

NUCLEAR SAFETY

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SEPTEMBER-OCTOBER 1966

DEPARTMENT OF THE AIR FORCE
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Policy Statement

USAF NUCLEAR SAFETY is published to assist Commanders, Nuclear Safety Officers, Flight Surgeons and others having Nuclear Safety responsibilities in establishing and implementing an aggressive, effective Nuclear Safety Program.

It is also designed to give guidance to the major air commands, primarily by:

- Supplementing existing Nuclear Safety publications.
- Pointing out Nuclear Safety deficiencies in the form of case studies.
- Spotlighting potential nuclear accident/incident/deficiency sources or "soft areas" so that effective action can be taken.
- Summarizing status of Nuclear Weapon System Safety Group and Nuclear Reactor System Safety Group activities.
- Analyzing accidents/incidents/deficiencies.

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An Editorial



For nearly twenty-one years, the Air Force has sustained a remarkable nuclear weapon safety record. Although there have been accidents and incidents of lesser significance, continuous attention to detail by all concerned has shown that minor events can be prevented from becoming serious enough to affect adversely our operational posture with nuclear weapons. Within the past few years, increased emphasis has been given to conventional operations; however, this has in no way reduced the importance of our nuclear posture, nor is there any less need for the effective nuclear safety program required to assure this posture.

Political repercussions from a major nuclear weapon accident which could result in operational limitations have always been a concern. For example, even though there were no civilian casualties and little real property damage, the recent accident in Spain resulted in the withdrawal of the rights for overflight of Spain with nuclear weapon loaded aircraft.

Past nuclear weapon accidents have been the by-product of deficiencies in either the aircraft or missile carrier, or operating crew procedures; nevertheless, potentially serious incidents continue to occur in loading, maintenance, and other ground operations. Thus, it is appropriate to scrutinize closely all your management practices to assure that established nuclear safety efforts continue at the highest level. If deviations are found, they must be corrected. These elements are paramount in maintaining a sound nuclear capability:

- The personal interest and attention of commanders at all echelons to this matter.
- Absolute compliance with nuclear weapon system safety rules and other directives affecting the safe operation of these systems.
- The physical safety of nuclear weapons attained through the highest quality programs in related fields of flying, missile, and ground safety.
- The prompt and accurate reporting of all nuclear safety incidents, deficiencies, and accidents.
- The adequacy and frequent test of nuclear accident response and explosive ordnance disposal plans.

HEWITT T. WHELESS, Lt General, USAF
Assistant Vice Chief of Staff

~~CRITICAL INFORMATION~~
~~DESIGN INFORMATION~~
~~FOR THE USE OF THE AIR FORCE~~

THIS DOCUMENT CONSISTS OF 38 PAGES
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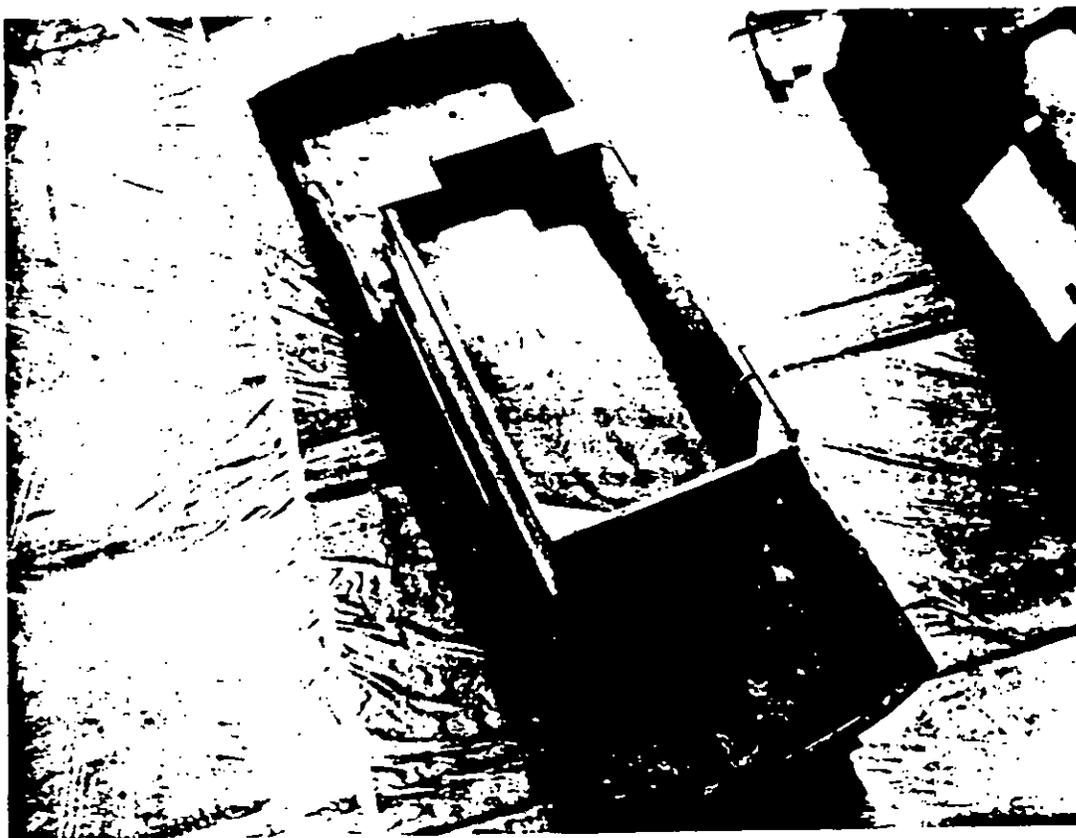
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An aftermath account
of the world's most
newsworthy thermo-
nuclear weapon

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BROKEN ARROW **AFTERMATH**

*Engineering and Analysis Division
Directorate of Nuclear Safety*



Unit No. 4 after removal of non-warhead components.
Moisture in sand at near end.

~~SECRET~~ BROKEN ARROW AFTERMATH

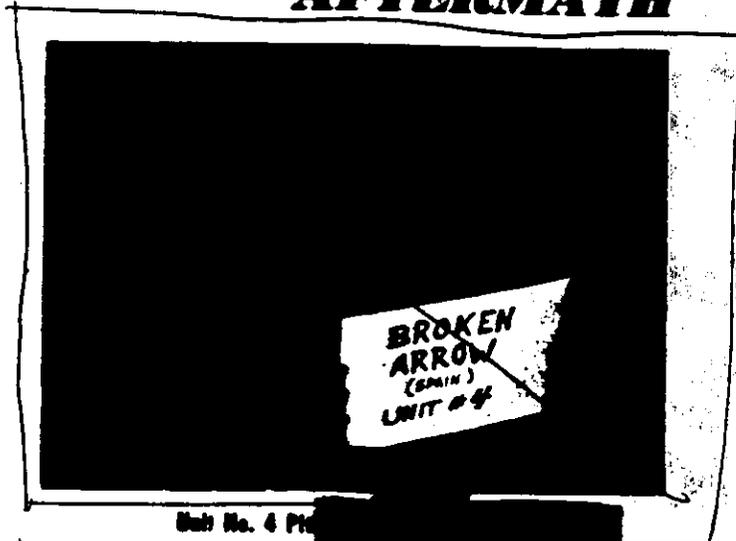
(See the article on the Spanish Broken Arrow which appeared in Volume 51.—Ed.)

~~(S) (C) (P)~~ Two Mason and Hanger-Silas Mason Company, Inc., employees lifted the hemisphere of high explosives gently from the nuclear warhead and placed it on a sponge-rubber cushioned handling table. High explosives and safety experts from the Atomic Energy Commission, Los Alamos Scientific Laboratory, Sandia Corporation, and the military services carefully inspected the hemisphere. The high explosive material was in good condition—but thoroughly soaked with salt water!

~~(S) (C) (P)~~ The Mk 28 FI bomb from which the high explosive hemisphere was removed had become the world's most newsworthy thermonuclear weapon. For purposes of identification this weapon was labeled No. 4. An article in the May-June 1966 issue of this magazine explained the story of what happened when the weapon was lost on 17 January 1966, later found, and then recovered. It had been exposed to severe shock when the B-52G carrying it collided with a KC-135 refueling aircraft about 30,000 feet above Palomares, Spain. A piece of the B-52 slammed into the bottom of the tail ballistic case section, driving one fin inward, cutting through the aluminum weapon skin, shearing off the tail closing plate and gouging both the 16-foot and 64-foot parachutes out of the weapon. High winds aloft drifted the parachute-drogued Mk 28 FI bomb about eight miles before it entered the Mediterranean Sea near Spanish fisherman Francisco Simo y Ort's boat.

