20 Mishaps That Might Have Started Accidental Nuclear War

by Alan F. Phillips, M.D.

Ever since the two adversaries in the Cold War, the U.S.A. and the U.S.S.R., realized that their nuclear arsenals were sufficient to do disastrous damage to both countries at short notice, the leaders and the military commanders have thought about the possibility of a nuclear war starting without their intention or as a result of a false alarm. Increasingly elaborate accessories have been incorporated in nuclear weapons and their delivery systems to minimize the risk of unauthorized or accidental launch or detonation. A most innovative action was the establishment of the "hot line" between Washington and Moscow in 1963 to reduce the risk of misunderstanding between the supreme commanders.

Despite all precautions, the possibility of an inadvertent war due to an unpredicted sequence of events remains as a deadly threat to both countries and to the world. That is the reason I am prepared to spend the rest of my life working for abolition of nuclear weapons.

One way a war could start is a false alarm via one of the warning systems, followed by an increased level of nuclear forces readiness while the validity of the information was being checked. This action would be detected by the other side, and they would take appropriate action; detection of the response would tend to confirm the original false alarm; and so on to disaster. A similar sequence could result from an accidental nuclear explosion, or any great unexpected explosion, in either country. The risk of such a sequence developing would be increased if it happened during a period of increased international tension.

On the American side many false alarms and significant accidents have been listed, ranging from trivial to very serious, during the Cold War. Probably many remain unknown to the public and the research community because of individuals' desire to avoid blame and maintain the good reputation of their unit or command. No doubt there have been as many mishaps on the Soviet Side. Two have become known in the west, and are included below.

Working with any new system, false alarms are more likely. The rising moon was misinterpreted as a missile attack during the early days of long-range radar. A fire at a broken gas pipeline was believed to be enemy jamming by laser of a satellite’s infrared sensor when those sensors were first deployed.

The risks are illustrated by the following selection of mishaps. If the people involved had exercised less caution, or if some unfortunate coincidental event had occurred, escalation to nuclear war can easily be imagined. Details of some of the events differ in different sources: where there have been disagreements, I have chosen to quote those from the carefully researched book, "The Limits of Safety", by Scott D. Sagan. Sagan gives references to original sources in all instances.

This selection represents only a fraction of the false alarms that have been reported on the American side; and others probably remain hidden in records that remain classified.

1) November 5, 1956: Suez Crisis Coincidence

British and French Forces were attacking Egypt at the Suez Canal. The Soviet Government had suggested to the U.S. that they combine forces to stop this by a joint military action, and had warned the British and French governments that (non-nuclear) rocket attacks on London and Paris were being considered. That night NORAD HQ received messages that:

(i) unidentified aircraft were flying over Turkey and the Turkish air force was on alert

(ii) 100 Soviet MIG-15's were flying over Syria

(iii) a British Canberra bomber had been shot down over Syria

(iv) the Soviet fleet was moving through the Dardanelles.

It is reported that in the U.S.A. General Goodpaster himself was concerned that these events might trigger the NATO operations plan for nuclear strikes against the U.S.S.R.

The four reports were all shown afterwards to have innocent explanations. They were due, respectively, to:

(i) a flight of swans

(ii) a routine air force escort (much smaller than the number reported) for the president of Syria, who was returning from a visit to Moscow

(iii) the Canberra bomber was forced down by mechanical problems

(iv) the Soviet fleet was engaged in scheduled routine exercises.

2) November 24, 1961: BMEWS Communication Failure

On the night of November 24, 1961, all communication links went dead between SAC HQ and NORAD. The communication loss cut off SAC HQ from the three Ballistic Missile Early Warning Sites (BMEWS) at Thule (Greenland), Clear (Alaska), and Fylingdales (England). There were two possible explanations facing SAC HQ: either enemy action, or the coincidental failure of all the communication systems, which had redundant and ostensibly independent routes, including commercial telephone circuits. All SAC bases in the United States were therefore alerted, and B-52 bomber crews started their engines, with instructions not to take off without further orders. Radio communication was established with an orbiting B-52 on airborne alert, near Thule. It contacted the BMEWS stations by radio and could report that no attack had taken place.

