attacks.

The extension of airstrikes against eight major POL storage terminals would deprive the regime of all but some 10,000 tons of storage dispersed in a variety of untargeted locations and some 2,200 tons in

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small buried tanks at seven newly identified dispersed storage facilities. The planned attacks would eliminate the principal bulk petroleum terminals in North Vietnam and would preclude the delivery of petroleum supplies in bulk by tankers.

but these can't get in anyway - Mines!

A minimum of 440 sorties, comprising 280 strike aircraft and 160 support, will probably be required to destroy these facilities. The ordnance requirement for these targets is estimated to be about 850 tons.

If the attack is to obtain optimum effect, it is imperative that it be carried out almost simultaneously on all petroleum storage targets. Simultaneous attack insures the most certain way of eliminating the cushion represented by excess storage capacity and stocks and thus reaching the critical point in meeting essential requirements. The loss of petroleum storage facilities -- and their contents -- would have an immediate effect on the economy. The effect on normal industrial production activities would be slight because most of the industrial enterprises in North Vietnam rely on coal or electricity for energy. The major effect in the civilian economy would be in transportation and distribution.

A sustained loss of petroleum storage facilities coupled with an inability to import even minimum operating requirements would have its greatest effect on military operations. North Vietnamese military

forces account for about 60 percent of total petroleum consumption, or a monthly average of about 8,500 tons. North Vietnam with Chinese cooperation would probably be able after an initial period of disruption to maintain petroleum imports at almost normal levels even after the intensified attacks discussed in this report. Therefore, the supply of essential imports of petroleum for military requirements would appear to be almost certain.

Nevertheless the attack would compound the difficulties of maintaining the flow of imports and military aid on the land transport connections to Communist China. The difficulties would be increased as attacks on other target systems increased the traffic flows in these land and coastal water transport routes.

An attack on the Haiphong cement plant would, by neutralizing North Vietnam's only producer of cement, create a major impediment to reconstruction and repair programs at least in the short run. Over the longer term, cement could be imported from China. The import requirement could be in the order of 700,000 to 800,000 tons a year to meet all military and economic needs, a volume that would require a doubling of the present tonnage of all seaborne imports. If the cement and all seaborne imports had to be carried on the rail line from China, the total traffic volume would be in excess of the normal capacities of the Hanoi - Dong Dang

[redacted]

rail line and the highway connections to China, and far in excess of their capacity under conditions of interdiction.

3. Industrial Targets

North Vietnam's small modern industrial sector contains a few highly prized and nominally lucrative industrial targets. Principal among these are the Hanoi machine building plant, the iron and steel plant at Thai Nguyen, and the Viet Tri chemical combine.

These plants and an additional 11 smaller plants constitute almost all of the modern industrial targets. They could be taken under attack by airstrikes involving about 500 sorties and the expenditure of slightly over 500 tons of ordnance. Alternatively a successful attack on the main electric power facilities could effectively put almost all of these plants out of operation.

Such an attack is often postulated as one which by depriving Hanoi of almost all of its modern economy and the major hallmarks of its economic progress will persuade the regime to enter into negotiations to end the war. This outcome is uncertain and probably unlikely. North Vietnam's modern industrial economy makes almost no direct or significant contribution to the war effort, which is sustained materially almost exclusively by supplies from other Communist countries. Since North Vietnam is essentially a subsistence economy the modern industrial sector makes only a limited contribution to economic activity. The loss of

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industrial production would have almost no impact on the great mass of this agrarian society. The small element of the population directly affected would hardly be sufficient, or disposed, to persuade the regime to stop the war. For these reasons an attack on the modern industrial base of itself would not be likely to attain US objectives.