~~(S) (C) (P)~~ The weapon sank rapidly and settled to the bottom of the sea, sliding down an underwater canyon to its resting place 2,500 feet deep. There it remained until located 57 days later by ALVIN, a deep-submergence vehicle operating in Navy Task Force 65. Recovery of the Mk 28 FI bomb was initially unsuccessful when the cable lifting the weapon separated and the bomb again fell to the floor of the Mediterranean Sea in water about 2,850 feet deep. The ALVIN, the ALUMINAUT, and the CURV (Cable-Controlled Underwater Recovery Vehicle) teamed up to successfully recover the weapon on 7 April 1966. The weapon was rendered safe and prepared for shipment to an AEC Modification Center for complete post-mortem along with the other weapons involved in the accident.

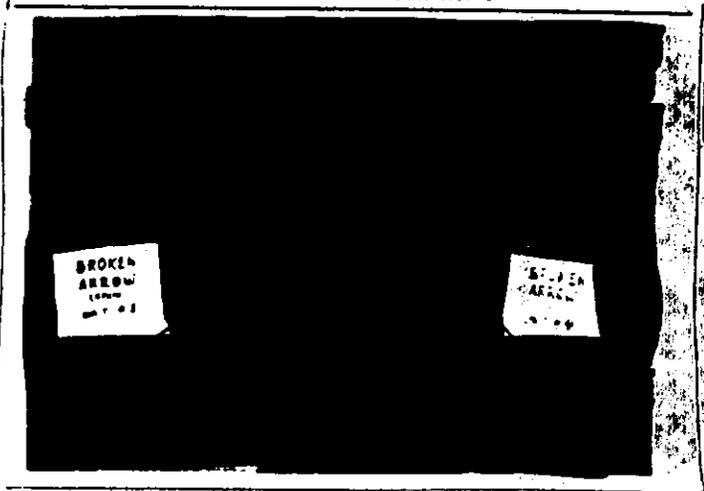
~~(S) (C) (P)~~ Weapon No. 1 was recovered intact at the accident scene, having been retarded by its 16-foot parachute when it was torn loose from the bomb bay of the B-52. Some components from



Unit No. 4 PFC ~~(S) (C) (P)~~



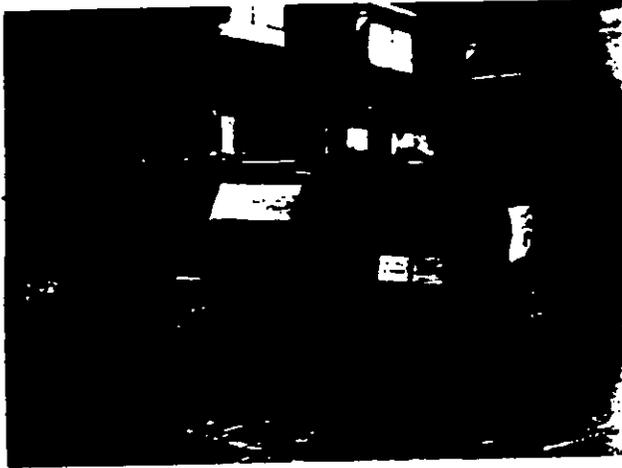
Fuze and PSC from Unit No. 4



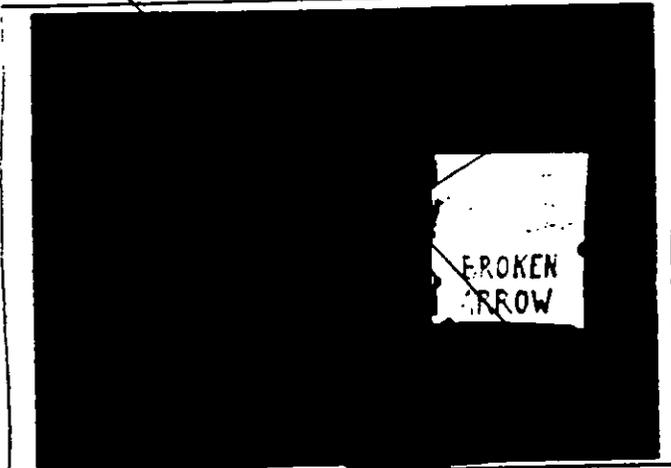
Warhead pressure covers from Units Nos. 1 and 4. Note deformation in No. 4.

Handwritten notes and markings, including the letters "MHP" and a circled "6".

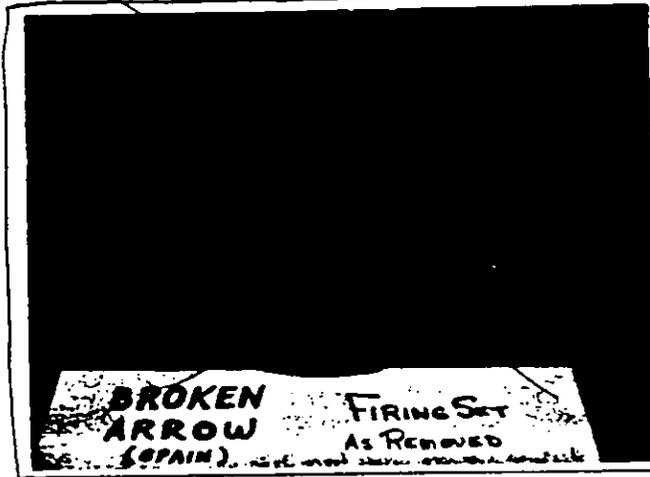
BROKEN ARROW ~~SECRET~~ AFTERMATH



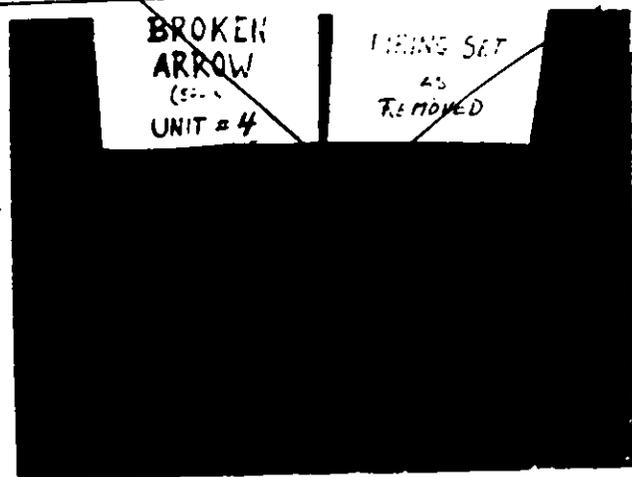
Unit No. 4 as received for unpacking.



Unit No. 4. Warhead with firing set exposed. Considerable moisture and silt. White foreign material appears to be wet desiccant.



Unit No. 1 Firing Set



Unit No. 4 Firing Set

Weapon No. 2 and 3 were recovered in the craters where their high explosives had exploded on impact. Weapon No. 4 was recovered intact, as noted above, from deep in the Mediterranean Sea.

~~(S)~~ The remnants of weapon Nos. 2 and 3, and the intact weapon No. 1, were moved by truck to the Spanish Air Base at San Javier, and then by air transport to Torrejon Air Base. The materials from each weapon were assembled and repackaged for airlift by the Military Airlift Command to an AEC Modification Center. The tail-closing plate from weapon No. 4, which was recovered during the land search, was returned to the Sandia Corporation in Albuquerque, New Mexico. The parachutes, in a 55-gallon drum, and weapon No. 4, in a modified J-79 engine container, were shipped by the navy Transport USS CASCADE to Quonset Point, Rhode Island, where MAC picked up the containers and airlifted them to an AEC Modification Center.

