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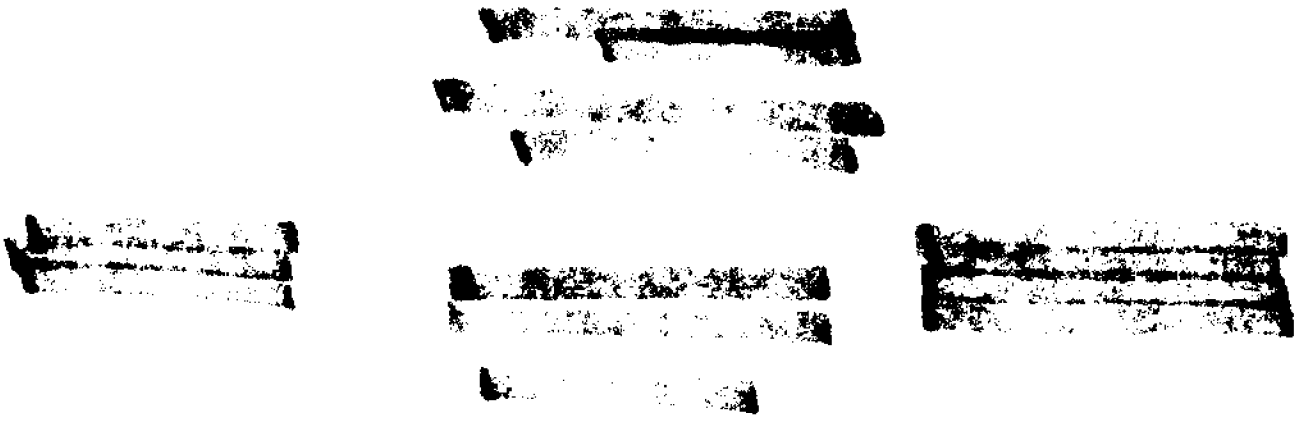

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ADC HISTORICAL STUDY NO. 38

REDACTED

THE AIR NATIONAL GUARD IN AIR DEFENSE

(U)

1946-1971

by RICHARD F. McMULLEN

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CONTENTS

CHAPTER I

THE FALSE START
1946-1950

(U) When the Air National Guard was established after the end of World War II, the War Department anticipated that a considerable portion of the new force would be dedicated to the air defense mission. The first mission given to the new Air Defense Command, in March 1946, said that ADC would "organize and administer the integrated air defense system of the Continental United States;...[and] maintain units of the Air National Guard...in a highly trained and operational condition of readiness;...."[1]

(U) The new command actually assumed official life on 27 March 1946 at Mitchel Field, New York. The first commander was Lt. Gen. George E. Stratemeyer, wartime commander of Army Air Forces, China Theater. General Stratemeyer was almost immediately dubious about the value of the ANG, although he surmised, correctly, that ADC would have to depend almost completely on the ANG since the original allotment of regular combat forces to ADC amounted to two Night Fighter squadrons, one of which was

1. Ltr (U), AAF to ADC, "Interim Mission," (Doc 7 in Hist of ADC, Jan-Jun 1951).

a completely paper organization. The second consisted of one officer and two airmen, but no aircraft. General Stratemeyer found it difficult, he wrote AAF on 16 April 1946, to consider the citizen-soldiers of the ANG as part of the first line of defense, no matter how well organized and trained. It was, of necessity, an augmentation force to supplement the regular forces on some future mobilization day.[2]

(U) Nevertheless, General Stratemeyer resolved to make the best of the situation and had already (15 April 1946) written Maj. Gen. Butler B. Miltonberger, Chief of the National Guard Bureau, of his concept of the ADC/ANG relationship as regards air defense. "The mission of the air national security for the continental United States," he wrote, "has been assigned in large measure to the Air National Guard. By reasons of the important roles assigned to the civilian air components...the Air Defense Command was originated to place under one commander the primary responsibility for the efficiency and effectiveness of the Air National Guard. This responsibility must be accomplished by greater authority in dealing with Air National Guard matters. In general, I feel I must be responsible for organizing and administering the Air National Guard in its federally recognized status."[3]

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2. Ltr (U), ADC to AAF, "Problems Confronting ADC in Dealing With Civilian Air Components," 16 Apr 46 (App IX to Hist of ADC, "Evolution of the Mission," Mar 1946-Jun 1947).

3. Ltr (U), Lt. Gen. George E. Stratemeyer, CG, ADC

(U) Activation of postwar ANG units was begun by the states on 25 April 1946. The plan in effect at that time called for the creation of 72 fighter squadrons, capable of either air defense or the support of ground forces. Each squadron was to be equipped with 25 aircraft. Some were to be supplied with the F-47 Thunderbolt, others with the F-51 Mustang. The federal government was to provide aircraft, instructors, supplies and pay. The states were to furnish bases, people, and storage facilities. Operational control, short of federalization, was to rest with the governors of the several states through their adjutants general. The National Guard Bureau was the intermediary between the states and the U. S. Army. Reestablishment and reequipment of the ANG was scheduled for completion by June 1947.[4]

(U) The position of the AAF was confirmed on 20 May 1946 when General Carl Spaatz, Commanding General, Army Air Forces, told the House Appropriations Committee that air defense forces would come "principally" from the ANG and the Air Force Reserve. He also requested that the ANG

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3. (cont) to Maj. Gen. Butler B. Miltonberger, Chief, NGB, 15 Apr 1946, as cited in Hist of ADC, Mar 1946-Jun 1947, p 6.

4. Hist of ADC, "Evolution of the Mission," March 1946-June 1947, pp 33-40.

be provided with 84 fighter squadrons rather than the 72 specified in earlier plans.[5]

(U) The states did not prove amenable to the type of direct ANG control General Stratemeyer had in mind and on 10 May 1946 AAF found it necessary to inform ADC that existing federal statutes (which had been cited by state authorities) made it necessary for ADC to limit its control over the ANG. While ADC was encouraged to maintain close liaison with the National Guard Bureau and conduct discussions with the states, no agreements resulting from such contacts were to be binding prior to approval by AAF. Furthermore, as regards the selection of bases for ANG units, ADC was to act only in an advisory capacity. On 5 June 1946 the "interim" mission of ADC was revised to direct a more cautious approach to the ANG. The new directive read that ADC would merely discharge the responsibilities of the AAF with respect to the organization, training and maintenance of the ANG, subject to policies laid down by AAF.[6] In short, ADC responsibility for the ANG covered only training.

(U) As a result, General Stratemeyer, who had not been

5. House Hearings on the Military Establishment Appropriation Bill for FY 1947, 20 May 1946, pp 407, 408, and 414.

6. Ltr (U), AAF to ADC, "Special Directive on Methods and Procedures," 10 May 1946 (App VIII to Hist of ADC, "Evolution of the Mission," Mar 1946-Jun 1947); Ltr (U) AAF to ADC, "Interim Mission," 5 Jun 1946 (App II to Hist of ADC, Mar 1946-Jun 1947).

convinced of the efficacy of the ANG as a usable air defense weapon from the beginning, but had attempted to make the best of the situation, grew increasingly disillusioned with his state-oriented auxiliary. On 25 September 1946 he felt impelled to write General Spaatz:[7]

> Our present national security, and particularly our security five to ten years hence, depends to a large extent on States accepting the responsibility for creating Air National Guard units which can immediately be called into Federal service for effective use on the outbreak or threat of hostilities. If, as happens to be the case at present, they are not disposed to accept this responsibility, I believe the War Department should recommend another system for providing national defense in the air.

(U) Progress toward the goal of 84 squadrons, as indicated by General Stratemeyer, was painfully slow. To achieve federal recognition an ANG unit had to show a strength of at least 25 percent of the required officers and 10 percent of the required enlisted men. By the early spring of 1947 only 30 ANG fighter squadrons within the United States had achieved this status. These were:[8]

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7. Ltr (U), Stratemeyer to Spaatz, 25 Sep 46, as quoted in Hist of ADC, "Evolution of the Mission," March 1946-June 1947, pp 46-47.

8. Ltr (U), AAF to ADC, "Interim Ceiling on National Guard Organization," 14 Mar 47 (App X to Hist of ADC, "Evolution of the Mission," Mar 1946-Jun 1947).

Squadron	Location
101	Boston, Massachusetts
104	Baltimore, Maryland
109	St. Paul, Minnesota
110	St. Louis, Missouri
118	Windsor Locks, Connecticut
120	Denver, Colorado
121	Washington, D. C.
123	Portland, Oregon
124	Des Moines, Iowa
127	Wichita, Kansas
128	Marietta, Georgia
132	Bangor, Maine
134	Burlington, Vermont
142	Wilmington, Delaware
153	Meridian, Mississippi
154	Little Rock, Arkansas
155	Memphis, Tennessee
157	Columbia, South Carolina
158	Savannah, Georgia
159	Jacksonville, Florida
173	Lincoln, Nebraska
174	Sioux City, Iowa
175	Sioux Falls, South Dakota
178	Fargo, North Dakota
187	Cheyenne, Wyoming
190	Boise, Idaho
191	Salt Lake City, Utah
195	Los Angeles, California
196	San Bernardino, California
197	Phoenix, Arizona

(U) It was perhaps just as well that federal recognition came slowly, because it became apparent in February 1947 that the planned number of ANG fighter squadrons could not be financed from funds available during FY 1947. In addition to the 30 squadrons already in receipt of federal recognition, only seven more could be brought to that status in that year. These were the 111th at Houston, Texas; the 113th at Indianapolis, Indiana; the 125th at

Tulsa, Oklahoma; the 148th at Reading, Pennsylvania; the 162nd at Columbus, Ohio; the 165th at Louisville, Kentucky and the 119th at Newark, New Jersey.[9]

(U) This policy was relaxed somewhat in May 1947 when the number of ANG fighter squadrons which could be given federal recognition was increased by 13, bringing the approved total of fighter squadrons to 50 by the end of the fiscal year. These fell into three categories: (1) units inspected and recommended for federal recognition; (2) those which had requested inspection, and (3) those which had requested permission to organize, but had not yet requested inspection. In the first category were: 105th (Nashville, Tennessee), 113th (Indianapolis, Indiana), 131st (Springfield, Massachusetts), 133rd (Manchester, New Hampshire), 167th (Charleston, West Virginia), 181st (San Antonio, Texas), and 185th (Oklahoma City, Oklahoma). Four squadrons fell into the second category: 126th (Milwaukee, Wisconsin), 149th (Richmond, Virginia), 169th (Peoria, Illinois), and 186th (Butte, Montana). Finally, the third category included the 176th (Madison, Wisconsin) and the 188th (Albuquerque, New Mexico).[10]

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9. Ibid.

10. Ltr (U), AAF to ADC, "Policies Governing Organization of the Air National Guard," 26 May 47 (App XI to Hist of ADC, "Evolution of the Mission," Mar 1946-Jun 1947).

