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3. Civilian and Military Casualties North Vietnam
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DIA review(s) completed.

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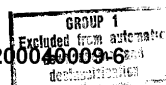
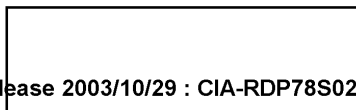


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DIA review(s) completed.

3. Civilian and Military Casualties

A. Summary

The number of casualties in North Vietnam which have resulted from bombing attacks by the United States cannot be estimated with any precision. However, the analysis [redacted]

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[redacted] has provided sufficient evidence to suggest an estimate. This estimate, given a 25 percent margin of error, reflects the best information currently available. "

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The United States has continued to place restrictions on the air offensive against North Vietnam in order to minimize civilian casualties. North Vietnam, however, maintains that the Rolling Thunder program is a vicious and unrestrained assault on hospitals, schools and the general civilian population. In only one instance (September 1965: 40,000 killed and 31,000 wounded) has Hanoi provided totals on the alleged number of casualties inflicted by the air war. During 1966 North Vietnam made no statements on the total number of casualties sustained by the population as a result of U.S. bombings.

Although the relative number of estimated casualties per sortie has remained stable, the total estimate of casualties inflicted on North Vietnam in 1966 has increased over the 1965 estimates. There has also been a significant shift in the distribution of casualties from Military personnel to civilians. The changes in distribution and size of the

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estimate are primarily related to the decreased emphasis on attacks against
 CS targets (especially military facilities) and the substantial increase
 in the armed reconnaissance program. Based on sample data, through the
 first nine months of 1966, North Vietnamese casualties -- both civilian
 and military -- are estimated to have been about 15,700, with some 40
 percent killed and 60 percent wounded.

Estimated Casualties Resulting from Rolling Thunder, 1965-66

| | <u>1965</u> | <u>1966</u> | <u>Total</u> |
|----------------------|---------------|---------------|---------------|
| Civilians | | | |
| Fixed targets | 2,000 | 700 | 2,700 |
| Armed reconnaissance | <u>4,000</u> | <u>11,200</u> | <u>15,200</u> |
| | 6,000 | 11,900 | 17,900 |
| Military | | | |
| Fixed targets | 4,300 | 400 | 4,700 |
| Armed reconnaissance | <u>2,900</u> | <u>3,400</u> | <u>6,300</u> |
| | 7,200 | 3,800 | 11,000 |
| GRAND TOTALS | <u>13,200</u> | <u>15,700</u> | <u>28,900</u> |

About 70 percent of the casualties in 1966 were civilians in contrast
 to 45 percent in 1965. Armed reconnaissance accounted for 93 percent of
 the total casualties in 1966 as versus 52 percent in 1965. A good number
 of the civilians killed or injured in 1966 were for the most part engaged
 in maintaining the logistic supply lines in North Vietnam.

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The casualty figures can at best be rationalized in the following manner. In a country where over 350,000 people die each year of natural causes the impact of 12,000 civilian casualties annually does not appear to be an attrition of considerable proportions. In fact, it is believed that the number of annual accidental deaths in North Vietnam still exceed the current estimate of civilian deaths caused by the Rolling Thunder Program.

3. Civilian and Military Casualties

B. Fixed Targets

In the past year the Rolling Thunder JCS fixed target program has changed considerably in both size and scope. Some 2,000 attack sorties were directed against JCS targets in 1966, as versus 8,700 flown in 1965. Generally, JCS strikes in 1965 were directed against facilities in areas with relatively low population densities, whereas the growing scarcity of unstruck JCS targets this year has resulted in a restrained bombing program against more lucrative targets in areas having much higher population densities (e.g. Hanoi and Haiphong) and in ~~restricks~~ against those facilities hit in 1965.

It is estimated that at a minimum some 700 civilian and 400 military casualties were inflicted on North Vietnam as a by product of attacks on JCS targets in 1966. In an absolute sense this compares favorably with

the 2,000 civilian and 4,300 military casualties estimated to be inflicted by the 1965 JCS target campaign. It should be noted, however, that North Vietnam incurred casualties at the rate of .5 per attack sortie against JCS targets in 1965, and at the rate of .6 per attack sortie in 1966. The increase in the sortie-casualty ratio undoubtedly reflects the above mentioned change in the population densities of the new target systems put under attack in 1966.