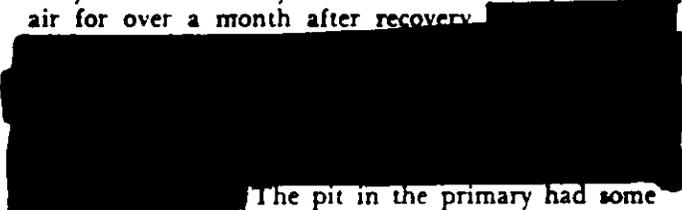
~~(S)~~ A preliminary meeting was convened by the AEC on 27 April 1966 to review the condition of the weapon material recovered from the accident. A tentative plan was outlined to study the recovered weapons, reclaim the fissionable materials, and dispose of the contaminated parts and other residue. On 9 and 11 May 1966, post-mortems were performed on weapon Nos. 4 and 1. Fuzing and firing components were removed and shipped to Sandia Corporation for component tests. The parachutes not contaminated by radioactive material were shipped to a detachment of the Air Force Systems

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BROKEN ARROW AFTERMATH

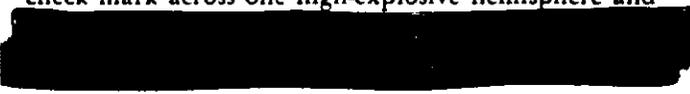
Command's Systems Engineering Group at Kirtland AFB, New Mexico, for testing and analysis.

~~(S)~~ Post-mortem revealed that weapon No. 4 was in good condition for a weapon that had been exposed to a mid-air collision, torn loose from the clip-in assembly, parachute-retarded from about 30,000 feet, dunked for 81 days in more than 2,500 feet of salt water, and dragged and dropped in silt on the floor of the Mediterranean Sea. The high explosive material in the primary was salt-water soaked, but intact. Some electrical connectors were rusty and corroded by the salt water and exposure to air for over a month after recovery.

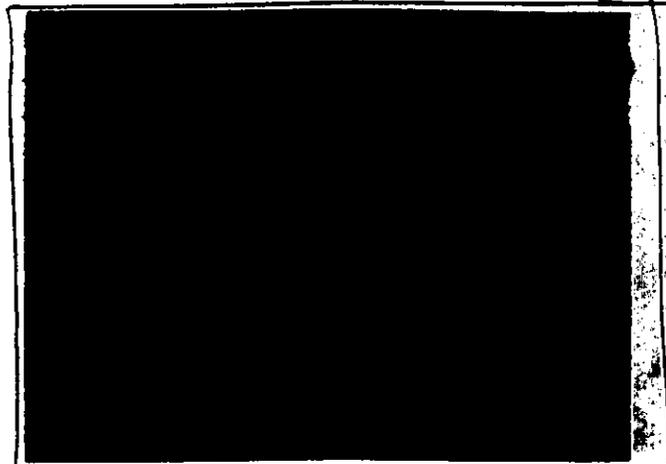


The pit in the primary had some rusty-colored corrosion on its exterior. It was still sealed and indicated the proper vacuum. There were no parts of the weapon contaminated with radioactive materials as the result of the accident.

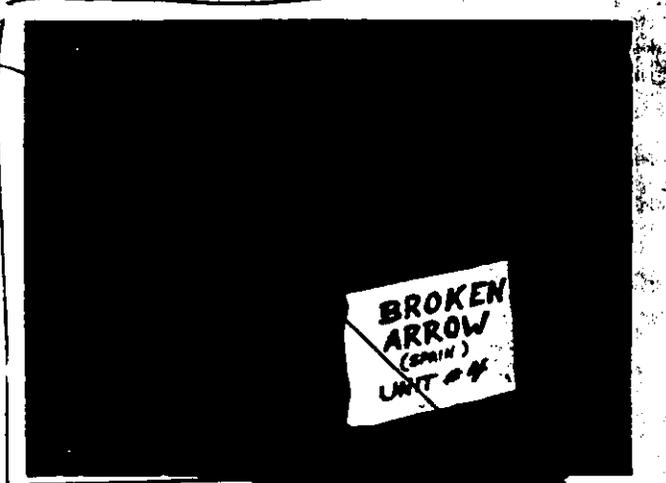
~~(S)~~ When the post-mortem was conducted on weapon No. 1 it was found to be in good condition for a weapon which had withstood an accident environment. Internal parts were clean and "like new." The only anomalies were a chord-like check mark across one high-explosive hemisphere and



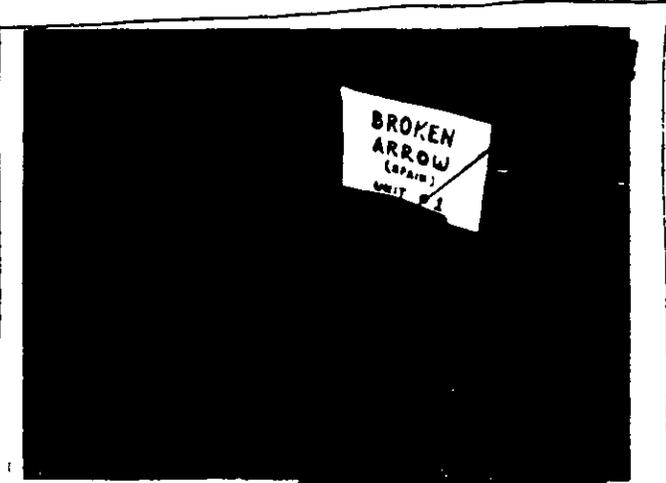
DNA
(b)(3)



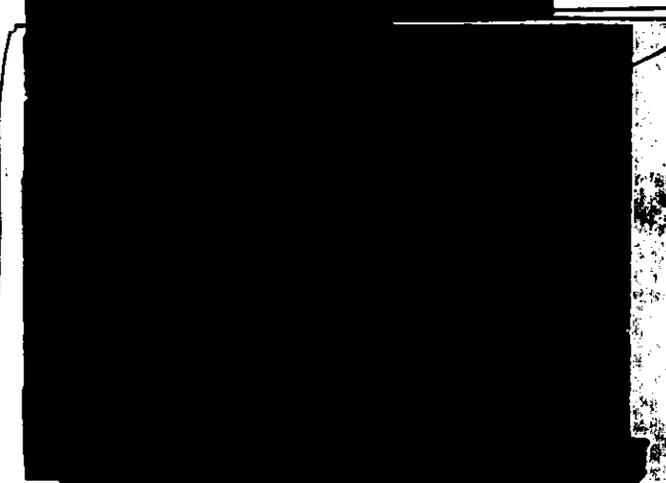
Unit No. 4 Close Up of Detector And Cable, showing Corrosion



Unit No. 4 Pit



Unit No. 1 Pit



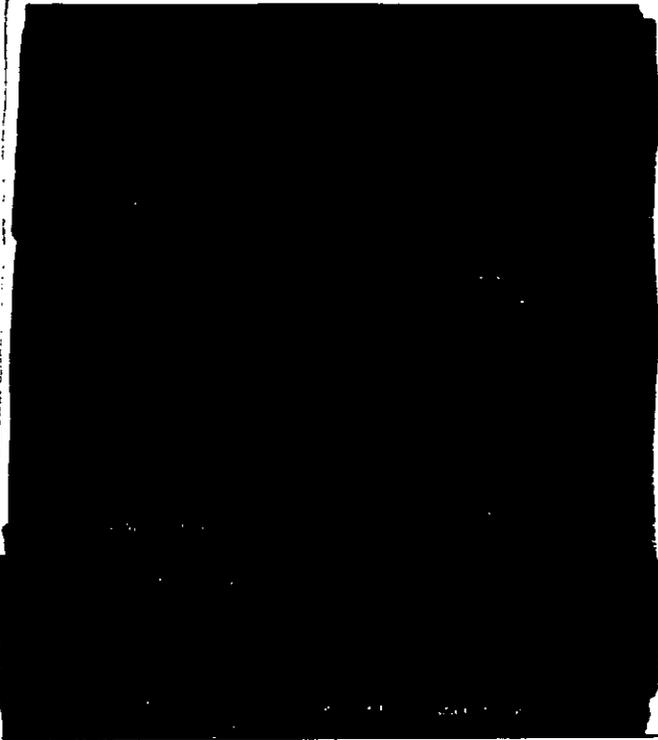
Unit No. 4 Close Up of Pit

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BROKEN ARROW AFTERMATH

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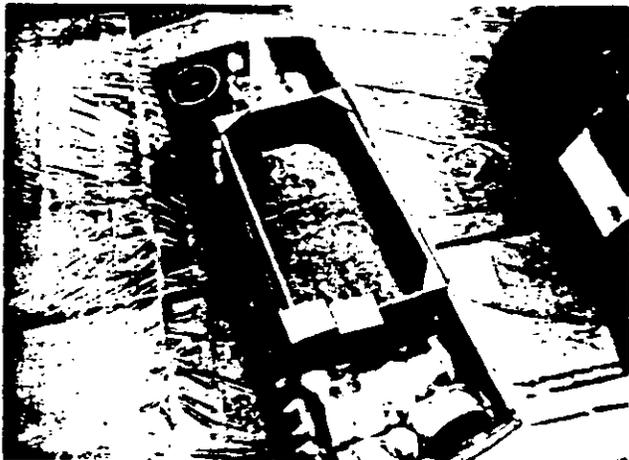
~~Unit No. 1~~