(U) For a while, in this period, primary attention was diverted to the AAF struggle for independence, an effort which culminated in the passage of the National Security Act on 16 July 1947. The United States Air Force (USAF) was created on 18 September 1947. In December 1947 the new USAF provided ADC with a mission statement to replace the "interim" statement of March 1946, as revised in June 1946. In recognition of the patently unready state of the ANG, this statement directed that ADC plan use of the ANG whenever it was ready. It was still intended that the ANG constitute the major element of the manned interceptor force, since USAF alone let it be known that if Congress authorized a regular Air Force of 70 groups only 12 squadrons of interceptors would be allocated to ADC. In a 55-group Air Force only nine such squadrons would be so allocated. At the end of 1947 ADC controlled seven squadrons of regular Air Force interceptors.[11]

(U) The ANG fighter force contained, theoretically, 50 squadrons, but it added no in-being strength to the Air Defense Command in 1948. The lines of communication were hopelessly snarled. Some squadrons were the darlings of state governors who were not disposed to accept any sort of direction from ADC. There was no coordination between the

11. Ltr (U), USAF to ADC, "Air Defense," 17 Dec 1947 (Doc 17 in Hist of ADC, Jan-Jun 1951); ADC Hist Study No. 22, "Air Defense and National Policy," 1946-1950, p 38.

training programs of the 48 states. Every ANG squadron with an air defense mission suffered from individual inefficiency and a gross lack of readiness for combat operations. Also, as World War II faded further into the background the number of qualified fighter pilots declined. Above all, there was little disposition on the part of Congress to provide the National Guard Bureau with the funds that might have helped relieve the situation. It became increasingly obvious that the ANG was not a usable weapon. Near the end of 1948 Secretary of Defense James Forrestal put the matter bluntly to President Harry Truman: "The situation is...complicated by the impracticability of attempting to organize, operate and train effective [ANG] combat forces when the components are under the control of forty-eight 'commanders-in-chief'."[12]

(U) Unfortunately, 1948 was also the year that East-West tension began to increase. On 24 February a Communist coup in Czechoslovakia added that country to the Soviet buffer zone of satellites in Eastern Europe. On 5 March General Lucius Clay, U.S. Commander in Berlin, noted increasing difficulty in dealing with his Russian counterparts. On 8 March, observers on the scene predicted that

12. Memo (U), Secretary of Defense Forrestal for President Truman, 7 Dec 1948 (HO files).

Chiang Kai-shek would lose China to the Communists. On 12 March the British, sensing a change in the international climate, expressed the need to discuss Atlantic security with the United States. All this brought about increased anxiety over the safety of the Atomic Energy Commission plant at Hanford, Washington. General Carl Spaatz, USAF Chief of Staff, therefore ordered ADC, on 27 March 1948, to establish an active air defense system in the Pacific Northwest. The results were not encouraging, since the SAC F-51 aircraft deployed to the area were not manned by crews with experience in ground-controlled interception and the ground radar technicians were mostly inexperienced trainees.

(U) In spite of the patent failure in the northwest, ADC was directed, on 23 April 1948, to extend makeshift air defenses to the northeastern United States and the Albuquerque area. The total result was not impressive.

(U) Therefore, since the ANG was not likely to offer much, if any, assistance and the regular air defense establishment, as it stood, was not large enough or ready enough to assume the responsibility, a reorganization of the regular Air Force was ordered. On 1 December 1948 the Continental Air Command (ConAC) was formed. This new command included ADC and the Tactical Air Command, plus nine fighter squadrons formerly assigned to SAC. The rationale behind this

action was that all fighter units should be trained for both tactical and air defense action, thereby greatly increasing the number of aircraft available for both missions. ConAC also had supervision, insofar as Air Force influence could be applied, over the training of the ANG.[13]

(U) Neither did the situation as regards the ANG improve in 1949 for the simple reason that the ANG was not amenable to ConAC control or even suggestion. Since Congressional action was required to federalize any portion of the ANG, it was unlikely that any ANG fighter squadron would be available in less than two weeks from the beginning of an emergency. And then there was no assurance that the ANG unit would be ready for immediate air defense use. This situation prompted Lt. Gen. Ennis C. Whitehead, who assumed command of ConAC from General Stratemeyer in April of 1949, to note, on 12 November 1949, that "at best the ANG represents aircraft in flyable storage."[14]

(U) The continuing failure to create a credible air defense force of that portion of the ANG assigned that mission was not for want of trying, however. In October 1949,

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13. Warner R. Schilling, Paul Y. Hammond and Glenn H. Snyder, Strategy, Politics and Defense Budgets (New York, 1962), pp 40-41; Executive Order 10,007, 15 Oct 1948; ConAC GO No. 3, 1 Dec 1948.

14. Memo (U), Whitehead to Maj. Gen. Charles T. Myers, VC, ConAC, no subj, 12 Nov 49 (Attachment to ConAC Air National Guard Study, 15 Jan 1950--DOC 1).

for example, Maj. Gen. Robert M. Webster, commander of ConAC's recently established Eastern Air Defense Force (EADF) proposed to the Adjutant General of New York that those New York ANG squadrons with an air defense mission be given training to familiarize them with the then-building air defense system and that such squadrons be placed under the operational control of EADF. "This control," General Webster contended, "will not usurp the ANG commander's command prerogatives nor violate Federal and/or State constitutional rights. It is solely to permit smooth transition from peacetime air defense training within an air defense sytem to actual employment against an enemy at a moment's notice. Obviously, if the agency for air defense did not possess the above, D-Day would find us with another Pearl Harbor of far greater consequences."[15]

(U) After reaching an agreement with New York, General Webster hoped to come to similar agreements with other states in the northeastern United States. This effort came to naught, however, when Maj. Gen. Karl F. Hausauer, Chief of Staff to the Governor of New York, characterized the proposal as impractical. "The laws of the State of New York," General Hausauer replied, "do not empower the

15. Ltr (U), EADF to Adjutant General, State of New York, "Utilization of ANG Units in Air Defense," 7 Oct 49 (Doc 4 to Hist of EADF, Sep-Dec 1949).

Governor to employ the National Guard for operations of the character contemplated except under conditions where attack is imminent."[16]

(U) Even before the negative reaction from New York, however, ConAC and USAF had decided that the battle for more control of the ANG was a losing one and that the ANG should be considered an M-Day force (available after the beginning of general war mobilization) rather than a D-Day force (available immediately) and that it should be given a tactical support mission rather than an air defense mission. It was concluded that to regard the ANG as an air defense force established a position of false strength. These conclusions were reached during a meeting at USAF on 5 January 1950.[17]

(U) This did not come to pass, however, and in June of 1950 ConAC directed the Defense Forces (Western Air Defense Force--WADF--in addition to EADF) to establish training programs that would provide for ANG training within the air defense system whenever local commanders would permit it. Very little such training was accomplished, however, except during ANG summer encampments. During the summer of 1950 several ANG squadrons worked closely with ConAC,

16. Ltr (U), Maj. Gen. Karl F. Hausauer, C/S to the Governor (NY), to Webster, no subj, 9 Jan 50 (Doc 6 in ADC Hist Study No. 5).

17. Statement (U), "Results of Meeting in General Fairchild's Office on 5 January 1950," (Attachment to ConAC Air National Guard Study, 15 Jan 1950--DOC 1).

although two weeks was hardly sufficient time to train proficient interceptor aircrews.[8]

(U) The relationship between the Air Force and the ANG changed dramatically following the North Korean invasion of South Korea on 25 June 1950. Earlier in 1950 Congress proposed to replace the Selective Service Act of 1948 (which expired on 9 July 1950) with legislation which continued the proviso that reserve units (including the ANG) could not be called into Federal service without Congressional approval. There were a number of disagreements over the wording of this legislation and by the weekend of 25 June it had not been passed. When Congress resumed deliberations on Monday, it was hurriedly decided not to attempt the passage of a new selective service bill, but merely to extend the coverage of the 1948 law for one year. It also added, as Section 21 of the new Selective Service Act of 1948, a proviso that the President be allowed, without Congressional approval, to call to active Federal service for 21 months, any member or unit of any of the reserve forces. This amendment was passed by Congress on 30 June 1950.[19]

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18. Ltr (U), ConAC to Defense Forces, "Employment of Air National Guard Aircraft in Air Defense Mission," 9 Jun 50 (Doc 10 in ADC Hist Study No. 5); Hist of EADF, 1950, pp 195-206; Hist of 10 AF, Jul-Dec 1950, p 279.

19. Public Law 599, 81st Congress, 30 June 1950; Congressional Record, 81st Congress, 2nd Session, 27 Jun 1950, pp 9289-90.

(U) ConAC immediately began to make plans for use of the war powers conferred on the Chief Executive, since they offered an opportunity to draw closer to the pool of fighter aircraft controlled by the ANG. Barely two weeks after the enactment of this legislation, Brig. Gen. Herbert B. Thatcher, ConAC Deputy for Operations, proposed that 20 ANG fighter squadrons be federalized to strengthen ConAC's air defense posture.[20]

(U) This proposal was not approved by USAF on the grounds that it was ready to increase the number of regular Air Force allocated to air defense and that it preferred to have regular units, rather than federalized ANG squadrons, assigned to this mission. ConAC then took a somewhat different tack. On 27 September 1950, ConAC asked that its Defense Forces be given the authority to federalize ANG squadrons in the event of imminent or actual enemy attack. This request was also refused, USAF explaining that the Secretary of the Air Force desired to retain the federalization power in his own hands.[21]

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20. Ltr (U), Brig. Gen. Herbert B. Thatcher, D/O, ConAC to USAF, "Air Defense Augmentation," 15 Jul 50 (Doc 91 in Hist of ADC, Jan-Jun 1951).

21. Ltr (U), ConAC to USAF, "Use of ANG Fighter Units in Air Defense," 27 Sep 50 (Doc 15 in ADC Hist Study No. 5); Ltr (U), USAF to ConAC, "Emergency Employment of ANG Fighter Squadrons," 2 Nov 50 (Doc 14 in ADC Hist Study No. 5).

(U) Whatever form the expansion of the air defense force took--creation of additional squadrons of the regular Air Force or federalization of the ANG--it was decided in October 1950 that an independent Air Defense Command should be re-established to administer and control it. The new ADC began operations at Colorado Springs in early January 1951. Meanwhile, in early November 1950, a new dimension was added to the Korean War when Chinese Communist troops crossed the Yalu River into Korea. On 6 December 1950, because of what appeared to be a deepening threat to the security of the United States, General Whitehead repeated his request for federalization of the ANG.[22]

(U) Whitehead requested federalization of 38 ANG squadrons, 12 less than the 50 planned for possible air defense use at the end of Fiscal Year 1947. Since the end of FY 1947 the face of the ANG air defense force had been altered considerably. Units planned for air defense use had been given other responsibilities or had been disbanded. Others, not considered in 1947, had been added to the air defense roster. At any rate, assured of USAF approval, General Whitehead listed 15 ANG squadrons he thought should be

22. Ltr (U), ConAC to USAF, "Use of ANG Units in the Air Defense of the United States," 6 Dec 50 (Doc 92 in Hist of ADC, Jan-Jun 1951).

federalized first, because they were located in areas where radar coverage was available and were based where adequate support facilities were located. At that time (December 1950), the 38 ANG squadrons listed were assigned an average of 16 aircraft. Four of the 15 priority squadrons had jet fighters (F-80 and F-84), as did six of the 23 squadrons he proposed to hold in reserve. The others were equipped with F-47 and F-51 aircraft left over from World War II.[23]

(U) Before the end of 1950, however, Whitehead apparently had come to the conclusion that the international situation had worsened. On 29 December 1950, in one of his last official air defense acts before the new activation of the new ADC, he requested that the other 23 ANG squadrons assigned an air defense mission be federalized as soon as possible, regardless of their lack of facilities.[24]

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23. Ibid.; Memo for the Record, ConAC, "Planning Committee Meeting," 7 Dec 50 (Doc 16 in ADC Hist Study No. 5).