The reason for the "coincidental" failure was that the redundant routes for telephone and telegraph between NORAD and SAC HQ all ran through one relay station in Colorado. At that relay station a motor had overheated and caused interruption of all the lines. [NOTE: Long after I wrote this, a reader informed me that he was a technician at Plattsburgh Air Force Base at the time. The order reached that Base as an "Alpha" alert, the highest level, at which nuclear-armed bombers were to take off, fly direct to their targets without waiting at the fail-safe point for further orders, and drop their bombs. Before any bomber could take off the prompt correction arrived, making it a third-level or "Cocoa" alert, at which the bombers stayed on the runway with engines running and waited for further orders. If even one bomber had taken off, it might have been very difficult to recall it or stop it.]

*THE **CUBAN MISSILE CRISIS** LASTED FOR THE TWO WEEKS OF 14-28 OCTOBER 1962. MANY DANGEROUS EVENTS TOOK PLACE IN RELATION TO THE CRISIS, SOME OF THEM BECAUSE OF CHANGES MADE TO ENHANCE MILITARY READINESS. ELEVEN HAVE BEEN SELECTED:*

3) August 23, 1962: B-52 Navigation Error

SAC Chrome Dome airborne alert route included a leg from the northern tip of Ellesmere Island, SW across the Arctic Ocean to Barter Island, Alaska. On August 23, 1962, the crew of a nuclear-armed B-52 bomber made a navigational error and flew a course 20 degrees too far towards the north. They approached within 300 miles of Soviet airspace near Wrangel Island, where there was believed to be an interceptor base with aircraft having an operational radius of 400 miles.

Because of the risk of repetition of such an error, in this northern area where other checks on navigation are difficult to obtain, it was decided to fly a less provocative route in the future. However, the necessary orders had not been given by the time of the Cuban missile crisis in October 1962, so throughout that crisis the same northern route was being flown 24 hours a day

4) August-October, 1962: U2 Flights into Soviet Airspace

U2 high altitude reconnaissance flights from Alaska occasionally strayed unintentionally into Soviet airspace. One such episode occurred in August 1962. During the Cuban missile crisis on October of 1962, the U2 pilots were ordered not to fly within 100 miles of Soviet airspace.

On the night of October 26, for a reason irrelevant to the crisis, a U2 pilot was ordered to fly a new route, over the north pole, where positional checks on navigation were by sextant only. That night the aurora prevented good sextant readings and the plane strayed over the Chukotski Peninsula. Soviet MIG interceptors took off with orders to shoot down the U2. The pilot contacted his U.S. command post and was ordered to fly due east towards Alaska. He ran out of fuel while still over Siberia. In response to his S.O.S., U.S. F102-A fighters were launched to escort him on his glide to Alaska, with orders to prevent the MIG's from entering U.S. airspace. The U.S. interceptor aircraft were armed with nuclear missiles. These could have been used by any one of the F102-A pilots at his own discretion.

5) October 24, 1962: A Soviet Satellite Explodes

On October 24, a Soviet satellite entered its own parking orbit, and shortly afterward exploded. Sir Bernard Lovell, director of the Jodrell Bank observatory wrote in 1968: "the explosion of a Russian spacecraft in orbit during the Cuban missile crisis ... led the U.S. to believe that the USSR was launching a massive ICBM attack". The NORAD Command Post logs of the

dates in question remain classified, possibly to conceal reaction to the event. Its occurrence is recorded, and U.S. space tracking stations were informed on October 31 of debris resulting from the breakup of "62 BETA IOTA."

6) October 25, 1962: Intruder in Duluth

At around midnight on October 25, a guard at the Duluth Sector Direction Center saw a figure climbing the security fence. He shot at it, and activated the "sabotage alarm". This automatically set off sabotage alarms at all bases in the area. At Volk Field, Wisconsin, the alarm was wrongly wired, and the klaxon sounded which ordered nuclear armed F-106A interceptors to take off. The pilots knew there would be no practice alert drills while DEFCON 3 was in force, and they believed World War III had started.