reclaimed or disposed of by the Atomic Energy Commission. Some of the non-nuclear components were contaminated when the one-point non-nuclear high-explosive detonations occurred, or when the components were assembled and transported with contaminated hardware. These components were either decontaminated for tear-down inspection or disposed of by the AEC. Components without contamination were shipped to the Sandia Corporation in Albuquerque where detailed analyses of the condition of the components were undertaken. Electrical components were tested using test equipment of the type employed during the stockpile sampling programs.

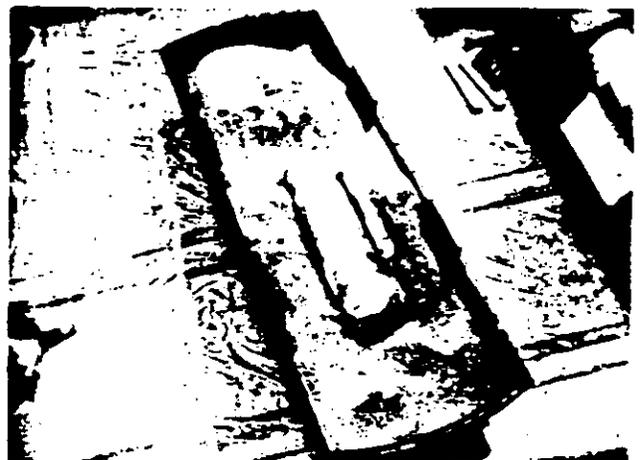
DWA
(b)(3)

~~(S)~~ The improvised method of packing the warhead from weapon No. 4 in dry sand in the J-79 engine container was acceptable. No evidence of either pyrophoric reaction or hydrolyzing was discovered during the post-mortem.

~~(S)~~ The weapon's grade materials in the nuclear components of all four weapons were



Unit No. 4. Packing arrangement of components as received.



Unit No. 4. Warhead after clearing of sand.

(Continued on Page 32)

"Pull-out Section"

(Pages 7-30 are unclassified, ~~For Official Use Only~~, and may be removed for wider dissemination.)



NUCLEAR SAFETY

VOLUME 52

SEPTEMBER-OCTOBER 1966

THE SUPERVISOR

Every aspect of safety in the USAF has a direct effect on operational capability. The supervisor, therefore, becomes a vital link in the accident/incident/deficiency prevention program since safety is an integral part of his normal duties. The supervisor who applies the principle that safety increases operational effectiveness is a key contributor to Nuclear Safety. Normally, he is the most knowledgeable individual present during weapon operations. He is, therefore, best equipped to insure that all associated activities are given optimum safety consideration.

The supervisor must insure that only qualified and reliable personnel perform the various weapon functions. Moreover, that these individuals are mentally and emotionally capable of carrying out their individual responsibilities. As the person most frequently in direct contact with these individuals, he is in the best position to make daily observations. (AFM 122-1)

CHARLIE SCHULTZ AND THE TRIPLANE

(The ADC ORI Team Chief, Col Jimmy J. Jumper, continues to write interesting and valuable articles containing material useful to people in the Nuclear Safety field as well as other safety activities. The following article appeared in the April 1966 issue of "Interceptor."—Ed.)

Somebody once asked us how come we inspect safety programs on fighter unit ORIs. Our answer was the obvious one. We want to make sure that combat resources aren't being needlessly wasted or exposed to risk. We make kind of a big thing of unit safety surveys when we inspect, and the other day we heard a story that justified our interest. It told how the whole thing began.

Back in the days of the Great War, Manfred Von Richthofen was a pretty well known fella—shot down 80 planes, had a catchy name, long scarf—everything going for him! But, when Manfred was the jagdstaffel new guy, he had trouble with his landings. Fact was, he couldn't land worth sour apples. Well, nobody hears much about him but there was a flying safety officer in Manfred's outfit named Charlie Schultz, and Charlie was worried about Manfred. After watching Manfred wipe out his second Einderker in as many days, Charlie wrote the Baron a letter. Charlie had a flair for colorful language. "Manny Baby: You fly like old people play soccer. This may come as a shock to you, sweetheart, but you're supposed to round out a Fokker before the wheels come into the cockpit. Now, I'm a reasonable guy. Manny, but you know what a grouch the oberkommander is—one more bash this year, baby, and old Charlie goes back to the Russian front. Now, gimme a break, Manny. Please start your roundouts higher! Charlie."

Now, ole Charlie didn't know it, but he had the start of a pretty good safety survey there. He saw a problem, wrote it down, and sent it to the guy who could do something about it. He got a quick response too!

The Baron had a flair for blunt language! "Schultz: Cool it, fink: Call me "Manny baby" one more time and you'll wish you were at the Russian front." Der Baron."

Well, Charlie—being a resourceful fellow who

hated cold weather—when his survey didn't get results, did the right thing again. He took follow-up action, this time enlisting the aid of a technical expert. He called up his old friend, Anthony Fokker. The phone call sounded something like this:

— Hello! Tony baby?

— This is Charlie—Charlie Schultz!

— No wait, Tony, don't hang up—there might be a contract in it for you.

— All right, Tony, I'm sorry I called you a crackpot when you told the staff you could make a machine gun that would fire through the propeller—OK?

— Listen, Tony, I got a problem. We got this new guy in the squadron named Richthofen. Yeah, you know, the one with the long scarf. Calls himself the Red Baron—big deal!

— Yeah. Well, anyway, this nut wipes out the landing gear about twice a week when he lands, but he's a big shooter and the boss wants to keep him around. So, I was wondering, Tony, if you could come up with some kind of gadget that would help get this screwball on the ground.

— Oh? You're already working on something?

— An airplane with what?

— With three wings? Oh, you are a card, Tony. Yes, that's very funny, but seriously, Tony, I'm in a jam.

— Oh, I see, you are serious.

— You say that third wing will give him the extra lift he needs to round out? Uh, Tony—you're not back on that cheap Dutch wine again, are you?

— I see. Well, if anybody can make it fly, Tony Baby, you're the man.

— You're going to call it what? The Fokker Triplane, huh?

— Yeah, that's great Tony. I mean we wouldn't want to call it the Fokker monoplane, now, would we?

— Well, listen, Tony, when you finish this thing, why don't you paint it red? That boob's gonna get blood all over it on his first landing anyway.

Now, everybody knows how well the Baron and the Triplane did, but very few historians realize that



it all came about as a result of Charlie Schultz's safety survey.

We get enthused about unit safety because being itinerant gumshoes ourselves, we felt that some type of self-inspection is needed in the squadrons. The safety survey is sort of a nice guy's inspection. Properly done, it benefits everybody.

We harass the safety guy on every ORI. Usually, the nuts-and-bolts parts of the safety programs, i.e., reporting, nuc-safe training and so forth, are pretty much standard. But, local surveys, which are the backbone of the safety program at some units, are given only lip service at others. It may be coincidence, but the outfits that use safety surveys effectively almost invariably have safer operations.

We're not going to tell you how to do it at your outfit—that's not our line of work. But, here's one good system we've seen work.

First, the safety officer sets up a schedule. He looks at a different element of the unit each month or at whatever time period he thinks is appropriate. He may, for example, decide to do the storage site in January. If so, he lets the OIC know about it well in advance.