24. Msg (U), ConAC to USAF, 29 Dec 50 (Doc 17 in ADC Hist Study No. 5).

CHAPTER II

FEDERALIZATION OF THE AIR NATIONAL GUARD 1951-1952

(U) The final ConAC request for federalization of the remaining 23 ANG squadrons was only partially approved. After reactivation of Air Defense Command, USAF furnished, on 22 January 1951, instructions for the federalization of the first 15 ANG squadrons on 10 February, with six more to be brought to federal service on 2 March. Those federalized in February 1951 were the following:[1]

Squadron	Base	Aircraft
113	Stout Field, Indiana	F-51
116	Geiger Field, Washington	F-84
118	Bradley Field, Connecticut	F-47
121	Andrews AFB, Maryland	F-84
123	Portland, Oregon	F-51
132	Dow AFB, Maine	F-80
133	Grenier AFB, New Hampshire	F-51/F-47
134	Burlington, Vermont	F-47
142	New Castle County, Delaware	F-84
148	Reading, Pennsylvania	F-51/F-47
163	Baer Field, Indiana	F-51
166	Lockbourne AFB, Ohio	F-84
172	Kellogg Field, Michigan	F-51
176	Truax Field, Wisconsin	F-51
188	Kirtland AFB, New Mexico	F-51

1. Ltr, USAF to ADC, "Use of ANG Units for Air Defense," 22 Jan 51 (Doc 64 in Hist of ADC, Jan-Jun 1951); Hist of ADC, Jan-Jun 1951, pp 127-133.

Added in March were:

Squadron	Base	Aircraft
105	Berry Field, Tennessee	F-47
109	Holman Field, Minnesota	F-51
126	Mitchell Field, Wisconsin	F-80
136	Niagara Falls, New York	F-47
175	Sioux Falls, South Dakota	F-51
179	Duluth, Minnesota	F-51

(U) Sixteen other ANG squadrons were held in reserve status and not federalized. One other squadron included in the earlier number of 38 was transferred to Air Training Command. The 16 reserve ANG squadrons were located as follows:

Squadron	Base
101	Logan Field, Massachusetts
104	Harbor Field, Maryland
119	Newark, New Jersey
131	Barnes Field, Massachusetts
137	Westchester County, New York
138	Hancock Field, New York
139	Schenectady, New York
146	Greater Pittsburgh, Pennsylvania
147	Greater Pittsburgh, Pennsylvania
152	Providence, Rhode Island
162	Dayton, Ohio
164	Mansfield, Ohio
169	Peoria, Illinois
181	Hensley Field, Texas
194	Hayward, California
195	Los Angeles, California

(U) Although the federalization of 21 ANG squadrons in early 1951 doubled the size of the air defense interceptor force--from 21 to 42 squadrons--within a month, this increase was not pure gain. What was added was a large measure of air defense potential. Because of the arms-length

stance of the regular Air Force and the ANG over the years preceding federalization, the ANG units had not received adequate training in air defense procedures. Many of the newly acquired squadrons were badly positioned for defense against an attack by manned bombers. Finally, Congress and the national military establishment had not been overly generous in the provision of equipment for the ANG. Most of the federalized force was equipped with surplus fighter aircraft from World War II.

(U) It was necessary to put each of the federalized ANG squadrons through an intensive 120-day period of training and organization prior to the assumption of full partnership in the air defense mission.[2]

(U) To improve the positioning of the new addition to the air defense force, and in many cases, to improve support facilities, 9 of the 21 federalized ANG squadrons had been directed to change location before the middle of 1951. The changes were as follows:[3]

Squadron	From	To
105 FIS	Berry Field, Tennessee	McGhee-Tyson Field, Tennessee
109 FIS	Holman Field, Minnesota	Wold-Chamberlain Field, Minn.
113 FIS	Stout Field, Indiana	Scott AFB, Illinois
118 FIS	Bradley Field, Conn.	Suffolk County AFB, New York
126 FIS	Mitchell Field, Wis.	Truax Field, Wisconsin
148 FIS	Reading, Pennsylvania	Dover AFB, Delaware

2. Hist of ADC, Jan-Jun 1951, p 133.
3. Hist of CADF, Jan-Jun 1951, p 59; Hist of WADF, Jan-Jun 1951, p 8; Hist of EADF, Jan-Jun 1951, pp 7-18.

Squadron	From	To
172 FIS	Kellogg Field, Michigan	Selfridge AFB, Michigan
175 FIS	Sioux Falls, S. Dak.	Ellsworth AFB, S. Dak.
188 FIS	Kirtland AFB, New Mex.	Long Beach, California

(U) In August 1951 the 116th FIS was moved from Geiger Field (Spokane) to England and in March 1952 the 163rd FIS was moved from Baer Field, Indiana, to Sioux City Airport, Iowa. Also, during Fiscal Year 1952, six of the federalized ANG squadrons received improved aircraft. During the last half of 1951 the 121st FIS (Andrews), 142nd FIS (New Castle) and 148th FIS (Dover) traded their F-84A day fighters for F-94A all-weather interceptors. During the succeeding six months the 123rd FIS (Portland) received advanced F-86A day fighters in place of World War II F-51 Mustangs; the 126th FIS (Truax) gave up its F-80 jets--the initial jet fighter--for F-86A aircraft and the 176th FIS (also at Truax) substituted F-89B interceptors for F-51s.[4]

(U) In accordance with federal law, 14 of the ANG squadrons federalized in February 1951 were released from federal service on 1 November 1952; the fifteenth squadron (116th FIS) was overseas and was released by USAFE. The six federalized in March 1951 were released on 1 December 1952. All that was returned to the states, however, was the squadron designation. The aircraft and whatever former ANG

4. Hist of ADC, Jul-Dec 1951, table following p 49; Hist of ADC, Jan-Jun 1952, Chart No. 22.

personnel preferred to remain in federal service were retained by ADC. In effect, then, all that happened in November and December 1952 was a change in designation of 20 fighter squadrons. Three, however, were also re-sited to better locations. The changes are given in Table 1.

CHAPTER III

CREATION OF THE ALERT FORCE 1952-1956

(U) The 16 ANG/ADC fighter squadrons not federalized in 1951 were not brought into the regular force because ADC reached the conclusion that the addition of more propeller-driven aircraft (F-47/F-51) to the active force would not appreciably improve the value of the total air defense force while adding to the support burden. ADC planned, however, in early 1952, to use these 16 squadrons as the nucleus for an expanded ANG air defense force of 52 squadrons to be created after the 21 squadrons currently in federal service were released near the end of 1952. In addition to the unfederalized 16 squadrons and the 21 squadrons currently on active duty (a total of 37 squadrons), it was planned to add the following units:

Squadron	Location
110	St. Louis, Missouri
111	Houston, Texas
125	Tulsa, Oklahoma
149	Richmond, Virginia
153	Meridian, Mississippi
158	Savannah, Georgia
159	Jacksonville, Florida
165	Louisville, Kentucky
170	Springfield, Ohio
196	San Bernardino, California

Additional, but as yet undesignated ANG squadrons were planned for Fort Bragg, North Carolina; Sumter, South Carolina; Tampa, Florida; Chicago, Illinois; and Seattle, Washington.[1]

(U) While the Air Staff gave preliminary approval to the ADC proposal, certain questions were raised. It was unlikely, for example, that runways could be extended sufficiently to permit the ANG to operate jet fighters at such locations as Schenectady, New York; Providence, Rhode Island; Peoria, Illinois; Baltimore, Maryland; Hayward, California; and Mansfield, Ohio. ADC was also asked, in March 1952, to prepare "fall back" positions to consider the commitment of 47, 33, or 18 ANG squadrons to air defense. It was also necessary to consider a situation in which ANG fighter squadrons would be used initially in the air defense role, but would later assume a fighter-bomber responsibility. This would require, of course, that ANG units receive training in both air defense and fighter-bomber techniques.[2]

(U) A new concept with regard to the use of ANG units not on active federal duty surfaced in May of 1952 when Maj. Gen. George G. Finch, Deputy for ANG Affairs, ConAC,

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1. Ltr, ADC to USAF, "Air National Guard Fighter Squadron Program," 9 Feb 52 (Doc 93 in Hist of ADC, Jan-Jun 1952).

2. 1st Ind (Ltr, ADC to USAF, "Air National Guard Fighter Squadron Program," 9 Feb 52), USAF to ADC, 3 Mar 52 and 2d Ind, ADC to USAF, 21 Mar 52 (Doc 93 in Hist of ADC, Jan-Jun 1952).

suggested that more use might be made of ANG units assigned an air defense mission if a "small number of pilot officers at each strategically placed ANG unit [were placed] on active duty with the unit for the purpose of performing... intercept missions."[3] This suggestion was passed along to ADC and was favorably received. After study within ADC and further consultation with ConAC, this proposal was passed along, with ADC blessing, to USAF on 1 August 1952. The USAF Judge Advocate, however, came to the conclusion, in October 1952, that existing law did not permit ANG aircraft to stand an air defense alert unless the ANG unit had been federalized.[4]

(U) Nevertheless, ADC persisted, suggesting that a small number of ANG pilots be put on active federal duty with otherwise state-controlled ANG squadrons to permit immediate response to an air defense emergency. In December 1952 USAF authorized ADC to put 10 ANG pilots on active duty in order to test the ANG alert concept at two locations. Before the end of 1952 ADC had decided that the test would be conducted by the 138th FIS at Hancock Field, New York,

3. Memo, Maj. Gen. George G. Finch, Deputy for ANG Affairs, ConAC for Maj. Gen. Leon W. Johnson, Cmdr, ConAC, "ANG," 20 May 52 (Doc 96 in Hist of ADC, Jan-Jun 1952).

4. Ltr, ADC to USAF, "Use of Inactive ANG Units for Air Defense," 1 Aug 52, 1st Ind, USAF to ADC, 8 Oct 52 and 2d Ind, ADC to USAF, 20 Oct 52 (Doc 102 in Hist of ADC, Jan-Jun 1952).

and the 194th FIS at Hayward, California. Neither squadron had seen active duty in 1951-52.[5]

(U) Because of the retention of ANG aircraft by ADC at the end of ANG federal service in late 1952, the ANG fighter force was almost negligible in 1953. It was necessary to spread the aircraft of the 16 unfederalized squadrons among the 21 returned to the states. Also, it was necessary to provide aircraft for the 15 additional ANG squadrons with a mobilization assignment to ADC (a total of 52 squadrons). At the end of June 1953, therefore, the total of 298 F-51 aircraft allocated to the ANG gave an average of between five and six per squadron. Plans called for increasing the number of aircraft available to the ANG from 298 to 830 (including 94 F-94B all-weather interceptors and 208 F-86F jet fighters), but that lay in the future and was only a planning figure.[6]

(U) Meanwhile, the test of the ANG alert concept was conducted in the spring of 1953. When the pilots and aircraft at Hancock and Hayward were ready, each of the two squadrons maintained two aircraft on five-minute alert from

5. Ltr, USAF to ADC, "Use of Inactive Air National Guard Units for Air Defense," 4 Dec 52 (Doc 463 in Hist of 32nd Air Div, Jan-Jun 1953); Memo, DCS/O, ADC to Cmdr, ADC, "Progress Report on Use of ANG Units for Air Defense," 23 Dec 52 (Doc 86 in ADC Hist Study No. 5).