(1) Casualty Prediction Methodology for Targeted Areas

Three additive and one weighting factor were used to determine casualty estimates for the individual fixed targets. DIA analysts define the first three factors as being the immediate target area, the spill over area, and the peripheral area. A fourth factor is discussed later.

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Military analysts decided that in theory all bombs dropped on target should fall within a circular error of probability equal to 600 feet in diameter. Within this area a distinction is made between the target and spill over area. An additional distinction is also made for bombs falling outside the circular error of probability.

(a) Target area

To determine the maximum number of casualties within the targeted area the number of people residing in the relevant

area is multiplied by the ratio of the total average lethal area of the bombs impacting within the target area. An account is also taken of the weapons which overlap in effects.

(b) Spillover area

Probable maximum casualties in the spillover area are found by multiplying the average lethal area of the bombs impacting in the spillover area (in millions of square feet) by the population density of the area (in people per million square feet).

(c) Peripheral area

The procedures used to estimate casualties in the peripheral target areas in North Vietnam are based on World War II data contained in the U.S. Strategic Bombing Survey of March 1947. World War II bombing of Japan caused some 550,000 casualties of which 250,000 were fatalities. A total of 2,100,000 buildings were destroyed by these bombings. The Japanese expected their urban areas to be struck and their air warning system was developed to provide early warning.

The buildings in North Vietnam are considered to be nearly equivalent to those found in Japan during World War II. The North Vietnamese are equally aware of U.S. bombing, but, since some of the targets are comparatively isolated, the North Vietnamese warning system may not be as effective as the Japanese system. In North Vietnam, however, few incendiary type bombs have been dropped, and targets generally are not located in as

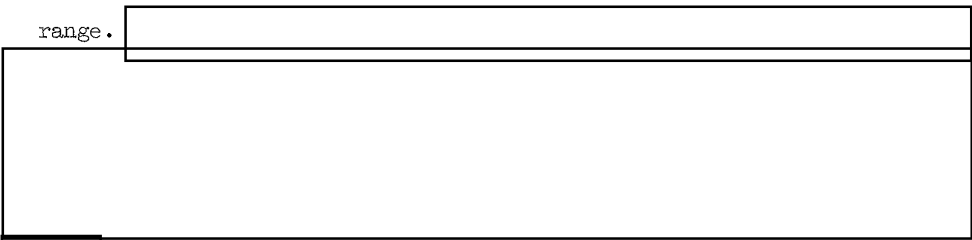
densely a populated area. Consequently, it is considered reasonable to base estimates of North Vietnamese casualties on the Japanese World War II ratio. Thus, one may expect about .25 casualties per structure destroyed. The minimum casualty figure is derived by multiplying the number of destroyed buildings outside of the spillover area by .25.

DIA casualty estimates for any given JCS facility are derived by adding the estimates for casualties in the immediate target, spillover and the peripheral areas. The immediate target and spillover casualty estimates are theoretically maximum losses and must be deflated by a factor of ten to get a maximum and minimum estimate of casualties. The 10:1 ratio is used because in theory unwarned personnel are 10 times more vulnerable to casualties than are warned personnel under similar attack conditions. Since the peripheral casualty estimate is a minimal figure it must be multiplied by 10 to establish a maximum and minimum

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range.

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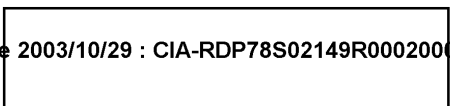
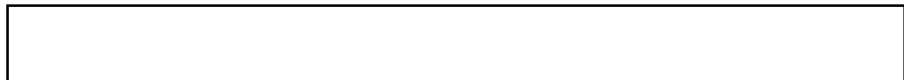


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initial attacks on TCS targets have inflicted casualties that are

nearly four times greater than the minimum DIA post-strike estimate of casualties. Consequently, the minimum DIA casualty estimates for the respective targets were used as a basis for adjusted estimates. Attacks