Next, he makes up some kind of check list using publications that pertain to the function he's looking at. He uses inspection reports such as ORI/CI Blue

Well . . . would you believe that materiel failure was a CONTRIBUTORY cause?

Books as another guide for trouble-shooting. He gets expert help if he needs it in areas he's unfamiliar with, such as civil engineering or security. Then, he conducts the survey. If he's prepared, it doesn't take very long.

His next step is to prepare a brief report and send a copy to the section surveyed for corrective action. A copy also goes to the commander of any other agency that has to lend a hand to correct a gig. Finally, he makes a follow-up visit to insure that the gigs have been taken care of.

This sort of thing keeps everybody happy. The guy being surveyed is happy because it helps pinpoint problems that maybe he's too busy to notice; the commander's happy because he gets in-house corrective action. We're happy because our reports are shorter; and safety officers like Charlie Schultz are happy because they don't get sent to places like the Russian front.

By the way, we made up some of that story. There never was a guy named Richthofen—but Charlie Schultz was real.



PREPARE THE MAN

TRAINING NEWS

NUCLEAR SAFETY OFFICER (NSO)

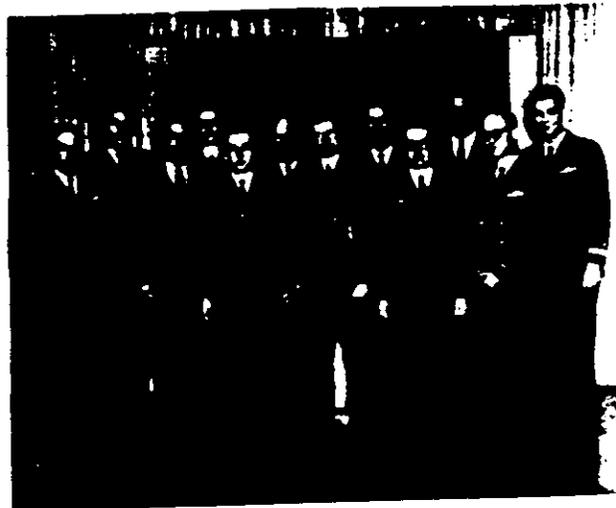
The commander should assign an NSO as either a special staff officer with whom he deals directly or within a Directorate of Safety which in turn is directly responsible to the commander. Past experience shows that when the NSO reports directly to the commander, fewer accidents/incidents/deficiencies occur. The higher the qualifications of the safety officer, the greater his potential for reducing the number of accidents/incidents/deficiencies. The assignment of highly qualified NSOs down through wing level or a level commensurate with the nuclear responsibilities of the command/wing — reporting directly to the commander's safety staff officer — is a basic concept of the USAF accident prevention philosophy. Consideration should also be given to the assignment of full-time NSOs at subordinate organizations, where warranted, particularly those in isolated locations.

Today's professional NSO is an expert who aids the commander by identifying and analyzing potential accident areas, and by recommending necessary corrective action. The NSO's duties normally are considered as staff duties, and his office should not be an action agency. If he were required to participate routinely in each weapon movement, loading, maintenance, function, crew briefing, etc., his efforts would be diluted and rendered ineffective. (AFM 122-1)

LTTC NSO CLASSES

The second TAC Troop Carrier Class graduated from the Nuclear Safety Officer Course at Lowry AFB on 21 June 1966. Capt Donne D. Viau of the 316th TCW at Langley AFB was the honor graduate.

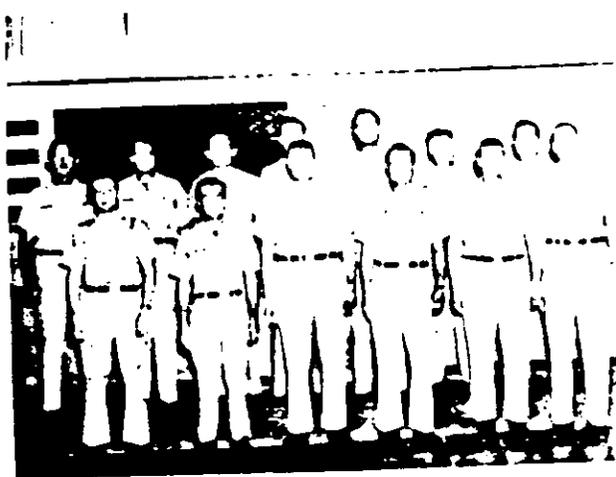
The field trip was conducted at the 813th Air Division (TAC) at Forbes AFB. Maj. K. E. Quinlan, the Chief of Safety at Forbes AFB, as well as being a class member, provided support for the class during its stay. According to the NSO Course instructors, the facilities, cooperation, and assistance provided were nothing short of outstanding. They also said that they sincerely appreciated the high degree of interest and motivation toward Nuclear Safety exhibited by the members of the class.



1st Defense Atomic Support Agency NSO Class, Lowry AFB. L. to r. Col E. Miller (Guest Graduation Speaker); Capt F. C. Lowler (USA); Capt R. L. Scott (USA); 2d Lt B. C. Head (USA); 1st Lt W. H. Haro (USAF); Lt Col T. M. Scott (USAF); 1st Lt C. W. Schoop, Jr (USAF); Maj R. Mace (USAF); Capt. D. A. Pearce (USAF); Maj W. W. DeLorme (USAF); CWO-4 H. S. Pickering (USN); Lt H. E. Staples (USN).



2nd TAC (Troop Carrier) Nuclear Safety Officers Class, Lowry AFB. L. to r. (first row): Capt J. J. Ruddy; Maj K. E. Quinlan; Capt C. F. Mourning. (Second row): Capt K. M. Goudelock; Maj W. Langer; Capt D. D. Viau (Honor Graduate).



2nd CONAC Nuclear Safety Officers Course, Lowry AFB. L. to r. (first row): Capt D. P. Lemme; Maj R. S. Briggs; Maj C. D. Mullins (Honor Graduate); Maj C. E. Horton; Maj G. D. Sharpe; Maj W. R. Hoeflinger. (Second row): Maj R. C. Bauley; Maj R. T. Knight; Maj D. L. Henry; Maj I. D. Richardson; Maj H. D. Edelman; Maj G. F. Cullen; Maj I. A. Nicholson.

TRAINING NEWS

Fifth AF Hosts PACAF NSO Course

Headquarters Fifth Air Force was host to the Pacific Air Force Nuclear Safety Officer Course (OTS-1955-6) from 14 February through 5 May 1966. The course was conducted by four instructors from Lowry AFB, Colorado. Under the program, four classes, each consisting of approximately 15 students were given training and instructions in Nuclear Safety procedures at Johnson AB, Japan. This course of instruction is part of an Air Force-wide program to prepare personnel in becoming better qualified in all phases of specialized safety functions.

Maj Gen Fred J. Ascani, Vice Commander, Fifth Air Force, was the guest speaker at the graduation ceremonies held for the first class. General Ascani stated:

" . . . the need for a sound and well-managed Safety Program at all levels of command has been accepted by the Air Force . . . the conflict in Southeast Asia and its conventional aspects has caused some people to advance the theory that our Safety Program can be placed in a secondary role. Quite to the contrary, the drain on our air power to support Southeast Asia has placed renewed emphasis on the requirement for a quality safety program.

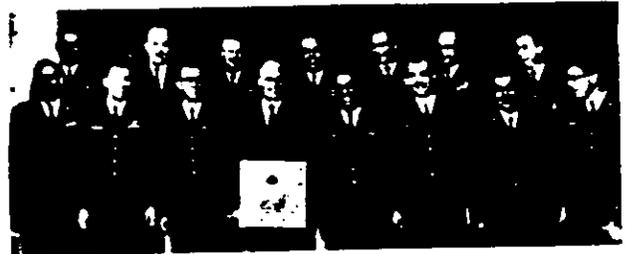
"We must insure that our operations are well planned and that we are capable of supporting general war plans with less aircraft and fewer people. This requirement has placed additional pressure on commanders, supervisors and individuals to increase their efficiency and awareness of safety."

At the conclusion of his address, General Ascani offered these challenges to the graduating students: "First, know your unit's mission and how the safety program fits into each segment of the mission. Second, know the people who support the mission. Third, be honest with your commander in pointing out weaknesses within the unit's safety plan. Finally, develop and sustain a positive attitude as to the methods in which the mission can be performed, problems can be resolved and still support the intent and purpose of our safety rules."