Immediate communication with Duluth showed there was an error. By this time aircraft were starting down the runway. A car raced from command center and successfully signaled the aircraft to stop. The original intruder was a bear.

7) October 26, 1962: ICBM Test Launch

At Vandenburg Air Force Base, California, there was a program of routine ICBM test flights. When DEFCON 3 was ordered all the ICBM's were fitted with nuclear warheads except one Titan missile that was scheduled for a test launch later that week. That one was launched for its test, without further orders from Washington, at 4 a.m. on the 26th.

It must be assumed that Russian observers were monitoring U.S. missile activities as closely as U.S. observers were monitoring Russian and Cuban activities. They would have known of the general changeover to nuclear warheads, but not that this one was an exception and the launch was a routine test.

8) October 26, 1962: Unannounced Missile Launch

During the Cuba crisis, some radar warning stations that were under construction and near completion, were brought into full operation as fast as possible. The planned overlap of coverage was thus not always available.

The Titan test launch of Mishap #7, above, also caused temporary concern at Moorestown Radar site until its course could be plotted and showed no predicted impact within the United States. It was not until after this event that

the potential for a serious false alarm was realized, and orders were given that radar warning sites must be notified in advance of test launches, and the countdown be relayed to them.

9) October 26, 1962: Malmstrom Air Force Base

When DEFCON 2 was declared on October 24, solid fuel Minuteman-1 missiles at Malmstrom Air Force Base were being prepared for full deployment. The work was accelerated to ready the missiles for operation, without waiting for the normal handover procedures and safety checks. When one silo and missile were ready on October 26 no armed guards were available to cover transport from the normal separate storage, so the launch-enabling equipment and codes were all placed in the silo. It was thus physically possible for a single operator to launch a fully armed missile at a SIOP target.

During the remaining period of the Crisis the several missiles at Malmstrom were repeatedly put on and off alert as errors and defects were found and corrected. Fortunately no combination of errors caused or threatened an unauthorized launch, but in the extreme tension of the period the danger can be well imagined.

10) October, 1962: NATO Readiness

It is recorded on October 22, that British Prime Minister Harold MacMillan and NATO Supreme Commander General Lauris Norstad agreed not to put NATO on alert in order to avoid provocation of the U.S.S.R. When the U.S. Joint Chiefs of Staff ordered DEFCON 3, Norstad was authorized to use his discretion in complying. Norstad did not order a NATO alert. However, several NATO subordinate commanders did order alerts to DEFCON 3 or equivalent levels of readiness at bases in West Germany, Italy, Turkey, and United Kingdom. This seems largely due to the action of General Truman Landon, CINC U.S. Air Forces Europe, who had already started alert procedures on October 17 in anticipation of a serious crisis over Cuba.

11) October, 1962: British Alerts

When the U.S. SAC went to DEFCON 2, on October 24, the British Bomber Command was carrying out an unrelated readiness exercise. On October 26, Air Marshall Cross, CINC of Bomber Command, decided to prolong the exercise because of the Cuba crisis, and later increased the alert status of British nuclear forces, so that they could launch in 15 minutes.

It seems likely that Soviet intelligence would perceive these moves as part of a coordinated plan in preparation for immediate war. They could not be expected to know that neither the British Minister of Defence nor Prime Minister MacMillan had authorized them.

It is disturbing to note how little was learned from these errors in Europe. McGeorge Bundy wrote in "Danger and Survival" (New York: Random House 1988), "the risk [of nuclear war] was small, given the prudence and unchallenged final control of the two leaders."