The experience of the Korean War also supports this judgment. Korea in 1950 was a country with a population considerably smaller and an industrial base much larger than that of North Vietnam in 1965. Almost all of Korea's modern industry was destroyed in the first three months of the war as part of a program to punish Korea and to force the North Koreans and Chinese to accept UN truce proposals. Nevertheless this attack failed to impede seriously the North Korean military or to dissuade the Chinese from entering the war. In both North Korea and North Vietnam it is clear that the modern industrial base is too small to serve as a testing ground for the "hostage" concept of industrial destruction as a means of deterring aggression.

This potential target system does serve to provide a list of optional targets for possible use when other air attacks or activities in South Vietnam might produce indications of a weakening of Hanoi's determination to carry on with the war. At such a point, attacks on industrial targets could provide additional psychological pressure on the regime and the morale of its people.

4. The Command and Control, Agricultural, and Manpower Targets

The attacks on these targets are not recommended at this time. In each case the effects of the attacks are debatable and are likely to provoke hostile reaction in world capitals.

The breaching of the agricultural levees would be extremely difficult to do successfully and, moreover, would probably be rejected on humanitarian grounds. Even if carried out, any resultant loss of food supplies would fall on the lowest priority groups in the population.

The command and control system consists essentially of major communications facilities and the national headquarters of the Ministry of National Defense, and the Party-Government Building Complex at Hanoi. All of these targets are located in the Hanoi sanctuary. An attack on them would require about 360 sorties and an estimated 445 tons of ordnance. The effect of these attacks is debatable. North Vietnam's reliance on high-frequency radio facilities means that essentially the communications system for command and control purposes is invulnerable to air attack. Moreover, known changes in North Vietnam's command and control system, plans for decentralization and the establishment of alternate control centers would, if in operation at the time of attacks, tend to reduce their impact on Hanoi's ability to maintain order and control. Mass attacks on the major control and command centers which are

[REDACTED]

located in densely populated urban areas would provoke a hostile reaction in other world capitals. For this reason and since the outcome of these attacks is debatable, this course of action is not recommended at this time.

The highest price to be imposed in North Vietnam would be represented by large-scale attacks on cities in order to maximize the number of casualties among skilled workers, thereby reducing their contribution to mobilization potential and to the maintenance of a viable economy. No calculations of the numbers of sorties, the volume of ordnance, or the probable number of casualties to be achieved by mass attacks on the eight urban cities have been made. To the extent that the attacks produce mass casualties and have a sufficiently harmful effect on civilian morale, the regime might find it increasingly difficult to continue with the war and might become more receptive to negotiations. However, attacks designed solely to produce mass casualties among a civilian population would be most difficult to support or justify at this stage of the war.

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Errata Sheet for the Draft of

THE ROLE OF AIRSTRIKES IN ATTAINING
US OBJECTIVES IN NORTH VIETNAM

Page i, para 2, line 4: Should read "would result in a relatively ineffective program."

Page iii, Recommendations para 2, line 2: Should read "current low-yield targets in southern regions of North Vietnam (and Laos) and"

line 5: Should read "in the southern regions (and Laos) ..."

line 6: Should read "achievement of overall objectives, but a redirection of some of the effort to the northern area of North Vietnam would increase the returns from air attack."

Page iv, para c, line 4: Should read "lines, which probably would not be able ..."

line 5 ff: Should read "requirements. Coastal and inland waterways and highways would be used to an increased extent to help cope with the supply problem and would themselves begin to present more lucrative targets."

Page 4, footnote: Should read "These figures pertain to current projections which attribute to the Viet Cong and North Vietnamese main forces a capability to build up by the end of 1966 to a level of 155 battalion equivalents fighting once in every 3 days."

Page 5, line 1: Should read " ... These alternate routes probably would be adequate"

III, A, para 2, line 5: Should read "the nation's population and the most lucrative military supply and LOC targets."

Page 7, line 2: Should read "a relatively ineffective ..."