6. Memo, Operations and Training Division, ADC for DCS/O, ADC, "ANG Augmentation Plan," 16 Jun 53 (Doc 99 in Hist of ADC, Jan-Jun 1953).

one hour before sunrise to one hour after sunset each day. The test was somewhat slow in getting started, since the National Guard Bureau explained that 60 to 90 days would be required to obtain the required volunteers and obtain agreement from the states of California and New York. After the test actually began on 1 March 1953, however, ADC was enthusiastic about the results. The two ANG alert squadrons performed in a highly satisfactory manner and ADC was anxious to have the alert concept expanded to include other ANG squadrons.[7]

(U) By 18 May 1953 ADC was ready with a list of the 13 additional ANG squadrons it wanted to bring into the alert program as soon as possible. These, it informed the NGB were the following:[8]

Squadron	Location
101	Boston, Massachusetts
103	Philadelphia, Pennsylvania
104	Baltimore, Maryland
115	Van Nuys, California
126	Milwaukee, Wisconsin
133	Manchester, New Hampshire
137	White Plains, New York
148	Reading, Pennsylvania
165	Louisville, Kentucky

7. Ltr, ADC to ConAC, "Test of Inactive Air National Guard Units for Air Defense," 28 Jan 53 (Doc 87 in ADC Hist Study No. 5); Ltr, 28th AD to WADF, "Use of ANG Units for Air Defense Test," 24 Feb 53 (Doc 88 in ADC Hist Study No. 5); Hist of ADC, Jan-Jun 1953, pp 109-110.

8. Ltr, ADC to NGB, "Air National Guard Defense Augmentation," 18 May 53 (Doc 102 in Hist of ADC, Jan-Jun 1953).

Squadron	Location
169	Peoria, Illinois
172	Battle Creek, Michigan
175	Sioux Falls, South Dakota
178	Fargo, North Dakota

(U) These ADC hopes vanished, however, when the NGB informed ADC, on 8 June 1953, that the continuing shortage of ANG aircraft would not only make it impossible to expand the number of ANG squadrons standing alert from two to 15, but would also make it necessary to discontinue the test at Hancock and Hayward on 30 June. USAF also balked at providing the 75 active-duty positions needed for an ANG alert force of 15 squadrons. ADC was forced to conclude, in August 1953, that the plan for alert ANG crews and aircraft would have to be held in abeyance until the necessary personnel and aircraft were available.[9]

(U) In October 1953, however, USAF decided that it would, after all, be possible to allocate ADC the 75 personnel authorizations needed to put 15 ANG squadrons on dawn-to-dusk alert. There was also increasing evidence that the ANG would have sufficient numbers of jet aircraft by the

9. Ltr, ADC, thru USAF, to NGB, "Air National Guard Air Defense Augmentation," 9 Jun 53 and two indorsements thereto (Doc 101 to Hist of ADC, Jan-Jun 1953).

end of Fiscal Year 1954 to support the alert stance favored by ADC.[10]

(U) Meanwhile, ADC had changed its mind about how to utilize the proposed ANG alert force. By the end of Fiscal Year 1954 seven ANG squadrons were scheduled to receive F-94A/B all-weather interceptors, the first specific air defense aircraft ever assigned to the ANG. The F-94 was a two-place interceptor, so ADC requested that the number of active duty personnel authorized the ANG be increased from 75 to 90 for Fiscal Year 1954 in order to make possible the placing of 15 radar observers at three of the F-94 squadrons. If this was done, ADC proposed that ANG squadrons begin standing alert again on 1 April 1954. USAF agreed to increase the ANG active duty authorization for FY 1954 to 90 and for FY 1955 to 151 (eight two-man crews at each of six around-the-clock F-94 bases and five crews at 11 day-fighter bases).[11]

(U) While preparations for the ANG alert were going forward, the number of ANG squadrons under ADC cognizance was increased, in November 1953, from 52 to 70. Every

10. 3d Ind (Ltr, ADC to USAF, "Air National Guard Air Defense Augmentation," 9 Jun 53), USAF to ADC, 29 Oct 53 (Doc 91 in ADC Hist Study No. 5).

11. 4th Ind (Ltr, ADC to USAF, "Air National Guard Air Defense Augmentation," 9 Jun 53), ADC to USAF, 7 Dec 53 (Doc 92 in ADC Hist Study No. 5); 5th Ind (Ltr, ADC to USAF, "Air National Guard Air Defense Augmentation," 9 Jun 53), USAF to ADC, undated but about 5 Jan 54 (Doc 93 in ADC Hist Study No. 5).

fighter squadron allocated to the ANG was included. Nineteen of that number were fighter-interceptor squadrons (FIS), intended solely for air defense use. The remaining 51 were fighter-bomber squadrons (FBS) that held a dual mission. Although their initial combat action was expected to be air defense, it was understood that they would later be used in the fighter-bomber role. The squadrons comprising both groups are shown in Table 2.

(U) It did not prove possible to commence the revived ANG alert on 1 April 1954. The reasons were many. One involved the inability of the ANG to recruit radar observers for the F-94. The National Guard Bureau believed the difficulty lay in the fact that prospective recruits could see no future for the radar observer when his days of active flying were through. Also, radar observer training took 10 months and very few ANG members could spare 10 months away from their civilian jobs. The ANG had received only two applications for radar observer training by the end of October 1953.[12]

(U) The most important reason for failure to realize the April 1954 goal, however, was NGB insistence that 10 civilian technicians would be required to support each ANG squadron holding alert responsibility--a total of 170 people.

12. Ltr, NGB to ADC, "Air National Guard Air Defense Augmentation," 12 Apr 54 (Doc 94 in ADC Hist Study No. 5).

Granting that the need probably existed, ADC requested that the NGB pursue the matter with USAF. Meanwhile, the 1 April 1954 date passed without authorization of the technicians and NGB informed ADC that alert would never be possible until these people were made available. In June 1954, though, USAF informed ADC that the cost of the 170 technicians would be financed in Fiscal Year 1955, although that cost would be charged to the ADC budget. With this roadblock removed, the NGB was ready to promise the establishment of a regular ANG alert force by September or October 1954.[13]

(U) Actually, the first eight ANG squadrons began standing alert on 15 August 1954. The initial group included the following:[14]

Squadron	Location	Aircraft
163 FBS	Fort Wayne, Indiana	F-51D
164 FBS	Mansfield, Ohio	F-80
166 FBS	Columbus, Ohio	F-80
170 FBS	Springfield, Illinois	F-86E
175 FIS	Sioux Falls, South Dakota	F-51D
178 FIS	Fargo, North Dakota	F-51D
181 FBS	Dallas, Texas	F-80
194 FBS	Hayward, California	F-86A

The remaining nine squadrons assumed alert status on 1 October 1954:

13. Memo, DCS/O, ADC for Cmdr, ADC, "Visit by General Wilson," 15 Jul 54 (Doc 308 in Hist of ADC, Jul-Dec 1954).

14. Hist of ADC, Jul-Dec 1954, pp 96-97; Msg ADOOT-B2 1339, ADC to Defense Forces, 30 Jul 54 (Doc 310 in Hist of ADC, Jul-Dec 1954).

Squadron	Location	Aircraft
101 FIS	Boston, Massachusetts	F-94
115 FBS	Van Nuys, California	F-86F
126 FIS	Milwaukee, Wisconsin	F-86A
131 FIS	Westfield, Massachusetts	F-94
133 FIS	Manchester, New Hampshire	F-94
137 FIS	White Plains, New York	F-94
138 FIS	Syracuse, New York	F-94
158 FBS	Savannah, Georgia	F-84D
172 FBS	Battle Creek, Michigan	F-86E

(U) While ADC was pleased with the added air defense capability provided by the ANG alert force, there was an uncomfortable feeling within the regular Air Force that the politically oriented ANG might be harboring ideas of picking up the air defense ball and running with it. Major General Wiley D. Ganey, Director of Operations for HQ USAF expressed some misgivings in a November 1954 letter to Maj. Gen. Kenneth P. Bergquist, ADC DCS/Operations. General Ganey wanted ADC to consider the possibility that the ANG might, by political pressure, seek more modern equipment and thereby lay claim to a significant segment of the air defense mission. General Bergquist replied that ADC was well aware of the political clout wielded by the ANG, but that the ANG alert program had provided an increase in total air defense at relatively little cost and was eminently worthwhile. Nevertheless, despite the apparent desire of the NGB, and some elements in USAF, to expand ANG participation in air defense, General Bergquist assured General Ganey that ADC would think long before expanding the ANG alert force

beyond the 17 squadrons currently participating. "We will try," he concluded, "to walk the tightrope between our requirements and the increased influence of the Guard."[15]

(U) Prior to 1954, responsibility for the training and inspection of ANG units was borne by ConAC. In 1954, however, a campaign to transfer the training and inspection function to the using command (such as ADC) was begun. Apparently the impetus behind this campaign came from the ANG. Against rising pressure, USAF took pains to confirm, in March 1954, that these functions continued to rest with ConAC. But the campaign did not stop. ADC strongly opposed such a transfer of function and in August 1954 General Benjamin W. Chidlaw, ADC commander, found it necessary to point out to USAF that the principal reason for the separation of ADC from ConAC in 1951 was that ConAC was becoming too embroiled in reserve activities. General Chidlaw was of the opinion that ADC should concentrate on air defense and that the training and inspection of ANG units would dilute that concentration. The ADC position had not changed at the end of 1954, although the issue was far from settlement.[16]

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15. Ltr, Maj. Gen. Kenneth P. Bergquist, DCS/O, ADC to Maj. Gen. Wiley P. Ganey, Dir/Operations, DCS/O, USAF, no subj, 9 Dec 54 (Doc 319 in Hist of ADC, Jul-Dec 1954); Ganey to Bergquist, 18 Nov 54 (Doc 319 in Hist of ADC, Jul-Dec 1954).

16. Ltr, USAF to ADC, "Responsibilities for the Training of the Units of the Air Reserve Forces," 12 Mar 54 (Doc 323 in Hist of ADC, Jul-Dec 1954); Gen. Benjamin W. Chidlaw,

(U) Tactical Air Command, which would take control of the ANG fighter-bomber squadrons 90 days after mobilization on D-day, perceived a unique contradiction in the situation as it existed in late 1954. While ADC was interested only in the squadrons themselves as an air defense resource, the parent ANG Wings would come under TAC jurisdiction immediately upon federalization, while the subsidiary squadrons would not be available until 90 days later. It was the TAC position, made known to USAF on 11 October 1954, that the administrative integrity of the ANG Wings should be maintained from peacetime, through the 90-day air defense period after mobilization and into the wartime fighter-bomber phase. In short, TAC felt the whole ANG fighter-bomber complex should be controlled by one command, not split two ways.[17]

(U) ADC did not disagree with TAC, arguing only that it could find no place within the ADC organization, either in peace or war, for the ANG Wing. So long as it was assured that the ANG squadrons would be available to it on D-day, or for peacetime alert status, ADC did not really

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16. (cont) Cmdr, ADC to Gen. Thomas D. White, C/S, USAF, no subj, 7 Aug 54 (Doc 328 in Hist of ADC, Jul-Dec 1954); Msg, ADHCS 134, ADC to Ramey AFB, P. R. (site of USAF Commanders' Conference), 18 Jan 55 (Doc 329 in Hist of ADC, Jul-Dec 1954).

17. Ltr, TAC to USAF, "Mobilization Mission for Air National Guard Fighter-Bomber Squadron and Wings," 11 Oct 54 (Doc 341 in Hist of ADC, Jul-Dec 1954).

care who had administrative control of the ANG Wings and their support squadrons.[18]

(U) The anomaly continued, however, and in March 1955 USAF broached a solution that involved designating the 51 ANG squadrons currently carried as "fighter-bomber" squadrons to "fighter-interceptor" squadrons as soon as all-weather interceptor aircraft were available. Meanwhile, USAF proposed, these squadrons would continue to train as day-fighter squadrons. ADC agreed, in May 1955, to assume mobilization jurisdiction over the 70 ANG fighter squadrons and their parent Wings, with the proviso that the Wings would not be federalized when the squadrons were mobilized. Wing personnel were to be called to active duty, as individuals, to fit the requirements of the air defense system.[19]

(U) The 17 ANG squadrons which provided two aircraft on five-minute dawn-to-dusk alert beginning 1 October 1954 were still doing so at the middle of 1955, but ADC had plans for changing the ANG alert procedure. In the spring of 1955, ADC prepared a tentative alert plan which would place 19 ANG squadrons on "permanent" alert, with 48 other squadrons

18. 2d Ind (Ltr, TAC to USAF, "Mobilization Mission for Air National Guard Fighter-Bomber Squadrons and Wings," 11 Oct 54), ADC to USAF, 12 Jan 55 (Doc 341 in Hist of ADC, Jul-Dec 1954).

