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THE SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301

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MEMORANDUM FOR THE PRESIDENT

SUBJECT: False Alerts (U)

My last memorandum on this subject was on July 2. In that memorandum I summarized the corrective actions underway to prevent false missile warning displays like those which resulted in alerts of Strategic Air Command bomber crews on June 3 and 6. The purpose of this memorandum is to provide an update on the status of those actions. (U)

Subsequent to the June 6 false warning, Aerospace Defense Command (ADCOM) suspended operation of the NORAD Missile Warning Computer System (427M) as its primary means for providing missile warning data and attack assessment to other US and Canadian command centers. While the factors which contributed to the false alerts on June 3 and 6 are being corrected, NORAD is providing such data to its customers via a completely different computer, the Minimum Essential Back-up (MEBU) computer. (C)

I believe there were three major contributors to the false alert events of June 3 and 6: (1) a physical electronic failure in a circuit board of the 427M system, (2) computer programs which lacked sufficient error detection capability to prevent spurious data from being transmitted to NORAD's customers, and (3) lack of a monitoring system which would permit NORAD personnel -- whose mission it is to provide accurate warning data and attack assessment -- to examine what they were sending to their customers. All three of these discrepancies require correction, but had any one of them been resolved prior to 3 June, the false alerts either would not have occurred or would have been resolved more expeditiously. (S)

Analysis of the June 3 and 6 events has all but convinced ADCOM and the independent team of computer experts from the private sector that the failure was associated with a specific micro-electronic integrated circuit in a particular data communications interface device at NORAD. Nevertheless, the actual physical phenomenon which caused that circuit to produce the spurious signals on June 3 and 6 is still unknown. There are 552 circuit boards in the 427M which are generally similar in design and fabrication (commercial rather than military quality) to the one that failed on June 3 and 6. These boards, used as interfaces throughout the 427M system, remain the primary vulnerability of the 427M today. Since these boards cannot be quickly redesigned and replaced, it is imperative that we take a very conservative approach to error detection and correction in the system's computer programs. (S)

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 Reason 5

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Error Detection (U)

When the spurious signals were transmitted to NORAD's customers on June 3 and 6, error checking throughout the missile warning system was totally inadequate. Relatively simple error checks in the data stream which would detect random errors were removed and restored by the computer system as data messages were routed through various elements of the system. Although (as a result of changes made since the incidents) such simple error checks are now carried consistently through the 427M system and through the computers at the receiving command centers, these checks are inadequate to prevent bursts of errors from producing false data messages as occurred on June 3 and 6. That is, if the 427M were on-line today and the same failure that occurred on June 3 and 6 were to recur, it is highly likely that some erroneous messages would again be transmitted and appear on the displays of NORAD's customer command centers. (S)

The solution to this problem is the incorporation of a very powerful error-detection technique known as cyclic redundancy codes (CRC) into the computer programs of the missile warning system. Installation of CRC will delay the return to full operation of the more capable 427M for another three months, but I believe it is essential that we do so in order to provide acceptable assurance that bursts of errors caused by circuit failures will not cause false data messages to be sent. (C)

Quality Control (U)

It is the responsibility of the people on duty in the NORAD Cheyenne Mountain Complex (NMC) to provide valid, accurate warning information to the other command centers as well as to provide a NORAD assessment. Yet prior to June 6 the crew on duty in the NMC had no way of inspecting the data they were transmitting to their customers; they had to assume that the data they were seeing displayed were the same as those which were being transmitted to the other command centers. This, we are now well aware, was an erroneous assumption, but the fact that the people most qualified to analyze the data discrepancy on June 3 and 6--the people in the NORAD Cheyenne Mountain Complex--were isolated from observation of the false data being sent to their customers delayed expeditious resolution on the spot of the false alert which ensued. (S)

To address this problem we are in the process of installing monitoring devices on the data lines exiting the NORAD Cheyenne Mountain Complex. These devices will provide audible and visual alarms to the Systems Controller and the Missile Warning Officer at NORAD whenever a warning message is transmitted to the National Military Command Center or to Strategic Air Command Headquarters. The NORAD Systems Controller and the Missile Warning Officer can then expeditiously examine the validity of such messages and quickly advise the receiving command center should the message be false. (C)

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The independent team of computer experts from the private sector concluded, as I had, that it is unlikely that a system as large and complex as the NORAD missile warning system can be made completely failure-proof. Nevertheless, I find some reassurance in the following general conclusion from their report: "The checks and balances and practices are such that the events of June 3rd and June 6th, by themselves, could not have led to an improper use of nuclear weapons." But we need to improve the system and our procedures. We have done so and will make further improvements. (S)

Harold Brown

*The deficiencies
were/are
serious -
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