12) October 28, 1962: Moorestown False Alarm

Just before 9 a.m., on October 28, the Moorestown, New Jersey, radar operators informed the national command post that a nuclear attack was under way. A test tape simulating a missile launch from Cuba was being run, and simultaneously a satellite came over the horizon. The operators had become confused. and they reported by voice line to NORAD HQ that impact was expected 18 miles west of Tampa at 9:02 a.m. The whole of NORAD was alerted, but before irrevocable action had been taken it was reported that no detonation had occurred at the predicted time, and Moorestown operators reported the reason for the false alarm.

During the incident overlapping radars that should have confirmed or disagreed were not in operation . The radar post had not received routine information of satellite passage because the facility carrying out that task had been given other work for the duration of the crisis.

13) October 28, 1962: False Warning Due to Satellite

At 5:26 p.m. on October 28, the Laredo radar warning site had just become operational. Operators misidentified a satellite in orbit as two possible missiles over Georgia and reported by voice line to NORAD HQ. NORAD was unable to identify that the warning came from the new station at Laredo and believed it to be from Moorestown, and therefore more reliable. Moorestown failed to intervene and contradict the false warning. By the time the CINC, NORAD had been informed, no impact had been reported and the warning was "given low credence." *END OF CUBA CRISIS EVENTS.*

14) November 2, 1962: The Penkovsky False Warning

In the fall of 1962, Colonel Oleg Penkovsky was working with the Soviets as a double agent for the (U.S.) CIA. He had been given a code by which to warn the CIA if he was convinced that a Soviet attack on the United States was imminent. He was to call twice, one minute apart, and only blow into the receiver. Further information was then to be left at a "dead drop" in Moscow.

The pre-arranged code message was received by the CIA on November 2, 1962.

It was not known at the CIA that Penkovsky had been arrested on October 22. Penkovsky knew he was going to be executed. It is not known whether he had told the KGB the meaning of the code signal or only how it would be given, nor is it known exactly why or with what authorization the KGB staff used it. When another CIA agent checked the dead drop he was arrested.

15) November, 1965: Power Failure and Faulty Bomb Alarms

Special bomb alarms were installed near military facilities and near cities in the U.S.A., so that the locations of nuclear bursts would be transmitted before the expected communication failure. The alarm circuits were set up to display a red signal at command posts the instant that the flash of a nuclear detonation reached the sensor and before the blast put it out of action. Normally the display would show a green signal, and yellow if the sensor was not operating or was out of communication for any reason.

During the commercial power failure in the NE United States, in November 1965, displays from all the bomb alarms for the affected area should have shown yellow. In fact, two of them from different cities showed red because of circuit errors. The effect was consistent with the power failure being due to nuclear weapons explosions, and the Command Center of the Office of Emergency Planning went on full alert. Apparently the military did not.

16) **January 21, 1968: B-52 Crash near Thule** Communication between NORAD HQ and the BMEWS station at Thule had 3 elements:

1. Direct radio communication.
2. A "bomb alarm" as described above.
3. Radio Communication relayed by a B-52 bomber on airborne alert.

On January 21, 1968, a fire broke out in the B-52 bomber on airborne alert near Thule. The pilot prepared for an emergency landing at the base. However the situation deteriorated rapidly, and the crew had to bale out. There had been no time to communicate with SAC HQ, and the pilotless plane flew over the Thule base before crashing on the ice 7 miles offshore. Its fuel and the high explosive component of its nuclear weapons exploded, but there was no nuclear detonation.

At that time, the "one point safe" condition of the nuclear weapons could not be guaranteed, and it is believed that a *nuclear* explosion could have resulted from accidental detonation of the high explosive trigger. Had there been a nuclear detonation even at 7 miles distant, and certainly if a bomber had crashed and a nuclear explosion had occurred nearer the base, all three communication methods would have given an indication consistent with a successful nuclear attack on both the base and the B-52 bomber. The bomb alarm would have shown red, and the other two communication paths would have gone dead. It would hardly have been anticipated that the combination could have been caused by accident, particularly as the map of the routes for B-52 airborne flights approved by the President showed no flight near to Thule. The route had been apparently changed without informing the White House.