19. Ltr, USAF to ADC, "Designation of ANG Fighter Units," 2 Mar 55 (Doc 381 in Hist of ADC, Jan-Jun 1955); Ltr, ADC to USAF, "Air National Guard Reorganization," 13 May 55 (Doc 379 in Hist of ADC, Jan-Jun 1955).

on "rotating" alert. The 19 permanently alert squadrons would not necessarily include all 17 of those currently in this status, but would use squadrons located in areas where the interceptor coverage provided by the regular ADC fighter force was thin or non-existent. The 48 rotating squadrons would stand alert in groups of 16, with the mission rotated every year. Under this plan, all of the 48 rotating squadrons would have alert responsibility one year in every three. The ANG squadrons located in Denver (120th), Cheyenne (187th) and Salt Lake City (191st) were not included in either group, because no search radar was programmed for construction within 200 miles of any of these cities and alert was therefore impractical. This plan was forwarded to USAF on 13 May 1955.[20]

(U) The revised ADC plan for the ANG alert force was eventually accepted by both USAF and the NGB, but only after long months of study. Finally, on 15 October 1955, USAF directed ADC to proceed as outlined, effective 1 July 1956. The 70 ANG fighter squadrons were all designated "fighter interceptor" squadrons, regardless of the type of aircraft available. The 19 "permanent" ANG alert squadrons in the new plan included only four of the 17 which began alert

20. Memo, Dir/Operations and Training, ADC for DCS/O, ADC, "Air National Guard Air Alert Program," 9 Mar 55 (Doc 375 in Hist of ADC, Jan-Jun 1955); Ltr, ADC to USAF, "Revision of the Air National Guard Air Alert Plan," 13 May 55 (Doc 374 in Hist of ADC, Jan-Jun 1955).

operations in 1954--the 170th at Springfield, Illinois; 175th at Sioux Falls, South Dakota; 178th at Fargo, North Dakota; and 181st at Dallas, Texas. The 13 more scheduled to join the permanent alert force on 1 July 1956 were:

Squadron	Location
111	Houston, Texas
124	Des Moines, Iowa
125	Tulsa, Oklahoma
127	Wichita, Kansas
128	Marietta, Georgia
132	Bangor, Maine
156	Charlotte, North Carolina
165	Louisville, Kentucky
173	Lincoln, Nebraska
182	San Antonio, Texas
192	Reno, Nevada
194	Fresno, California
197	Phoenix, Arizona

The other two selections were only tentative. The 159th FIS at Jacksonville, Florida, was expected to assume alert operations 1 October 1956 if the nearby radar installation (M-114) became operational on schedule. Similarly, the 190th at Boise, Idaho, was to assume alert status on 1 January 1957 if the radar at Baker, Oregon (SM-149) was ready.[21]

(U) The remaining 50 ANG fighter squadrons[22] were divided

21. Incl 1 to 1st Ind (Ltr, USAF to ADC, "Revision of the Air National Guard Air Alert Plan," 15 Oct 55), ADC to USAF, 23 Nov 55 (Doc 284 in Hist of ADC, Jul-Dec 1955).

22. The total number of ANG fighter squadrons was reduced from 70 to 69 when the 152nd FIS at Providence, Rhode Island, was disbanded in 1955. Also, the designation of the 1st FBS (Fort Dix, New Jersey) was changed to 141st FIS and that of the 7th FBS (Philadelphia) was changed to 117th FIS. Further, the locations of squadrons within states were occasionally changed.

into three groups of 16 or 17 squadrons, each group to carry alert responsibility one year at a time. The squadrons at Denver, Cheyenne and Salt Lake were put back into the rotational alert program after it was established that the ANG would operate radar stations at Boulder, Colorado, and Salt Lake. The first rotational group was to stand alert during FY 1957, the second during FY 1958, the third during FY 1959. Then, presumably, the sequence of rotations would be repeated. Therefore, when all 19 of the permanently alert squadrons became operational the air defense system would be augmented by 35 or 36 alert ANG squadrons. The initial rotational group (FY 1957) was as follows:[23]

Squadron	Location
113	Terre Haute, Indiana
116	Spokane, Washington
117	Philadelphia, Pennsylvania
118	Windsor Locks, Connecticut
120	Denver, Colorado
126	Milwaukee, Wisconsin
131	Westfield, Massachusetts
139	Schenectady, New York
142	New Castle, Delaware
164	Mansfield, Ohio
166	Columbus, Ohio
172	Battle Creek, Michigan
179	Duluth, Minnesota
185	Oklahoma City, Oklahoma
188	Albuquerque, New Mexico
195	Van Nuys, California

(U) The alert group for FY 1958 included:[24]

23. Incl 2 to 1st Ind (Ltr, USAF to ADC, "Revision of the Air National Guard Air Alert Plan," 15 Oct 55), ADC to USAF, 23 Nov 55 (Doc 284 in Hist of ADC, Jul-Dec 1955).

24. Incl 3 to 1st Ind (Ltr, USAF to ADC, "Revision of the Air National Guard Air Alert Plan," 15 Oct 55), ADC to

Squadron	Location
101	Boston, Massachusetts
103	Philadelphia, Pennsylvania
121	Andrews AFB, Maryland
123	Portland, Oregon
134	Burlington, Vermont
136	Niagara Falls, New York
137	White Plains, New York
141	Fort Dix, New Jersey
146	Pittsburgh, Pennsylvania
157	Eastover, South Carolina
162	Springfield, Ohio
168	Chicago, Illinois
171	Detroit, Michigan
174	Sioux City, Iowa
176	Madison, Wisconsin
187	Cheyenne, Wyoming
196	Ontario, California

(U) The third group of rotating alert squadrons (FY 1959):[25]

Squadron	Location
104	Baltimore, Maryland
107	Detroit, Michigan
108	Chicago, Illinois
109	St. Paul, Minnesota
112	Akron-Canton, Ohio
115	Van Nuys, California
119	Newark, New Jersey
133	Manchester, New Hampshire
138	Syracuse, New York
147	Pittsburgh, Pennsylvania
148	Reading, Pennsylvania
158	Savannah, Georgia
163	Fort Wayne, Indiana
167	Charleston, West Virginia
169	Peoria, Illinois
186	Great Falls, Montana
191	Salt Lake City, Utah

24. (cont) USAF, 23 Nov 55 (Doc 284 in Hist of ADC, Jul-Dec 1955).

25. Incl 4 to 1st Ind (Ltr, USAF to ADC, "Revision of the Air National Guard Air Alert Plan," 15 Oct 55), ADC to USAF, 23 Nov 55 (Doc 284 in Hist of ADC, Jul-Dec 1955).

(U) With all ANG fighter squadrons assigned an air defense mission, it could be assumed that all ANG units would eventually be equipped with all-weather interceptors. But only a handful were so equipped (mostly F-94A/B aircraft) at the end of 1955 and it was becoming fairly obvious that not all ANG fighter squadrons would ever be so equipped. National Guard Bureau planning at that time forecast that no more than 46 of the 69 ANG fighter squadrons would receive all-weather interceptors.[26]

(U) Although ADC assumed that it would have the authority to order ANG fighter squadrons to active duty in an emergency, such authority, in fact, did not exist in late 1955. While the Reserve Forces Act of 1955 (Public Law 305), passed by Congress in the summer of 1955, gave the President the authority to order a million reserves to active duty, ADC was not clear as to how this authority could be applied quickly with respect to ADC/ANG fighter squadrons. The problem arose from the proviso in the 1955 legislation that this authority could not be exercised until a national emergency had been proclaimed by either the President or Congress. In November of 1955, USAF was

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26. Memo, DCS/O, ADC for C/S, ADC, "ANG Aircraft Equipping Program," 29 Sep 55 (Doc 290 in Hist of ADC, Jul-Dec 1955); 1st Ind (Ltr, CADF to ADC, "Re-equipping of Air National Guard Squadrons with All-Weather Aircraft," 28 Dec 55), ADC to CADF, 9 Jan 56 (Doc 291 in Hist of ADC, Jul-Dec 1955).

preparing a proposed procedure by which the commander of ADC could order ANG units to active duty immediately upon the Presidential or Congressional declaration. ADC, however, did not think this provision was adequate since the required declaration might not be forthcoming for hours or even days after an attack. Meanwhile, ADC told the Air Defense Forces that immediately upon the entry of hostile bombers into the air defense surveillance system, ADC would request the declaration of a national emergency. At the same time, the commanders of air defense divisions (subordinate to the Air Defense Forces) were to request ANG squadron commanders to execute their recall plans. Hopefully, by the time the recall action was complete the required national emergency would have been declared. Though the ADC plans were not strictly legal, Maj. Gen. Frederic H. Smith, Jr., ADC vice commander, wrote Maj. Gen. Roy H. Lynn, WADF commander, on 25 November 1955, that "we all know that if hostile aircraft are detected en route to our country we will act first and think of the legalities later."[27] Operation STOP WATCH, the ANG recall test of October 1955, led ADC to the

27. Ltr, Maj. Gen. Frederic H. Smith, Jr., V/C, ADC to Maj. Gen. Roy H. Lynn, Cmdr, WADF, no subj, 25 Nov 55 (Doc 287 in Hist of ADC, Jul-Dec 1955); Ltr, Smith to Lt. Gen. Frank F. Everest, DCS/O, USAF, no subj, 8 Oct 55 (Doc 285 in Hist of ADC, Jul-Dec 1955); Ltr, Everest to Smith, no subj, 7 Nov 55 (Doc 286 in Hist of ADC, Jul-Dec 1955).

conclusion that about half the ANG force could be ready for combat within two hours of notification.[28]

(U) The plans for an augmented ANG alert force of 35-36 squadrons foundered on the rock of personnel shortages in the spring of 1956. USAF announced, in March, that it could support only the "permanent" alert force of 19 squadrons. This redeployed force was generally in position by the planned date of 1 July 1956. At that time only five squadrons of the new alert force were not ready. The 158th (Savannah) was to continue on alert status in place of the 128th (Marietta) until 30 September 1956 or until such time as the ground radar in the Atlanta area became operational. Similarly, the 115th (Van Nuys) was to substitute for the 190th (Boise) until another radar was ready, probably about the end of 1956. The other three delays involved aircraft conversions. The 166th (Columbus) would probably remain in place of the 182nd (San Antonio) and the 163rd (Fort Wayne) in place of the 159th (Jacksonville) until the end of 1956 for that reason. Finally, replacement of the 133rd (Manchester) by the 165th (Louisville) was likely to be delayed until June 1957 because of the conversion problem.[29]

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28. Hist of ADC, Jul-Dec 1955, p 113.

29. Ltr, USAF to ADC, "Revised ANG Air Alert Plan," 5 Mar 56 (Doc 309 in Hist of ADC, Jan-Jun 1956); Permanent Alert Plan, ADC, undated but about July 1956 (Doc 305 in Hist of ADC, Jan-Jun 1956).

