

MEMORANDUM

NATIONAL SECURITY COUNCIL

SECRETURGENT INFORMATION

August 31, 1973

DOS REVIEWED 16 MAR 2011 NO OBJECTION TO DECLASSIFICATION

MEMORANDUM FOR DR. KISSINGER

FROM: PHIL ODEEN *PO*

SUBJECT: Poseidon Reliability Problems

OSD REVIEWED 15-Mar-2011: NO OBJECTION TO DECLASSIFICATION

As we reported to you several months ago, the Poseidon missile has encountered reliability problems during its operational test phase. As a result of the difficulties, the Navy suspended the flight testing of operational missiles in March to conduct an intensive investigation of the failures.

The Poseidon problem has come to light as a result of a recent Orr Kelly story in the Star (at Tab A). Kelly's source was the testimony of the Navy's Poseidon project manager earlier this spring before the House and Senate Armed Services Committees. Kelly had to do a little guessing to piece together his story from the testimony since much of the information was deleted before the transcript is made public. Without the full story Kelly concluded that 14 of 24 Poseidon operational test firings (58 percent) were failures. The expected reliability of Poseidon is 80 percent.

The 14 Failures

In fact, the fourteen test flights identified in the testimony were flights on which anomalies prevented all of the re-entry bodies from impacting on the target. The Navy classified the fourteen flights as follows:

-- Eight were clear failures. The missiles failed in first or second stage flight, or during the bus phase prior to releasing the RVs.

-- Four were considered partial successes. These involved failures in some of the individual RVs during re-entry and, in one case, a guidance problem which resulted in some of the RVs failing to get off the bus. However, ⁱⁿ all four cases most of the RVs were deployed successfully and impacted on the target.

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-- Two were considered no test. In two flights there were apparently erroneous indications of malfunctions and the missiles were automatically destroyed. Reconstruction of the flights and detailed analysis of the telemetry shows no indication of missile malfunctions. It is believed that the malfunctions occurred in the missile destruct system installed in the missile for flight testing.

A more accurate accounting of the operational test program would judge eight or ten of the 24 tests as failures yielding a success rate of 58 - 64 percent.

However, in addition to the operational testing, the Navy has been conducting its Demonstration and Shakedown tests (DASO), 23 of 28 DASO tests were successful (a success rate of 82 percent).

Why the Big Difference in Results?

The major difference between the DASO missiles and Operational test (OT) missiles is that OT missiles have been deployed in the fleet and maintained there for at least a year. The Navy believes the answer to the differing success rates for DASO and OT missiles lies in the maintenance environment encountered by the operational missiles in the fleet rather than in any differences in design or production. No single cause has been identified for the failures. The components causing failure are generally those that are worked on in the fleet (e. g., electronics packages) or are exposed to sailors performing maintenance on the missile. As an example, one missile failure was attributed to a loose hose attached to a hydraulic power unit on the first stage motor. On investigation, loose hoses were found on a number of other missiles and it was determined that sailors performing maintenance on the missiles were frequently using the hose as a hand hold.

These types of subtle variances from established maintenance procedures are sufficient to cause occasional failures. The Navy has isolated a number of changes to maintenance procedures and a few minor design changes (e. g., to make certain components more sailor-proof) and is continuing its investigation of others.

A Recall of Poseidon?

Kelly's story says that the Navy Poseidon project manager (Rear Admiral Levering Smith) has urged the Navy to bring all the Poseidon missiles back to tear them apart, test them, and fix them ("like automobile recalls")

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but has been overruled. Smith has made no such recommendation and he and other Navy officials deny that there have been any differences between them in the handling of the Poseidon problem.

Nevertheless as missile changes are identified, Poseidon missiles will be recycled from the fleet to shore facilities where the changes will be implemented. This type of activity is always a part of shaking down a new weapon system and working the bugs out. It occurs most frequently in the first few years of deployment but continues throughout the life of the system (e.g., we are still making occasional changes to ten year old systems like Polaris A-3 and Minuteman II).

The Poseidon problem is one more example of the need for testing our complex weapon systems in the most realistic possible manner. The recent DOD proposal (after your repeated prodding) to test Minuteman from operational silos is clearly a step in the right direction. In addition, the testing question is relevant to SALT, where we frequently hear from DDR&E or JCS that the Soviets could deploy new or modified systems without testing them in their operational configuration. The Soviets could, of course, elect to deploy systems not fully tested, but as the Poseidon problem illustrates, their confidence in using such systems in a first strike would be seriously degraded.

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WASHINGTON

Poseidon 'Recall' Urged

By Orr Kelly
Star-News Staff Writer

A "recall" of the Poseidon missiles that now make up nearly half of the United States' underseas strategic force has been recommended by the admiral in charge of the program because of a series of test failures.

Navy officials refused to discuss details of the problem, but it has been learned that information supplied to the Senate Armed Services Committee indicates that 58 percent of the missiles tried out in operational tests experienced some kind of failure.

While this indicates the missiles are less reliable than they should be, Navy officials emphasized that, if the missiles had been fired in anger, most of their warheads would have exploded on or close to their targets.

"I have seen enough to believe that it would be appropriate for us to recall essentially all of the missiles that are now deployed to disassemble and to test the various components, perhaps even to tear down some of those components and get at the basic bits and pieces," Rear Adm. Levering Smith, Polaris-Poseidon project manager, told the Senate committee in heavily-censored testimony on May 16.