B, line 5: Should read "... and 2 percent by the South Vietnamese"

last line: Should read "... aircraft lost, and sortie overhead comes"

Page 8, line 4: Should read "Of the targets on the current JCS Target List that are outside sanctuary areas, all but 30 have been struck. Thus the opportunities within existing restrictions for restriking new and ..."

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para 2, line 3: Should read "... This analysis suggests that these fluctuations may reflect a need to shift aircraft temporarily ..."

Page 10, para 1, line 5: Should read "resumption of bombing as a result of confining most of the effort ..."

Page 11, line 5 ff. Should read "... military barracks, but the effect has been negligible."

line 8 ff. Should read "The damage to military facilities not only has resulted in losses of equipment but also has prompted the abandonment ..."

Page 15, line 1: Should read "In the Korean War, more severe economic ..."

Page 16, lines 10 & 11: Should read "may now require the full-time services of 200,000 workers (equivalent to about 10 percent of the nonagricultural labor force) and the part-time impressment of another 100,000."

Page 20, para 6, b, line 2: Should read "... the ability to reconstruct, repair, or disperse."

Page 21, line 2: Should read "... The attacks on major targets"

line 6 ff: Should read "The significance of North Vietnam to military activities in South Vietnam is measurable in terms of three basic functions which it assumes: (1) as a ... (2) as a ... and (3) as a ..."

Page 22, para 3, line 3 ff: Should read "... and maintenance battalions. An estimated 175,000 males reach draft age each year, of which at least 100,000 are physically fit for military duty."

para 4, line 3: Should read "... of approximately 54,000 men for the full year."

Page 23, line 5: No paragraph

line 7: Delete from "The diversion" to the end of the paragraph.

Page 24, para 3, line 5: Should read "... in the northern provinces." (delete remainder of the sentence.)

Page 25, line 1: Should read "During 1965, more than 2,700 strike and flak ..."

line 3: Should read "fixed targets on LOC's in North Vietnam. Relatively few"

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Page 26, last para, line 2: Should read "in the southern part of North Vietnam, ..."

last line: Should read "logistics network in this region a relatively ..."

Page 27, para 2, line 6: Should read "flown to drop perhaps 18,000 ..."

Page 28, line 2 ff: Should read "southern region could probably be more effectively used against the more lucrative LOC targets in the northern part of North Vietnam."

line 12: Should read "the flow of imports needed to sustain economic activity in North Vietnam could almost"

Page 30, line 4: Should read "... transport such as highways and coastal and ..."

line 10: Insert following "Table 1." The probable increase in aircraft losses resulting from a concentration of air effort on the northern LOC's has not been analyzed.

Page 36, line 13: Should read "... Haiphong cement plant, import requirements"

Page 37, last line: Should read "... about 250 tons per day to the insurgent forces in South Vietnam"

Page 38, line 3: Should read "Vietnam: (1) the course of the war; (2) the degree"

line 10: Should read "within North Vietnam, however, would exact an ..."

Page 42, line 1: The sentence beginning "The effect would be" should be moved to the end of the paragraph.

Page 44, line 6: Should read "160 support, will probably be required to neutralize these facilities. The"

line 11: Should read "... storage capacity and stocks and of preventing such countermeasures as dispersal, and thus"

Page 45, para 3, line 1: Last word should read "neutralizing"

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Page 47: First full paragraph should read "The experience of the Korean War also supports this judgment. Korea in 1950 was a country with a population considerably smaller and an industrial base much larger than those of North Vietnam in 1965. Most of Korea's modern industry was destroyed in the first three months of the war. One year later, hydroelectric plants were attacked to increase pressures on the regime. Attacks in the spring of 1953 against irrigation dams brought further pressure on the Korean economy. This carefully phased program failed to force the enemy to accept UN truce proposals. Nevertheless, this attack ..."

Page 48, line 4: Should read "The breaching of the levees in the Red River delta region would be extremely"

line 11: Should read "at Hanoi. All of the headquarters are located in built-up sections of the Hanoi sanctuary. An"

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