(U) At the middle of 1956 the ANG fighter squadrons were equipped with about 1,500 aircraft. Less than half (24 squadrons) possessed all-weather (F-86D, F-89B/C/D or F-94A/B/C) interceptors. Forty others had day jets of the F-80, F-84 or F-86A/E types. Five squadrons were still equipped with the propeller-driven F-51 Mustang.[30]

30. Hist of ADC, Jan-Jun 1956, p 59.

CHAPTER IV

REASSESSMENT OF THE ROLE OF THE AIR NATIONAL GUARD 1956-1958

(U) It was not until 1956 that Congress came to a full realization of the immense cost of the air defense system planned in the early fifties. In earlier years, while the various types of equipment were still under development, the cost was not large. But when firm production contracts were written for the actual hardware required in the improved air defense system, it became obvious that the cost was too great in terms of any defense budget Congress was likely to approve. Nearly every aspect of the air defense program suffered fund-induced reduction in 1956.

(U) So far as the ADC-oriented portion of the ANG was concerned, this was first recognized in the spring of 1956 when USAF revealed that it could not finance the cost of active-duty ANG aircrews in the numbers required for the ADC "rotational" alert program. As the year went along, plans for the equipping of the major portion of the ANG fighter force with all-weather interceptors also came under review. In early 1956 it was planned to equip 58 of the 69 ANG squadrons with all-weather interceptors by 1960. By November of 1956, however, ADC had come to the conclusion

that if funds were to become scarce and priorities had to be established the regular force should take precedence over the ANG. Therefore, ADC began to oppose equipping ANG squadrons with complicated missile-firing interceptors that were probably beyond the capability of the ANG to maintain and operate effectively. Instead, ADC recommended (in a complete change of direction from earlier recommendations) that no more than 30 percent of the ANG fighter squadrons receive all-weather interceptors, with another 30 percent receiving day fighters of the proposed F-100 and F-104 types. The remainder, in the ADC view, should be diverted to air rescue and air transport missions. Also, ADC recommended that the ANG interceptor force of the future be limited to F-86D, because the F-89D and F-94C required two-man crews and were difficult for the ANG to man.[1]

(U) ADC also managed, in late 1956, to obtain relief from one onerous chore as regards the ANG--the provision of facilities and personnel for the maintenance of ANG mobilization reserve materiel (MRM). Because of shortages of funds and personnel, ADC asked to be relieved of this responsibility and USAF and the National Guard Bureau agreed. Henceforth, ADC was obligated only to prepare quantitative requirements, indicate where and when materiel should be

1. Ltr, ADC to USAF, "Air Defense Command Policy on Reserve Components in Air Defense," 14 Nov 56 (Doc 199 in Hist of ADC, Jul-Dec 1956).

stored and furnish the ANG with technical guidance concerning storage and maintenance. The ANG assumed responsibility for funding, construction, security, maintenance and storage of MRM. Pending completion of the MRM project, ADC agreed, in November 1956, to provide two loads of ammunition for each ANG aircraft, plus sufficient additional equipment to permit four combat sorties, wherever ANG bases had the necessary storage space.[2]

(U) Before the ADC/ANG fighter force got any smaller, however, it got larger. Seven squadrons (for a total of 76 squadrons) were added in early 1957. Those added were the 102nd and 114th at Brooklyn Naval Air Station in New York; 110th at St. Louis, Missouri; 117th at Hutchinson, Kansas; 122nd at New Orleans, Louisiana; 149th at Byrd Field, Virginia; and the 180th at St. Joseph, Missouri.[3]

(U) Meanwhile, the November 1956 ADC request that no more than 30 percent of the ANG squadrons holding an air defense mission be equipped with all-weather interceptor aircraft drew no immediate response from USAF, so ADC repeated the request on 21 March 1957. The main thrust of

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2. 1st Ind (Ltr, USAF to ADC, "MRM for the Air National Guard," 8 Aug 56), ADC to USAF, 14 Aug 56 (Doc 201 in Hist of ADC, Jul-Dec 1956); Maj. Gen. M. S. Roth, Acting C/S, ADC to Maj. Gen. J. E. Smart, Asst Vice C/S, USAF, 20 Sep 56 (Doc 202 in Hist of ADC, Jul-Dec 1956); Msg, ADC to USAF, 16 Nov 56 (Doc 203 in Hist of ADC, Jul-Dec 1956); Msg, ADC to Defense Forces, 23 Nov 56 (Doc 204 in Hist of ADC, Jul-Dec 1956).

3. Hist of ADC, Jan-Jun 1957, p 156.

the reiterated statement was that insufficient funds were likely to be available to support a large number of ANG squadrons equipped with modern all-weather interceptors, especially those carrying a two-man crew. USAF responded, on 8 April 1957, to the extent of providing ADC a list of 30 ANG squadrons it believed should have priority on available all-weather aircraft, but asked that ADC review the list and justify any changes requested.[4]

(U) As a result of the requested review, ADC asked for the substitution of only one squadron (the 127th at Wichita for the 117th at Hutchinson). This substitution was requested on the grounds that the 127th was a going concern, while the Hutchinson squadron was just being organized. Within the priority listing, ADC requested numerous changes. The comparison is shown in Table 3.

(U) At the middle of 1957 the ANG force dedicated to air defense was large, but not well equipped from an air defense standpoint. Ten of the 76 squadrons had no tactical aircraft at all. Only four had modern interceptors. Two had the F-94C, one had the F-86D and one had the F-89D. Twenty others were equipped with second-line interceptors--F-89B/C and F-94A/B. The remaining 42 squadrons had day

4. Ltr, ADC to USAF, "ADC Command Policy on Reserve Components in Air Defense," 21 Mar 57 (Doc 319 in Hist of ADC, Jan-Jun 1957); Msg AFOOP-OC 54573, USAF to ADC, 8 Apr 57 (Doc 320 in Hist of ADC, Jan-Jun 1957).

fighters of the F-80, F-84 and F-86 types. ADC was looking forward to the day when the ANG squadrons destined for all-weather interceptors would be equipped with the one-place F-86D. Meanwhile, 19 ANG squadrons continued to stand dawn-to-dusk alert.[5]

(U) The long-standing ADC request to reduce the number of ANG squadrons answerable to ADC to a more manageable total of 30-40 squadrons was partially granted before the end of 1957, although USAF reduced the total only slightly--to 55 squadrons, about halfway between the ADC request and the total of 76 squadrons which had previously carried air defense responsibility. The 55 ANG squadrons which retained an air defense mission at the end of 1957 are given in Table 4.

(U) The first proposal for air defense use of the Air National Guard in other than the manned interceptor role surfaced in the summer of 1957, when it was suggested that ANG personnel might be useful in the operation of BOMARC, the developing interceptor missile. In the beginning ADC was receptive to such use of the ANG and in August 1957 provided USAF a plan outlining the integration of ANG personnel into BOMARC operations. On second thought, however, ADC reached the conclusion that it not only did not encourage such use of the ANG, but strongly objected to "diversion

5. Hist of ADC, Jan-Jun 1957, pp 156-160.

of the BOMARC missile to reserve components so long as initial models of this weapon constitute a first line resource."[6] This change in position, ADC informed USAF on 27 December 1957, was based on more mature consideration of such factors as command control and political implications, confidence in operational capability, development and maintenance of a qualified and dedicated corps of regular Air Force technicians for support of this and subsequent air defense missile programs and adverse recruitment, rotational and retention problems which might arise among regulars if the ANG manned some of the more favorable locations. Therefore, ADC felt that any consideration of ANG in connection with BOMARC was several years premature and requested that a planned January 1958 conference on the subject be cancelled.[7]

(U) Although the January meeting was cancelled as requested, National Guard interest continued and the subject was far from being a dead issue in view of the political muscle exhibited by the Guard. Therefore, a discussion of ANG participation in BOMARC did take place at USAF on 15 May 1958. The ADC position was still unchanged from the stance

6. Msg, ADORQ-C 501, ADC to USAF, 27 Dec 57 (Doc 292 in Hist of ADC, Jul-Dec 1957).
7. Ibid.

taken in December 1957 and no immediate action was taken to bring ANG into the interceptor missile program.[8]

(U) The size of the ADC/ANG interceptor force shrunk still further in 1958 when 14 fighter squadrons had their M-day allegiance transferred from ADC to TAC. This brought the group responsible to ADC down to 41 squadrons and relatively close to the 1956 ADC recommendation that 30-40 squadrons were probably the ideal number. The squadrons relieved of air defense responsibility were the following:[9]

Squadron	Location
101	Boston, Massachusetts
102	New York NAS, New York
103	Philadelphia, Pennsylvania
104	Baltimore, Maryland
115	Van Nuys, California
118	Windsor Locks, Connecticut
121	Andrews AFB, Maryland
131	Westfield, Massachusetts
136	Niagara Falls, New York
137	White Plains, New York
138	Syracuse, New York
139	Schenectady, New York
142	Wilmington, Delaware
167	Martinsburg, West Virginia

All of these, except the 115th at Van Nuys, were located in the densely populated northeast, where regular ADC squadrons were present in considerable numbers.

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8. Msg, ADORQ-C 335, ADC to USAF, 14 May 58 (Doc 178 in Hist of ADC, 1958); Hist of ADC, 1958, pp 146-147.

9. Hist of ADC, Jul-Dec 1957, p 123; Hist of ADC, 1958, p 144.

CHAPTER V

THE CHANGING ALERT FORCE 1959-1960

[redacted] At the end of 1958, ADC was generally resigned to the fact that it would be allowed only an ANG alert force of 19 squadrons. Since there was also pressure from the non-alert squadrons to share in this duty, however, eight previously non-alert squadrons replaced currently alert squadrons at various dates in 1958. Thus, in a sense, the rotational provisions of the earlier ADC plan were put into limited operation, although the total number of alert ANG squadrons did not exceed 19. The squadrons involved were:[1]

New Alert Squadrons		Replaced Alert Squadrons	
Sq	Location	Sq	Location
116	Spokane, Washington	124	Des Moines, Iowa
122	New Orleans, Louisiana	132	Bangor, Maine
123	Portland, Oregon	165	Louisville, Kentucky
137	White Plains, New York	170	Springfield, Illinois
151	Knoxville, Tennessee	181	Dallas, Texas
185	Oklahoma City, Oklahoma	190	Boise, Idaho
186	Great Falls, Montana	192	Reno, Nevada
191	Salt Lake City, Utah	194	Fresno, California

~~(S)(Gp 4)~~ Meanwhile, over the years, that portion of the ANG assigned to ADC was almost entirely outfitted with all-weather interceptors. At the middle of 1959 only two

1. Hist of ADC, 1958, p 148.

of these squadrons had day fighters--F-100A. Twenty-seven squadrons flew the F-86D/L, 10 had F-89D/H aircraft and two had the F-94C.