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against previously unstruck JCS targets hit in 1966 were ~~weighted~~ by a factor of four. Facilities hit in both years were credited with the minimal estimate for purposes of the 1966 casualty figure. This was done to take account of the probability that inhabitants residing in areas previously attacked would either move out or construct adequate shelter. The results of the exercise are shown below:

Estimated Civilian and Military
Casualties DRV: Inflicted by Strikes on JCS Targets 1966

| <u>JCS Fixed Target System</u> | <u>Military</u> | <u>Civilian</u> | <u>Total</u> |
|--|-----------------|-----------------|--------------|
| Barracks/supply depots/ ammunition depots | 300 | 50 | 350 |
| POL storage | 50 | 100 | 150 |
| Power plants | -- | 80 | 80 |
| Airfields | 20 | -- | 20 |
| Bridges | -- | 180 | 180 |
| Railyards | -- | 200 | 200 |
| Ports | <u>30</u> | <u>90</u> | <u>120</u> |
| | 400 | 700 | 1,100 |

3. Civilian CasualtiesC. Small pre-briefed Non-JCS Targets

In the past year it is estimated that some 1,200 casualties were inflicted on the North Vietnamese civilian population as a consequence of the armed reconnaissance attacks against small pre-briefed non-JCS targets. These facilities were for the most part targets of secondary importance but were attacked as fixed targets. Casualty estimates were made on the basis as the four factor analysis explained in the methodology in 3Bl. Since no estimate of this type exists for 1965 it is impossible to put the current casualty estimate in perspective. A tabulation of the targets and the respective casualties is presented below.

Civilian Casualty Estimate
for Small Pre-briefed Non-JCS Targets, 1966

| | |
|---------------|--------------|
| Ports | 30 |
| POL | 180 |
| Storage areas | 800 |
| Rail yards | 100 |
| Bridges | 90 |
| | <u>1,200</u> |

3. Civilian-Military CasualtiesD. Armed Reconnaissance

During 1966 the armed reconnaissance program over North Vietnam changed considerably when contrasted with the operation conducted in 1965. Some 57,500 armed reconnaissance sorties were flown this year as versus 25,300 in 1965. Since its inception the armed reconnaissance program has been gradually expanded to cover nearly the entire expanse of North Vietnam. The program remains, however, one with the limited goals of minimizing civilian casualties and maximizing damage to the infiltration-transportation network.

It is estimated that some 10,000 civilian and 3,400 military casualties were inflicted on North Vietnam as a consequence of the armed reconnaissance program in 1966. This represents a considerable increase over the estimated 4,000 civilian and 2,900 military casualties in 1965. Relatively, however, the casualty/sortie rate has remained stable. In 1966 casualties were inflicted at the rate of .23 per sortie as versus .27 in 1965. The stability of the sortie/casualty rate undoubtedly reflects improved North Vietnamese air warning and civilian defense measures and the continued efforts by the USAF and USN to minimize casualties as the tempo of the airwar increases.

(1) Methodology(a) Civilian Casualties

Three factors were employed to estimate civilian casualties inflicted by the armed reconnaissance program in 1966.

A daily casualty factor was derived [redacted] for a representa-
tive route package. This factor was then expanded to cover all of the
six route packages in North Vietnam. Modifying indexes were calculated
to reflect the varying population densities and sorties flown in the
respective route packages in 1966. The adjusted daily route package
casualty figures were then multiplied by the number of days of air
operation in the specific route packages. This exercise is shown in
the tables below.

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Estimated Civilians Killed By Air DRV: Inflicted by Armed Reconnaissance, Jan-Sep 1966

| Route Package | (KBA Ratio-day) | X (Population Density Index) | X (Armed Recon.Index) | = KBA Value/Day | X (# Days Air Operations) | = Total Civilians KBA* |
|---------------|-----------------|------------------------------|-----------------------|-----------------|---------------------------|------------------------|
| I | (3.5) | (.40) | (2.03) | =2.84 | 243 | =690 |
| II | (3.5) | (1.00) | (1.00) | =3.50 | 243 | =840 |
| III | (3.5) | (.63) | (.76) | =1.67 | 243 | =400 |
| IV | (3.5) | (2.10) | (.46) | =3.38 | 243 | =800 |
| V | (3.5) | (.23) | (.20) | =.16 | 243 | = 30 |
| VI A+B | (3.5) | (1.31) | (.29) | =1.32 | 183 | =240 |
| Total | | | | | | <u>3,000</u> |

* Rounded.