SMITH has not received a go-ahead, however, for what he described as a process "like the automobile recalls."

Instead, Smith, who works under the chief of naval materiel, has been told to bring in a limited number of missiles, take them apart and try to find out what has caused the test failures, according to Rear Adm. R. Y. Kaufman, who is the director of the strategic submarine division under the chief of naval operations.

A reporter who asked to talk to Smith was referred to Kaufman. In response to questions, Kaufman said a decision will be made as to whether the problem with missile reliability is serious enough to warrant the drastic action recommended by Smith.

In any event, Kaufman said, there is no plan to pull in Poseidon submarines on an emergency basis and strip them of their missiles. The full recall, if it occurs, would be conducted over a period of several years, he

said, even though Smith testified he had recommended that it be done in a one-year period.

THE U.S. has 41 missile-launching submarines, each carrying 16 missiles. Of these subs, the 31 newer ones are being converted to carry the long-range Poseidon, each of which can deliver 10 relatively small nuclear warheads. So far, 19 of the Polaris submarines have been converted to carry the Poseidon and 14 of them have been deployed.

The missiles are made by the Lockheed Missiles and Space Division at Sunnyvale, Calif.

Both Smith, in his testimony before the Senate and House Armed Services Committees, and Kaufman, in the interview, emphasize that the Poseidons are still reliable enough to be of very serious concern to the Soviet Union.

"The Russians would be very foolish to not pay full attention to it," Smith told the House Committee.

Kaufman said the Poseidons have fallen a relatively small percentage below the desired reliability goal. He said they were still very reliable, considering that each sub can carry a total of 160 individual warheads each big enough to destroy a city.

TESTS of the Poseidon were halted last spring after 52 firings of production missiles from submarines. Of those firings, 28 were during demonstration and shakedown operations and 24 were tests from operational submarines.

In the tests, which cost about \$1 million apiece, not counting the costs of the missile, there were 19 failures of one sort or another — a failure rate of 36 percent, according to figures supplied to the Senate committee.

In the 28 demonstration tests, there were failures in five cases — a failure rate of 18 percent. Smith told the committee he was shooting for a reliability rate of a little over 80 percent, so the demonstration tests apparently fell within the permissible area.

But in the 24 operational tests, there were 14 failures — a failure rate of 58 percent — according to the information supplied to the committee.

Although details of the

failures were deleted, along with most other specific figures, a careful analysis of the information indicates that four of the five demonstration failures occurred in the first or second stages of the missile flight rather than in the separation and delivery of the payload.

IN THE operational tests, however, at least eight of the problems apparently occurred in the separation of the payload or the delivery of the independent re-entry vehicles to their targets — in the MIRV (multiple, independently targetable re-entry vehicle) part of the missile.

Kaufman declined to detail the problem, but he said trouble with the missile itself tended to be much more serious than problems in the re-entry system, which could involve misplacement of a single one of a number of warheads.

The Armed Services and Appropriations Committees were informed orally of the missile problem last spring. But there apparently was an effort to keep the public from learning about the recommended recall.

During the House hearings, one congressman commented, "All we need is a little word about the recalling the weapons the way General Motors is recalling the Cadillacs and so forth, and we would really have a problem."

"That is why we have tried to be completely open and frank about it but not put it in the newspaper," Smith replied.

IRONICALLY, it was a newspaper picture, showing a missile tumbling out of control in a test on May 9, that sparked intensive questioning by members of the two Armed Services committees in the following week.

It is not clear at this point, Smith told the House committee, whether poor design, poor quality control or a combination of the two is involved.

"I would observe, he said, "that the missiles and the components met all of the specified tests that were called for by the contract. So to the extent that it is a failure and a fault, it is a joint failure of the contractor and the government."

A major problem in developing and deploying costly missiles such as the Poseidon, he explained, is that some faults may not show up until there have been a significant number of operational tests because the testing and quality control necessary to eliminate all possible problems would not be worth the cost.

WHAT particularly concerned him and other Navy officials Smith told the committee, is that the Poseidon may turn out to be like the Polaris A-3, "where we have a sizable number of individual faults, each of which may only occur one time out of 100 or something like that."

Both Smith and Kaufman said the cost of inspecting and fixing the missiles has not yet been determined.

While the program of converting Polaris submarines to carry the advanced Poseidon is not yet complete, the United States is already moving ahead on the development of the new Trident missile and submarine, with the first sub to be deployed before the end of this decade.

Kaufman said the problems with the Poseidon did not indicate any difficulty with the Trident, which is still under development. In fact, he said, there was still enough time so faults found in the Poseidon could be avoided in the Trident.

IN ADDITION to problems with the Polaris A-3 and the new trouble with the Poseidon, the United States also had severe reliability problems with the land-based Minuteman II missile. In the case of the Minuteman, a kind of "recall" program was used to correct the faults and they appear to have been eliminated in the newer Minuteman III.

In contrast to the submarine-launched missiles, which are routinely tested from operational submarines, there has never been a true operational test of a Minuteman because such tests would involve sending missiles flying over populated parts of this country.

Thus, there has always been the unanswered question of whether operational tests of the Minuteman would reveal unexpected problems of the kind that have shown up in the operational tests of the submarine-launched missiles.