17) October 24-25, 1973: False Alarm During Middle East Crisis

On October 24, 1973, when the U.N.-sponsored cease fire intended to end the Arab-Israeli war was in force, further fighting started between Egyptian and Israeli troops in the Sinai desert.

U.S. intelligence reports and other sources suggested that the U.S.S.R. was planning to intervene to protect the Egyptians. President Nixon was in the throes of the Watergate episode and not available for a conference, so Kissinger and other U.S. officials ordered DEFCON 3. The consequent movements of aircraft and troops were of course observed by Soviet intelligence.

The purpose of the alert was not to prepare for war, but to warn the U.S.S.R. not to intervene in the Sinai. However, if the following accident had not been promptly corrected then the Soviet command might have made a more dangerous interpretation.

On October 25, while DEFCON 3 was in force, mechanics were repairing one of the klaxons at Kinchole Air Force Base, Michigan, and accidentally

activated the whole base alarm system. B-52 crews rushed to their aircraft and started the engines. The duty officer recognized that the alarm was false and recalled the crews before any took off.

18) November 9, 1979: Computer Exercise Tape

At 8:50 a.m. on November 9, 1979, duty officers at 4 command centers (NORAD HQ, SAC Command Post, The Pentagon National Military Command Center, and the Alternate National Military Command Center) all saw on their displays a pattern showing a large number of Soviet Missiles in a full scale attack on the U.S.A. During the next 6 minutes emergency preparations for retaliation were made. A number of Air Force planes were launched, including the President's National Emergency Airborne Command Post, though without the President! The President had not been informed, perhaps because he could not be found.

With commendable speed, NORAD was able to contact PAVE PAWS early warning radar and learn that no missiles had been reported. Also, the sensors on the satellites were functioning that day and had detected no missiles. In only 6 minutes the threat assessment conference was terminated.

The reason for the false alarm was an exercise tape running on the computer system. U.S. Senator Charles Percy happened to be in NORAD HQ at the time and is reported to have said there was absolute panic. (But note that the military personnel directly involved acted promptly and correctly.) A question was asked in Congress. The General Accounting Office conducted an investigation, and an off-site testing facility was constructed so that test tapes did not in the future have to be run on a system that could be in military operation. That lesson could have been learned 17 years earlier (Mishap #12, 1962).

19) **June , 1980: Faulty Computer Chip** The Warning displays at the Command Centers mentioned in the last episode included windows that normally showed: 0000 ICBMs detected. 0000 SLBMs detected.

At 2:25 a.m. on June 3, 1980, these displays started showing various numbers of missiles detected, represented by 2's in place of one or more 0's. Preparations for retaliation were instituted, including nuclear bomber crews starting their engines, launch of Pacific Command's Airborne Command Post, and readying of Minutemen missiles for launch.

It should not have been difficult to assess that this was a false alarm because the numbers were always 2's, in randomly varying positions.

While the cause of the false alarm was still being investigated 3 days later, the same thing happened and again, despite the risks, preparations were made for retaliation. On this occasion it appears to have been because of a military error that the situation worsened.

The cause was a single faulty chip that was failing in a random fashion. The basic design of the system must have been faulty, to allow this single failure to cause a deceptive display at several command posts.

The following incident is added to illustrate that, even now the Cold War is over, errors can still cause concern. There are still 20,000 nuclear weapons deployed; Russia and USA are believed still to be at a "launch on warning" posture.

20) January, 1995: Russian False Alarm

On January 25, 1995, the Russian early warning radars detected an unexpected missile launch near Spitzbergen. The estimated flight time to Moscow was less than 10 minutes. The Russian President, the Defense Minister and the Chief of Staff were informed. The early warning and the control and command center switched to combat mode.

Within 5 minutes, the radars determined that the missile's impact would be outside the Russian borders.

The missile was Norwegian, and carried only scientific instruments for atmospheric research. On January 16, Norway had notified 35 countries including Russia that the launch was planned. Information had apparently reached the Russian Defense Ministry, but failed to reach the on-duty personnel of the early warning system. (See article in the November 1997 Scientific American, by Bruce G. Blair, Harold A. Feiveson and Frank N. von Hippel.)