Estimated Civilians Wounded by Air DRV: Inflicted by Armed Reconnaissance, Jan-Sep 1966

| Route Package | (WBA Ratio) day | X (Population Density Index) | X (AR Index) | = WBA Value/Day | X (# Days Air Operations) | = Total Civilians WBA* |
|---------------|--------------------|------------------------------|--------------|-----------------|---------------------------|------------------------|
| I | (8) | (.40) | (2.03) | = 6.50 | 243 | = 1,580 |
| II | (8) | (1.00) | (1.00) | = 8.00 | 243 | = 1,950 |
| III | (8) | (.63) | (.76) | = 3.83 | 243 | = 940 |
| IV | (8) | (2.10) | (.46) | = 7.73 | 243 | = 1,880 |
| V | (8) | (.23) | (.20) | = .37 | 243 | = 90 |
| VI AB | (8) | (1.31) | (.29) | = 3.04 | 183 | = 560 |
| Total | | | | | | <u>7,000</u> |

* Rounded.

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Average daily casualties for the thirty day period were

2.2 killed by air (KBA) and 6.7 wounded by air (WBA).

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an atrocity factor was also

included in the daily casualty figures. It was assumed that one atrocity

bombing occurred in each route package each month. An average atrocity

figure (2.6/day) was calculated

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assuming half the casualties were killed and half wounded. The

final daily casualty rates for civilians as a consequence of the armed

reconnaissance were estimated to be 3.5 KBA and 8.0 WBA in route package

two.

(b) Military Casualties

The problems encountered in deriving a credible estimate of military casualties inflicted by armed reconnaissance were

insoluble.

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A methodology employing tabulated results of the armed reconnaissance program weighted the destroyed and damaged figures with DIA estimates of casualties per truck and for other facilities. In two specific categories, trucks and watercraft, the casualty weights were decreased

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It should be pointed out, however, that at best this estimate represents a very crude estimate.

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Small Targets of a Military and Military Associated
Nature Attacked on Armed Reconnaissance

| | <u>Destroyed and Damaged</u> | | <u>Military Casualties</u> |
|-------------------|----------------------------------|------|----------------------------|
| Barracks | 80 | x .1 | = 10 |
| Supply warehouses | 138 | x .1 | = 15 |
| Misc. buildings | 4,640 | x .1 | = 470 |
| Radar Com. | 78 | x .1 | = 10 |
| Truck parks | 92 | x .1 | = 10 |
| AAA sites | 568 | x .1 | = 60 |
| Trucks | 3,096 | x .5 | =1560 |
| Watercraft | 2,071 | x .5 | =1040 |
| RR cars | 2,234 | x .1 | 225 |
| | | | <u>3,400*</u> |

* Rounded.

E. Limitations of the Data

In a country such as North Vietnam where the casualty figures of the French-Indochinese are still held as a state secret there appears to be little to gain from deducing casualty figures from NorthVietnamese newspaper articles, radio broadcasts, and protests to the ICC.

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(4) Radio, Press and Official Claims

The North Vietnamese radio and press in 1966 continued to give vague and emotional accounts of US air strikes and damage. There have been no cumulative statements of casualties from Hanoi since September 1965 when Egyptian journalists were reportedly told that 40,000 North Vietnamese had already been killed and 35,000 wounded. The Hanoi news media was, as expected, of no value in estimating casualties.

The few recent official claims of casualties indicate that the toll in human lives isn't too high. A letter in May 1966 from the

Hanoi Red Cross to the International Committee of the Red Cross in Geneva specifically cited 239 civilian casualties inflicted since 31 January 1966, although implying many more. In October 1966 Hanoi also claimed that 300 school children and 30 teachers had been killed by the US aircraft.

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