[redacted] The availability of second-line all-weather interceptors brought about a significant change in the nature of the ANG alert force in early 1959, because around-the-clock, rather than dawn-to-dusk, alert became feasible. It cost more, since 24-hour alert required that nine ANG aircrews (instead of the normal five) be retained on active duty at alert squadrons, but both ADC and USAF believed the additional capability justified the added cost. By the middle of 1959 six ANG squadrons were standing the 24-hour alert. Five were located along the southern border where regular ADC forces were spread thin. These were the 111th (Ellington AFB, Texas), 122nd (New Orleans, Louisiana), 159th (Jacksonville, Florida), 182nd (Kelly AFB, Texas) and 197th (Phoenix, Arizona). The sixth (178th at Fargo, North Dakota) was along the northern border. The 122nd and 182nd flew the F-86D, the 111th, 159th and 197th the more modern F-86L (the "L" signified that the aircraft was equipped with data-link components that permitted operation within the SAGE ground environment. The 178th had the two-place F-89D.[2]

2. Hist of ADC, Jan-Jun 1959, pp 191-192.

[redacted] Also, in early 1959, sufficient active duty personnel spaces were made available for ANG use to permit an increase in the ANG alert force from 19 to 22 squadrons. As a result, while six squadrons ceased carrying the alert responsibility during the first half of 1959, nine others picked up the burden. The changes, as of 30 June 1959, were as follows:[3]

Added to the Alert Force		Released from Alert	
Sq	Location	Sq	Location
109	Minneapolis, Minnesota	125	Tulsa, Oklahoma
120	Denver, Colorado	127	McConnell AFB, Kansas
133	Grenier AFB, New Hampshire	128	Dobbins AFB, Georgia
146	Pittsburgh, Pennsylvania	137	White Plains, New York
147	Pittsburgh, Pennsylvania	156	Charlotte, North Carolina
152	Tucson, Arizona	175	Sioux Falls, South Dakota
157	Eastover, South Carolina		
187	Cheyenne, Wyoming		
196	Ontario, California		

[redacted] Despite the increase in the size and capability of the ANG alert force, EADF, in the spring of 1959, recommended to ADC that the responsibilities of the ANG in the provision of alert forces be increased, at least in the EADF jurisdiction. Meanwhile, the ANG continued to press for a stake in BOMARC operations. This combination of circumstances apparently impelled Lieutenant General Joseph H. Atkinson, ADC commander, to assume a bitterly hostile attitude toward the ANG. On 25 May 1959 he laid

3. Ibid.

[redacted]

his position before General Thomas D. White, Air Force Chief of Staff:[4]

> I am gravely disturbed by talk of equipping the ANG with BOMARC. Apparently a lot of people believe in cheap air defense as a part-time sideline of citizens who comprise the ANG. This is dangerous wishful thinking. It has not yet been applied to offense, although I miss the distinction in ability to man BOMARC, ATLAS or MINUTEMAN.
>
> The Reserve Forces should have no role in the air defense fighting forces. I vigorously oppose equipping them with first line weapons, manned or unmanned. Limited numbers of such weapons require that we guarantee peak performance in emergency. This demands immediate response to command not only in emergency but in the proficiency-building process which precedes it. "Command" by negotiation, persuasion and state politics will not do the job.
>
> I put little dependence on the ANG as emergency interceptor augmentation. Extensive experience convinces us that air defense is a full-time system job. Part-time training, mostly isolated from the system and unresponsive to the Air Defense Commander, simply will not produce successful system performance in sudden emergency. Expected return does not justify the high cost of this role for the ANG.
>
> Reserve Forces belong in minimum cost, minimum support missions which do not materially compete with us for resources. I recommend concerted effort to so employ them.

General Atkinson replied, in similar vein, to the request from EADF.[5]

[redacted] Whatever the feelings of General Atkinson, however, USAF asked ADC, on 29 May 1959, to participate in

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4. Ltr, Lt. Gen. Joseph H. Atkinson, Cmdr, ADC to Gen. Thomas D. White, C/S, USAF, "Policy on Reserve Forces," 25 May 59 (Doc 252 in Hist of ADC, Jan-Jun 1959).

5. Ltr, Atkinson to Maj. Gen. Edward H. Underhill, Cmdr, EADF, "Emergency ANG Fighter Unit Employment," 30 Jun 59 (Doc 253 in Hist of ADC, Jan-Jun 1959).

a many times-postponed conference on the utilization of ANG in BOMARC operation. When the time for the conference (late June 1959) approached, however, USAF announced that because of "current uncertainties as to possible extensive reduction in the total BOMARC program"[6] the scheduled meeting would not be held.

[redacted] General Atkinson subsequently discussed the subject of his 25 May letter with General White and reported to General Earle E. Partridge, NORAD commander, on 11 June 1959, that he "received no encouragement and anticipated little, if any, real support for my views."[7] General White explained his position later in June. The political nature of the problem was simple. "In developing plans for the utilization of Reserve Forces," General White pointed out, "I must also consider that the Administration and the Congress expect our Reserve Forces to perform an active function in U. S. defense. Any action to completely deny Air National Guard participation in air defense with newer weapons systems would meet with considerable opposition."[8] It was as simple as that.

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6. Msg, AFODC 52649, USAF to ADC, 24 Jun 59 (Doc 256 in Hist of ADC, Jan-Jun 1959).
7. Ltr, Atkinson to Gen. Earle E. Partridge, CINCNORAD, "Utilization of Reserve and National Guard Forces," 11 Jun 59 (Doc 254 in Hist of ADC, Jan-Jun 1959).
8. Ltr, White to Atkinson, no subj, 25 Jun 59 (Doc 255 in Hist of ADC, Jan-Jun 1959).

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[redacted] The long-simmering problem of ANG involvement with BOMARC was finally settled in the late summer of 1959, but in an unexpected manner. Because of the refusal of Congress to provide the funds necessary for the construction and equipment of the planned 32 BOMARC sites, the planned number was reduced to 16. In a BOMARC force of this size there was no place for an ANG unit, at least in the USAF/ADC view. Planning for ANG participation was dropped in August 1959.[9] (b)(3):42 USC § 2162 (Atomic Energy Act of 1954) [redacted]

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954) [redacted] ADC recommended, in November 1959, that these eight squadrons be limited to

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9. Msg, ADLPR C59-131, ADC to USAF, 20 Aug 59 (Doc 93 in Hist of ADC, Jul-Dec 1959).

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non-nuclear versions of the F-89, but this recommendation received no immediate reaction from any source. Meanwhile, ADC proposed to limit the training of ANG F-89J aircrews to methods of employment of the nuclear armament. No live warheads were to be provided the ANG. Upon federalization, of course, the ANG squadron became part of the regular force and nuclear warheads would be provided in the same manner they were furnished to ADC units.[10]

~~(C)(Gp-4)~~ In another area, however, ADC recommended modernization of the ANG interceptor force. Because the F-104 was not adequately equipped for all-weather interception, ADC planned to replace four squadrons flying F-104 aircraft with more suitable interceptors. Nevertheless, the F-104 was a high-speed, high-altitude jet that could counter the anticipated threat under certain conditions, so ADC recommended, again in November 1959, that the F-104 aircraft released by ADC be made available to the ANG.[11]

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

[redacted]

DOE (b)(3)

10. Msg, ADOOP-P 27-H-36, ADC to 30 AD, 27 Aug 59 (Doc 88 in Hist of ADC, Jul-Dec 1959); Msg, ADOOP-P 12-K-29, ADC to USAF, 12 Nov 59 (Doc 89 in Hist of ADC, Jul-Dec 1959); Msg, ADOOP-WM 51, ADC to 30 AD, 20 Nov 59 (Doc 90 in Hist of ADC, Jul-Dec 1959).

11. Msg, ADOOP-P 6-K-19, ADC to USAF, 6 Nov 59 (Doc 91 in Hist of ADC, Jul-Dec 1959).

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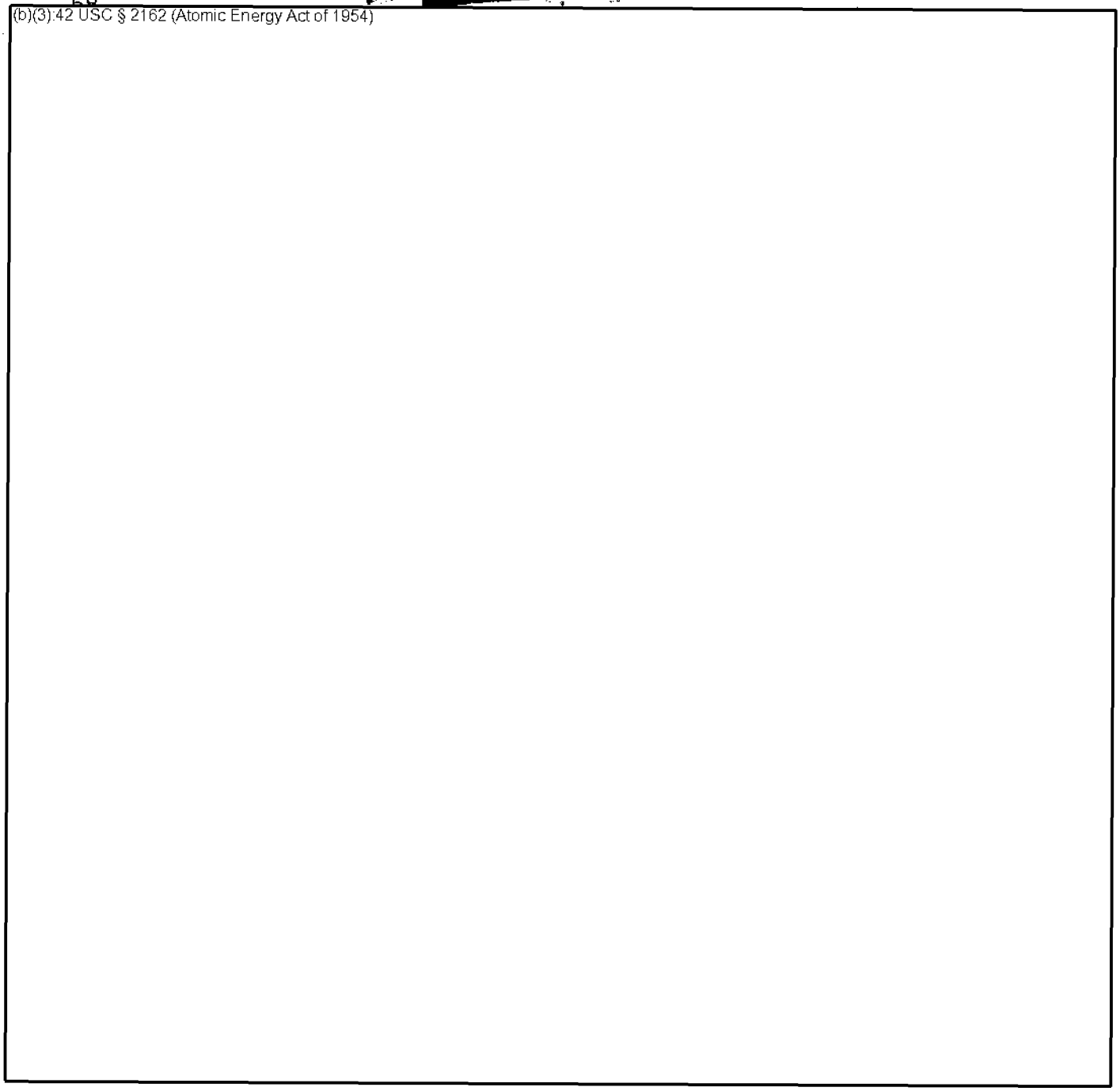
(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)



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12. Msg, ADLPG-IF 1341, ADC to USAF, 6 May 60 (Doc 169 in Hist of ADC, Jan-Jun 1960); Msg, AFOOP-DE 93571, USAF to ADC, 12 May 60 (Doc 170 in Hist of ADC, Jan-Jun 1960); Msg, ADOOP-WM 1450, ADC to WADF, 16 May 60 (Doc 171 in Hist of ADC, Jan-Jun 1960); Msg, ADOOP-WM 1491, ADC to USAF, 20 May 60 (Doc 172 in Hist of ADC, Jan-Jun 1960); Msg, 25ODC 332-G, 25 AD to ADC, 27 May 60 (Doc 173 in Hist of ADC, Jan-Jun 1960); Msg ADOOP-WI 1802, ADC to 25 AD, 21 Jun 69 (Doc 174 in Hist of ADC, Jan-Jun 1960); Msg ADOOP-WM 1812, ADC to

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[redacted] Three ANG squadrons--the 109th at Minneapolis, 125th at Tulsa and the 133rd at Grenier AFB--were inactivated in early 1960, thus reducing the number of squadrons under ADC cognizance to 39. Since two of these (the 109th and 133rd) were standing alert at the time of inactivation, the number on alert dropped to 19. Earlier action to rotate the alert at Pittsburgh between the 146th and 147th had reduced the alert group from 22 to 21 squadrons. Later in the year the 118th FIS at Bradley Field, Connecticut, was added to the ADC roster to bring the total to 40. By the end of 1960 there had been another thoroughgoing reshuffle of alert squadrons, with the exception of those on 24-hour duty. While the 197th at Phoenix was relieved of this duty, the other five that initiated the 24-hour alert stance were unchanged. The total number of alert squadrons again increased to 22, but the 17 on dawn-to-dusk duty changed considerably. These, at the end of 1960, were the following:[13]

Squadron	Location
103	Philadelphia, Pennsylvania
108	Chicago, Illinois
124	Des Moines, Iowa
126	Milwaukee, Wisconsin
127	Wichita, Kansas

12. (cont) NGB, 22 Jun 60 (Doc 175 in Hist of ADC, Jan-Jun 1960); Hist of ADC, Jul-Dec 1960, pp 174-176.