Comment and Note On Probability

The probability of actual progression to nuclear war on any one of the occasions listed may have been small, due to planned "fail-safe" features in the warning and launch systems, and to responsible action by those in the chain of command when the fail-safe features had failed. However, the accumulation of small probabilities of disaster from a long sequence of risks adds up to serious danger.

There is no way of telling what the actual level of risk was in these mishaps but if the chance of disaster in every one of the 20 incidents had been only 1 in 100, it is mathematical fact that the chance of surviving all 20 would have been 82%, i.e. about the same as the chance of surviving a single pull of the trigger at Russian roulette played with a 6-shooter. With a similar series of mishaps on the Soviet side: another pull of the trigger. If the risk in some of the events had been as high as 1 in 10, then the chance of surviving just seven such events would have been less than 50:50.

ADDENDUM

Another event has recently come to light which, if the descriptions of it received in the west are true, must have been a very narrow escape. Here is an account derived from study of several accounts that have been published:

21) September 1983, Colonel Petrov

On Sept. 26, 1983, Lieutenant Colonel Stanislav Petrov disobeyed orders and saved the world from a nuclear holocaust. Just after midnight, 44 year old Petrov was the commander on duty in an early warning bunker south of Moscow. It was a time of high tension between the Americans and the Soviets because the Americans were about to deploy Pershing missiles in Europe in response to Soviet deployment of SS-20 ballistic missiles. The Soviets were worried that a planned NATO exercise in Europe might be a cover for a pre-emptive strike, and just three and a half weeks prior, the Soviets had shot down Korean Air Flight 7, killing all 269 people on board. Petrov's early warning center picked up signals from a new series of Soviet satellites. Suddenly the klaxon alarm went off.

The computer displays indicated that a missile was headed towards the Soviet Union from Malmstrom Air Force Base in Montana. Petrov knew he had orders to forward the warning of an attack immediately to the Politburo so that Soviet missiles would be launched in retaliation. He knew that this massive response would trigger the launch of thousands more US missiles. The nuclear disaster would cause millions of deaths, nuclear winter, and mass starvation on the whole planet. Petrov, knowing that the new satellites had been rushed into service, waited to see if the signal was an error. Then to his horror, another missile was detected, and another, until five missiles appeared to be headed toward the Soviet Union. His control board was flashing СТАРТ (START), and the klaxons were deafening.

The Minister of Defense and others in the Soviet General Staff also received the alarms and were calling Petrov. He had less than ten minutes to make a decision. He reasoned that no one would start a war with only five missiles, and despite pressure from the Minister, decided not to take action. Five minutes after the alarm started, Petrov was certain it was an error. Later, the cause was thought to be sunlight reflected on high altitude clouds over Malmstrom, shining into the sensors on the satellite. Petrov was investigated by the military, and although he was not punished, he was regarded as not trustworthy in the position he held and was transferred to a less sensitive post, and eventually dismissed from the military.

On May 24, 2004 Colonel Petrov was given the World Citizen Award by the San Francisco-based Association of World Citizens. (Personal communication, Dr. Mary-Wynne Ashford; see also David Hoffman, Washington Post Foreign Service, Wednesday, February 10, 1999; Page A19)

Acronyms

BMEWS: Ballistic Missile Early Warning Site CIA: Central Intelligence Agency CINC: Commander-in-Chief DEFCON: Defense Readiness Condition (DEFCON 5 is the peacetime state; DEFCON 1 is

maximum war readiness). HQ: Headquarters ICBM: Intercontinental Ballistic Missile (land based) KGB: Komitet Gosudarstvennoi Bezopaznosti (Soviet Secret Police and Intelligence) NORAD: North American Aerospace Defense Command PAVE PAWS: Precision Acquisition of Vehicle Entry Phased-Array Warning System SAC: Strategic Air Command SIOP: Single Integrated Operational Plan SLBM: Submarine Launched Ballistic Missile

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