The three officers and one NCO which made up the team of instructors were: Capt Ronald E. Christensen, team chief, and his three able assistants, 1st Lt William A. Begalke, Jr, Lt. Robert S. Kase, and TSgt Robert D. Schultz.

Honor graduates and second in class standings were each given a pen and pencil set in recognition of their outstanding performances. In addition, each individual was given a certificate of completion attesting to their effort and ability to complete the course of instruction.

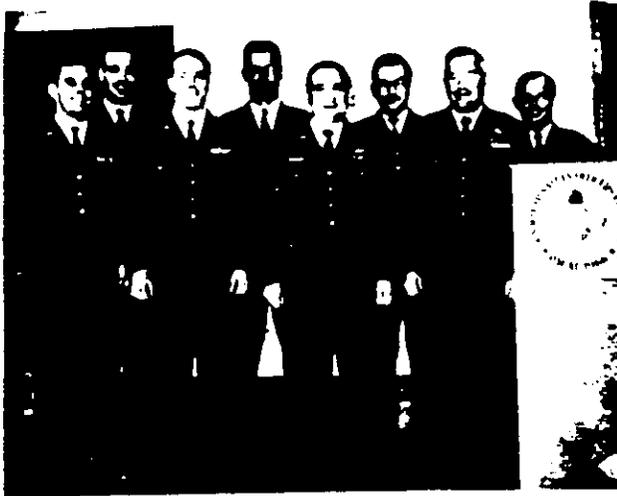


1st PACAF Nuclear Safety Officers Course. L. to r. (first row): SMSgt G. M. Hoy; Capt J. H. Conover; Lt T. S. Moughan, Jr; CDR W. C. Metcalf; Capt D. W. Foshee; Capt R. Call, Jr; Capt J. D. Miller; Lt L. E. Wirth. (Second row): MSgt T. J. Mullaney; Capt R. G. Wise; Maj L. Tarbutton; Capt E. V. Richardson; Maj H. M. Stout; TSgt F. E. Slater; Lt J. W. Amrine, Jr.

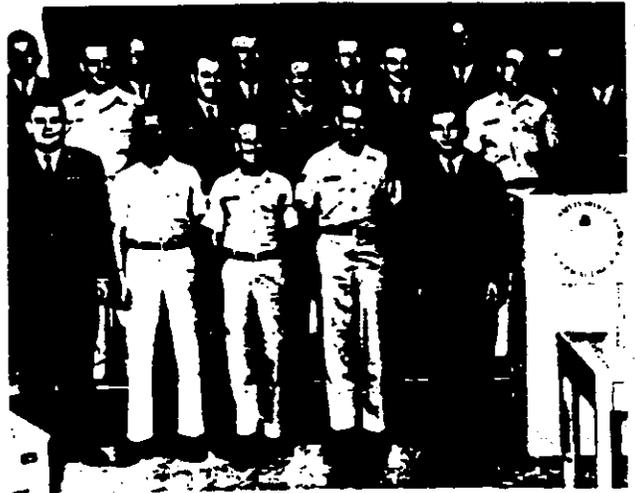


2nd PACAF Nuclear Safety Officers Course. L. to r. (first row): Capt R. E. Maher; Capt H. Waller; MSgt H. J. Gilliland; Capt R. H. Moon; CWO L. Dumand; CMSgt J. S. Scott. (Second row): Capt H. F. Johnson; SSgt D. Lovell; Capt R. L. Brooks; Lt B. Wolf; SMSgt J. R. Patterson; G. Booser (Civ).

TRAINING NEWS



3rd PACAF Nuclear Safety Officers Course. R. to l. (first row): Lt R. C. McKee, Capt W. J. Decanio; Lt Col J. P. Anderson; Capt F. G. Rosenbaum. (Second row): Lt J. A. Gallagher, C. Stratton; Lt J. R. Shater; Capt W. W. Boys.



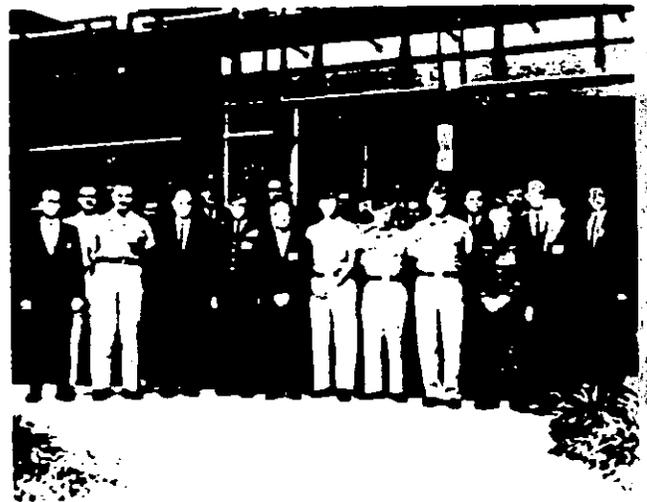
4th PACAF Nuclear Safety Officers Course. L. to r. (first row): SSgt N. R. Skeeters; MSgt F. E. Winters; SSgt J. E. Walls; SSgt C. R. Hadley; Lt J. R. McGowan. (Second row): SSgt S. Pratt; SSgt R. E. Rogers; SSgt T. E. Jessop; Lt R. E. Walden; Lt S. P. Kirchenbaum; Capt H. K. Nemato. (Third row): Lt R. G. Stephenson; Capt G. Arthur; Maj J. J. O'Connor; Maj R. B. McCann; Capt R. J. Eisenrich; TSgt W. E. Porter.

AUTONETICS COURSE

The Autonetics Division of North American Aviation Corporation conducted an LGM-30F Computer Course for members of the Nuclear Weapon System Safety Group (NWSSG) and its technical advisors the week of 18 April 1966. The course was conducted at the Anaheim North American plant in California.

The course was designed to provide NWSSG members and project engineers with information on programming the Minuteman computer. In the LGM-30F system, the airborne computer is used to process weapon system status and command and control signals—key considerations in Nuclear Safety analyses conducted by the NWSSG.

In addition to the Air Force commands concerned the course was attended by representatives from Field Command/Defense Atomic Support Agency, the Atomic Energy Commission, and Sandia Corporation.



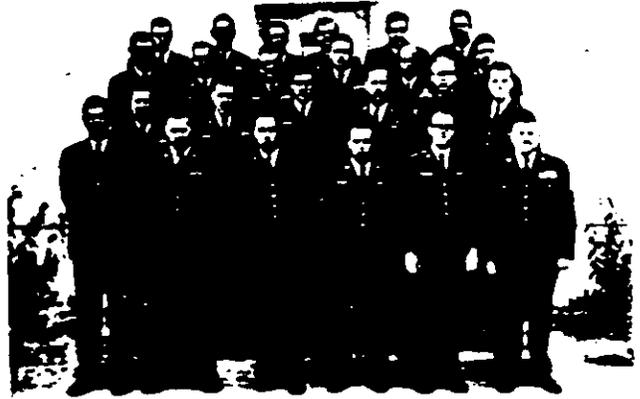
NWSSG MEMBERS AND TECHNICAL ADVISORS ATTEND AUTONETICS COURSE. L. to r.: Donald Southwell; 1st Lt George W. Taylor; Capt David E. Griffin; Maj Kenneth R. Bonnett; Erwin G. Klink; Lt Col Randall S. Kane; Lt Col John W. Waller; Robert L. Hilty; Paul R. Smith; Maj William L. Kincaid; Capt Wilbur D. Dice; Maj Gerald E. Weinstein; Lt Col Harlan P. Ross III; Lt Col Harvey A. Cook, Jr; Maj Louis A. Pendergrass; Maj Wendell E. Cosner; Maj James V. Ruzic; Capt Raymond E. Siferd; Lt Col Howard L. Harris, Jr; Richard B. Craner; Thomas D. Clark; Valdean Watson.

TRAINING NEWS

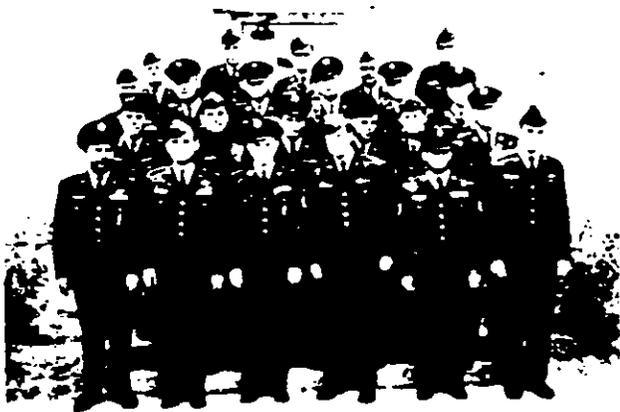
SAC NUCLEAR SAFETY CLASSES



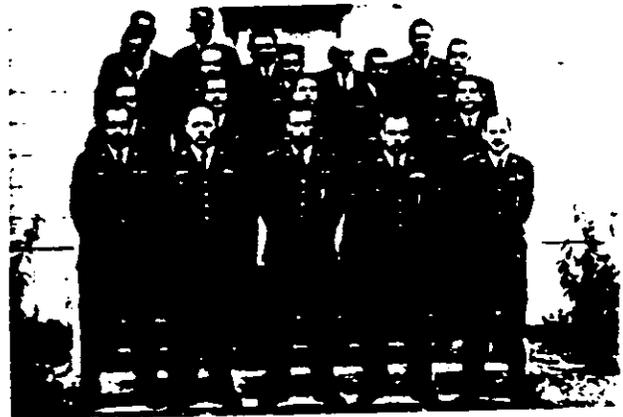
SAC Class 66-J, Nuclear Safety Operations Course, 130002. L. to r. (first row): MSgt G. W. Skidmore; CMSgt E. L. Ryles; MSgt R. A. Renn; Capt T. H. Jones; SSgt D. W. Statton; 1st Lt J. W. Lundy; MSgt J. J. Isler. (Second row) MSgt J. C. Wiggs; CWO-3 A. L. Sales; TSgt H. Thompson; 1st Lt F. Sauer; 1st Lt R. J. Whitney, Jr; CMSgt G. Fisher. (Third row): B. L. Merrill; MSgt W. F. Dermody; Maj R. C. Richards; SSgt J. L. Grise; Capt G. O. Poston. (Fourth row): SSgt P. W. Holmes; 1st Lt B. T. Washington; MSgt W. J. Weaver; TSgt W. E. Gustman.



SAC Class 66-L, Nuclear Safety Operations Course, 130002. L. to r. (first row) 2d Lt J. K. McMahon; TSgt D. W. Foster; 1st Lt F. R. White; TSgt L. G. Wigle; 1st Lt A. L. Livingston; MSgt H. A. Rickard. (Second row): Lt Col C. R. Van Horn; CMSgt E. W. Bush; 2d Lt J. A. Lopez; MSgt F. A. Hulsey; 1st Lt R. A. Webster; 2d Lt R. D. Clark. (Third row) 2d Lt J. D. Isom; CMSgt R. D. Green; CMSgt C. C. Schoolfield; TSgt J. E. Loar; Lt Col B. E. Purdom; SMSgt P. A. Maxwell. (Fourth row): 1st Lt R. F. Hudson; SMSgt J. L. Langford; TSgt B. S. Milene; TSgt H. L. Brown; TSgt D. L. Bowden; MSgt D. O. Nelson.



SAC Class 66-K, Nuclear Safety Operations Course, 130002. L. to r. (first row): Maj J. H. Taylor; Maj R. S. Armstrong; SMSgt J. M. Phillips; 1st Lt A. J. Minker; TSgt M. S. Rahman; 2d Lt R. A. Morris. (Second row): 1st Lt O. G. King; 1st Lt L. S. Wetter; TSgt M. G. Hillman; SMSgt T. J. Owens; 2d Lt L. W. Peterson; TSgt D. E. McNeese. (Third row): CWO-4 M. L. Goates; TSgt J. C. Hill Sr; TSgt V. W. Swan; SMSgt C. L. Huffman; TSgt H. T. Hartman; SSgt G. W. Daucet. (Fourth row): Maj J. R. Thomas; 2d Lt H. W. Byars; 2d Lt E. M. Wright; CWO-4 R. W. Myers; 2d Lt K. L. Gerken.



SAC Class 66-M, Nuclear Safety Operations Course, 130002. L. to r. (first row): SSgt G. D. Couch; SSgt H. Humphry; Capt L. O. Dewhurst; MSgt R. P. Morris; MSgt H. J. Sabeczak. (Second row): MSgt H. R. Sunde; 1st Lt M. T. McAndrews; 2d Lt K. Fortino; Capt E. W. Clark; Maj P. P. Carrell. (Third row): 1st Lt G. B. Hays; SSgt E. A. Townsend; TSgt P. T. Moreno; Capt K. A. Carlson; Maj V. H. Arrell. (Fourth row): D. A. Cassina (Civ); 1st Lt T. H. Ethridge; Capt A. Paerels, Jr; W. C. Stewart (Civ); TSgt D. L. Larson.

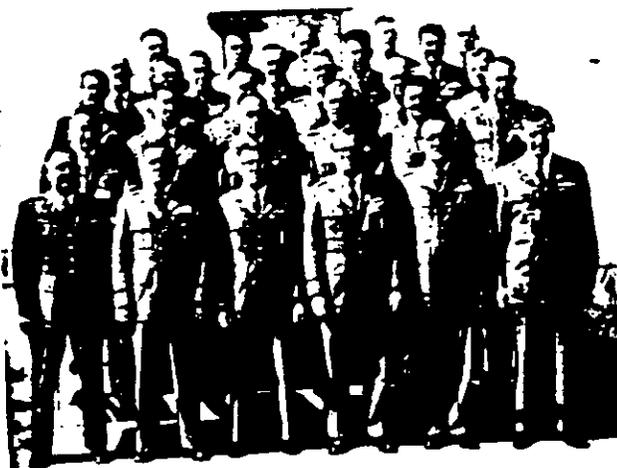
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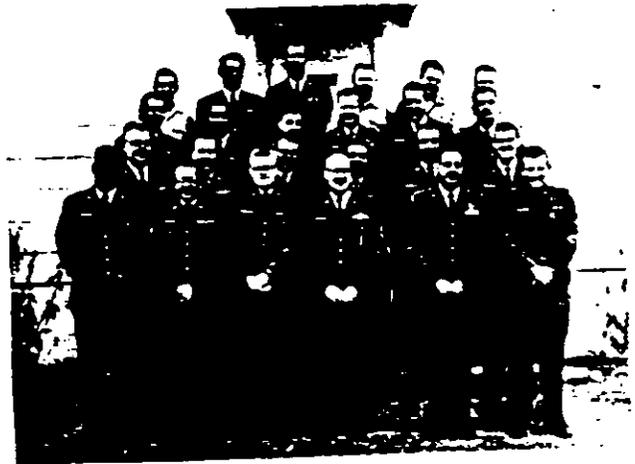
SAC Class 66-N, Nuclear Safety Operations Course (Basic), 130002
 L. to r. (first row) Maj J. W. Jackson; TSgt D. A. Gregg; 1st Lt L. L. Shultz; 2d Lt M. R. Burchfiel; TSgt C. A. Clark; SSgt G. G. Barnett; (Second row) 1st Lt F. H. Raymond; CMSgt J. L. Shaw; SSgt V. L. Neal; 1st Lt T. S. Finn; 1st Lt R. L. Swett; SMSgt G. L. Murray; (Third row) MSgt P. A. Stockard; 1st Lt D. L. Hutton; Capt T. A. Barnbridge; MSgt P. G. Cermak; 1st Lt R. Brown (Civ); TSgt C. J. Thibodeaux; (Fourth row) 2d Lt J. A. Mercer; 2d Lt W. A. Schunk; 1st Lt M. L. Oliver; 1st Lt D. R. Jones; SSgt H. J. Kammerer



SAC Class 66-P, Nuclear Safety Operations Course (Basic), 130002
 L. to r. (first row) TSgt R. L. Maul; TSgt S. H. Brightful; TSgt E. B. Hunter; 2d Lt W. C. Stellbrink; 1st Lt D. G. Evans; Capt M. E. Speed; (Second row) 1st Lt S. J. Pawelek; Capt W. W. Jones; 1st Lt H. G. Schater; Maj L. H. Maddox; 1st Lt R. L. Hart; CWO (W-4) K. R. Teasley; (Third row) SSgt R. C. Weethee; Maj P. T. Foret; SSgt W. H. Gravely; 1st Lt R. H. Russell, II; 1st Lt C. D. Loughridge; MSgt F. J. Allein; (Fourth row); SSgt E. G. Scheerer; 1st Lt R. M. Koles



SAC Class 66-D, Nuclear Safety Operations Course (Advanced), 130008
 L. to r. (first row) Maj N. J. Mastara; Lt Col N. C. Rogers; Capt J. R. Cole; Capt D. L. Gray; Maj R. B. Paul; Maj W. C. Howell; (Second row) Maj E. Harst; Maj K. H. Hallmark; Maj O. A. Sleep; Lt Col R. E. Starkey; Maj J. D. Brown; (Third row) 1st Lt F. H. Raymond; Maj E. E. Miller; Maj P. H. Hewitt; Maj C. E. Tarkelson; Maj J. C. Frye Jr; Lt Col G. W. Case; (Fourth row) Maj E. W. Kells; CWO-4 J. C. Courrier, Jr; Maj C. H. Heiser; MSgt C. L. Canipe; Maj H. F. Long; (Fifth row) Maj A. W. Fooks; 2d Lt L. L. Parr; Maj J. H. Spearman; Capt T. S. Crouch; Maj W. E. Burris



SAC Class 66-Q, Nuclear Safety Operations Course (Basic), 130002
 L. to r. (first row) SSgt S. C. Cook, Jr; SSgt J. E. Simms; 1st Lt S. L. Arey, Jr; SMSgt J. H. Grass; Lt Col H. A. Dofler; TSgt R. D. Hill; J. E. Quigley; (Second row) Lt Col H. A. Dofler; TSgt R. D. Hill; 2d Lt F. H. Shafer; 1st Lt R. Groll; SSgt B. L. Neal; 1st Lt J. F. Schang; (Third row) SSgt E. A. Gretchner; 1st Lt W. D. Ross; 1st Lt A. R. L. Schmidt; Maj C. C. Gaskins; 1st Lt P. E. Deuschle; Lt Col R. E. Statham; (Fourth row) SSgt E. R. Fortin; TSgt C. E. Griswold; TSgt B. D. Ramsey; SSgt D. L. Spencer; V. Allen, Jr (Civ); CMSgt A. S. Merriman

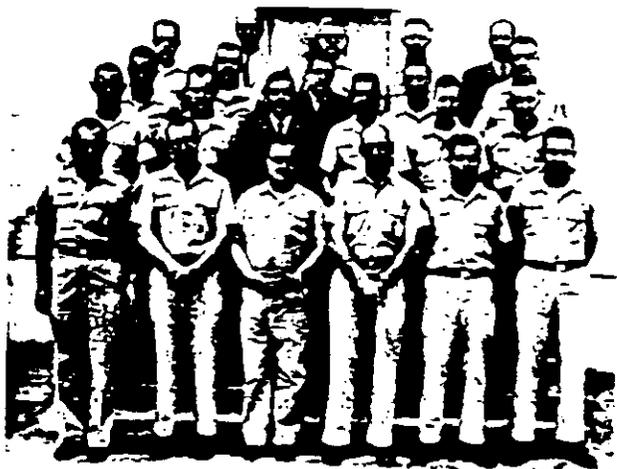
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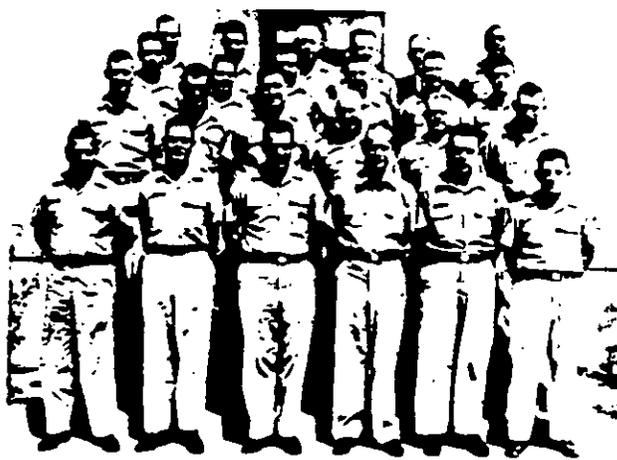
SAC Class 66-R, Nuclear Safety Operations Course (Basic) 130002. L. to r. (first row): MSgt J. A. McCoy; MSgt R. H. Haynes, Sr.; TSgt R. L. Lindsey; Capt J. S. Kochell; Maj R. H. Lewis; 1st Lt R. B. Dow. (Second row): Lt Col J. H. Cannon, Jr.; 1st Lt J. E. Tucker; Maj R. J. Kohnok; Maj J. German; Lt Col L. C. Winham, Jr.; 2d Lt J. L. McMahon. (Third row): SMSgt P. C. Skidgel; TSgt B. E. Reynolds; CWO-3 G. W. Knapp; 1st Lt W. C. Janu; MSgt G. Crotte; J. L. Marr (Civ). (Fourth row): 2d Lt R. A. Roadarmel; TSgt R. W. Beaman; TSgt E. J. Radzvilowicz; SSgt R. J. Nettles; CMSgt L. W. Barnbridge; MSgt J. T. Wilson.



SAC Class 66-T, Nuclear Safety Operations Course (Basic) 130002. L. to r. (first row): SSgt J. M. Powlas; TSgt C. Blair; TSgt V. McClenney; Lt Col W. Dodson; Lt Col B. Findley; 1st Lt O. J. Dickherber. (Second row): SSgt T. E. Lacey; Capt W. C. Booth; TSgt E. Davis; C. D. Whitacre (Civ); TSgt W. Black; AIC C. D. Smith. (Third row): 1st Lt D. A. Oelschlager; 1st Lt W. Jue; 2d Lt W. E. Brophy; TSgt W. R. Lovelace; 2d Lt J. L. Moore, III; 2d Lt K. T. Clifford. (Fourth row): 2d Lt D. W. Long; 2d Lt J. C. Ruckart (Not shown); SSgt A. G. Madrid; MSgt R. H. Cassidy; CMSgt K. A. Hillary.



SAC Class 66-S, Nuclear Safety Operations Course (Basic) 130002. L. to r. (first row): MSgt R. E. Keune; 1st Lt S. E. Strickler; TSgt L. E. Cortor; MSgt C. D. Mercer; 1st Lt A. Anderson; 1st Lt C. A. Swann. (Second row): SSgt R. A. Smith; SSgt T. R. Mackey; 2d Lt W. F. Hanchell; 2d Lt C. O. Liechty; 1st Lt J. H. Bush; MSgt J. T. Nally. (Third row): MSgt D. E. Burch; SSgt R. F. McMahon; 1st Lt M. S. Zickler; Capt G. A. Perkins; SMSgt G. L. Snyder. (Fourth row): TSgt P. C. Vanderslice, Jr.; J. R. Dixon (Civ); 2d Lt R. L. Rishes; SMSgt H. D. Swift; Lt Col J. H. Crowover.



SAC Class 66-U, Nuclear Safety Operations Course (Basic) 130002. L. to r. (first row): SSgt E. Wanser; CWO-4 W. E. Core; MSgt D. W. Murrill; SSgt L. H. Sand; TSgt C. M. Rawson; CMSgt J. Tirpak. (Second row): 1st Lt S. G. Thompson; SSgt R. F. Patterson, Jr.; MSgt R. A. Tygerson; SMSgt W. L. Cox; SSgt J. F. Quirato; TSgt D. E. Atchley. (Third row): TSgt J. A. Lona; SMSgt C. R. Robinson; SSgt A. R. Vigarito; SSgt R. W. Emerson; 2d Lt E. L. Mabry; 2d Lt C. J. Ferriola, Jr. (Fourth row): SMSgt J. W. Brown; SSgt W. G. Taylor; Capt B. L. Henning; SSgt L. W. Jaida; H. F. Cox (Civ); SSgt A. Fowler.