13. Hist of ADC, Jan-Jun 1960, p 98; Hist of ADC, Jul-Dec 1960, p 177.

[redacted]

Squadron	Location
128	Atlanta, Georgia
134	Burlington, Vermont
156	Charlotte, North Carolina
158	Savannah, Georgia
175	Sioux Falls, South Dakota
176	Madison, Wisconsin
179	Duluth, Minnesota
181	Dallas, Texas
188	Albuquerque, New Mexico
190	Boise, Idaho
192	Reno, Nevada
194	Fresno, California

Three of the around-the-clock squadrons were equipped with F-86L aircraft, one with the F-89J and one with the F-102A. Nine of the 17 squadrons on 14-hour alert had the F-86L and seven had the F-89J. The unit at Albuquerque flew the F-100.

[redacted] The remaining 18 ANG squadrons of the group committed to air defense were deployed in this manner:

Squadron	Location
116	Spokane, Washington
118	Bradley Field, Connecticut
120	Denver, Colorado
123	Portland, Oregon
132	Bangor, Maine
146	Pittsburgh, Pennsylvania
147	Pittsburgh, Pennsylvania
151	Knoxville, Tennessee
152	Tucson, Arizona
157	Eastover, South Carolina
173	Lincoln, Nebraska
185	Oklahoma City, Oklahoma
186	Great Falls, Montana
187	Cheyenne, Wyoming
191	Salt Lake City, Utah
196	Ontario, California
197	Phoenix, Arizona
198	San Juan, Puerto Rico

CHAPTER VI

THE TIES BECOME CLOSER
1961-1971

(U) The relationship between ADC and the ANG changed significantly on 1 July 1960 when ADC assumed responsibility for the supervision of training and the inspection of ANG squadrons. ADC also assumed jurisdiction over the aircraft accident prevention program. The National Guard Bureau retained supervision over logistics, budget administration and personnel. The change made General Atkinson much happier over the role of the ANG in air defense. "Under the new system," he wrote in a magazine article in the summer of 1960, "ANG training directives will be identical to those used daily by squadrons of the regular establishment. The training program will continue to be under the direction of the state Adjutants General, but now in accordance with Air Defense Command manuals."[1]

(S) Operating on the theory that ANG units should be trained, so far as possible, to the same level of proficiency as regular squadrons, ADC launched a rigorous training program. The ANG squadrons were required to participate in six training exercises every calendar quarter,

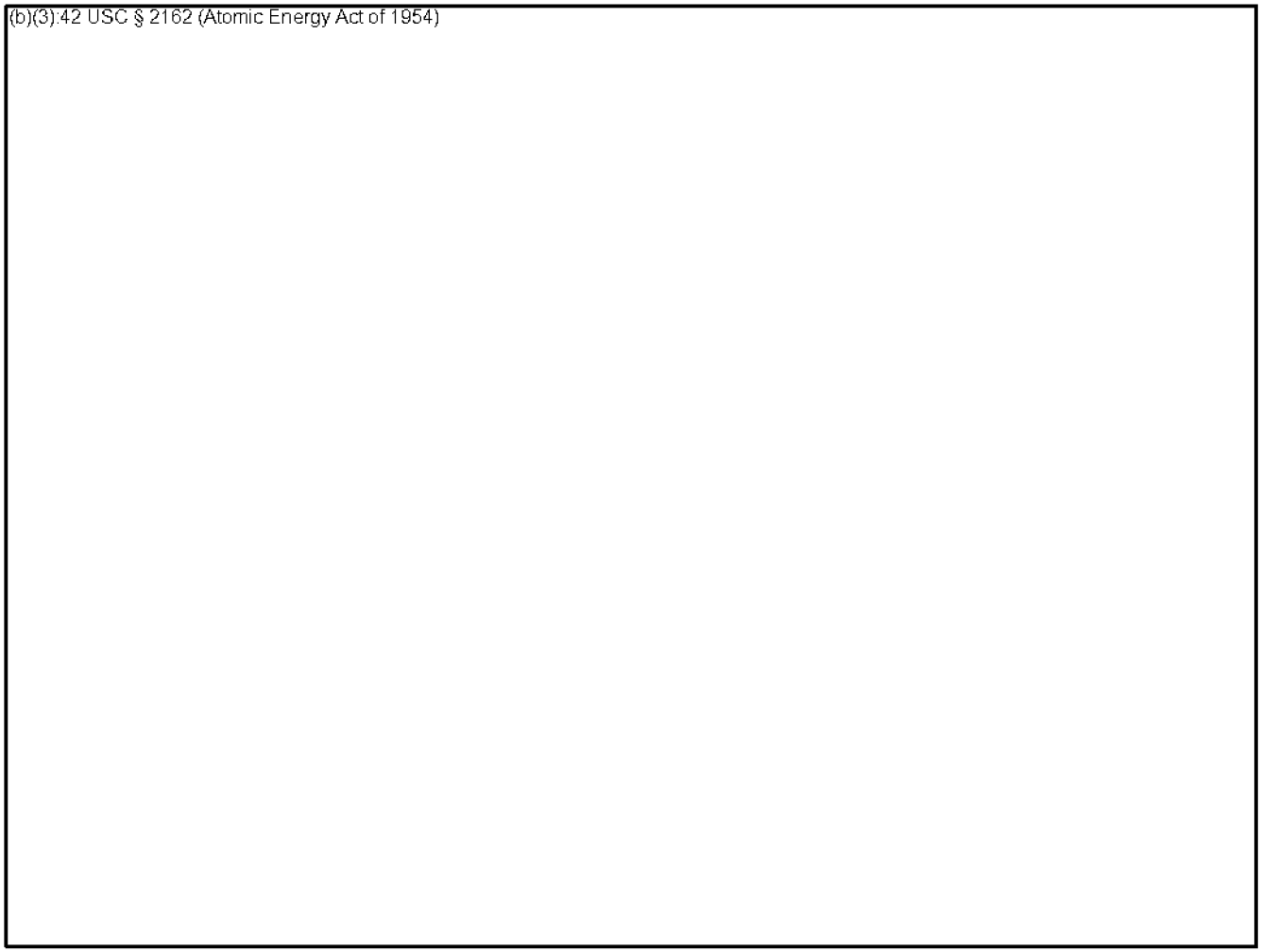
1. Lt. Gen. Joseph H. Atkinson, "Mission: Teamwork," Air Force Magazine and Space Digest, Jul 1960, p 113.

the same requirement placed on squadrons of the regular force. Also, ANG squadrons were required to undergo the same periodic tactical evaluation required of ADC units. Further, flights (six aircraft) of ANG interceptors were sent to the ADC Weapons Employment Center at Tyndall for a week of the same type of firing practice offered regular squadrons. Between August 1960 and the end of the year, 16 flights from seven ANG F-89J squadrons--the 116th, 126th, 132nd, 134th, 178th and 179th--made the training trip to Tyndall.[2]

The next step was to reorganize the ADC/ANG interceptor force into a smaller, but more tightly knit, organization. The existing force of 40 ANG squadrons was reduced to 29 during the first half of 1961, with three of these scheduled for transfer (the 103rd and 158th to MATS and the 181st to TAC) in 1962 and 1963. The 198th in Puerto Rico remained in the ADC fold, but was given no air alert responsibilities. The remaining 25 squadrons were given a larger share of responsibility for air defense when the entire group was directed to assume around-the-clock alert status on 1 July 1961. Each ANG squadron was allocated nine active-duty aircrews, with the understanding that the

2. Col. Paul Fojtik (ADC Assistant DCS/O for ANG Affairs), "The Guard Joins ADC," Interceptor, Sep 60, p 10; 1st Ind (Ltr, ADCIO-H to ADOOP, "Weapons Center Training," undated), ADOOP-WI, ADC, to ADCIO-H, 24 Mar 61 (Doc 200 in Hist of ADC, Jul-Dec 1960).

alert duty was to be rotated among the 30 aircrews authorized for each squadron. Active duty tours ranged from two days to the allowable maximum of 59 uninterrupted days. The average was 10 days. The alert requirement was for two operationally-ready aircraft and two combat-ready aircrews on five-minute alert, with a second pair of aircraft and crews to be ready in one hour. The 25 ANG squadrons charged with this duty on 1 July 1961 (and including the five squadrons already on around-the-clock alert) are listed in



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3. Hist of ADC, Jan-Jun 1961, pp 178-180.
4. ADC Hist Study No. 20, 'Nuclear Armament: Its

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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4. (cont) Acquisition, Control and Application to Manned Interceptors, 1951-1963," pp 83-89.
5. Ibid.

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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~~(C)(Gp 4)~~ The alert schedule was upset somewhat when three ANG F-104 squadrons (the 151st at Knoxville, 157th at Eastover and the 197th at Phoenix) were federalized on 9 October 1961 and transferred to TAC for overseas duty during one of the recurrent crises over Berlin. They were returned to the United States and ADC jurisdiction in the summer of 1962, but the Phoenix squadron traded its F-104 aircraft for C-97 transports and was assigned to MATS. After the Cuban Crisis of October 1962, the 151st and 157th surrendered their F-104 aircraft to the regular ADC force (one group of aircraft was used to reequip the 319th FIS at Homestead AFB, Florida, the other the 331st FIS at Webb AFB, Texas) and received F-102A interceptors in return. Meanwhile, in 1962, the 181st (Dallas) and 198th (Puerto Rico) began alert duty, bringing the total to 26.[7]

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6. Msg, ADCCR 100, ADC to USAF, 17 Jan 61 (Doc 366 in Hist of ADC, Jul-Dec 1960); Msg, AFOOP-DE 64760, USAF to ADC, 25 Sep 61 (Doc 462 in Hist of ADC, Jul-Dec 1961); Hist of ADC, Jul-Dec 1965, p 70.

7. Msg, NG-AFOTM 742884, NGB to ADC, 5 Feb 63 (Doc 2); Msg, ADMLP 384, ADC to NGB, 5 Feb 63 (Doc 3); Msg, ADOTT-D 647, ADC to 26 AD, 5 Mar 63 (Doc 4); Msg, ADOOP-WI 842, ADC to USAF, 20 Mar 63 (Doc 5); Msg, ADOTT-D 890, ADC to NGB, 22 Mar 63 (Doc 6); Msg, ADOOP-WI 712, ADC to 26 AD, 11 Mar 63 (Doc 7).

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(C)(Gp 4) Although earlier planning had scheduled the transfer of the 181st to TAC in 1963, it was not actually accomplished until 1965. Moving out of the air defense field in 1964 were the 151st (Knoxville), 173rd (Lincoln), 188th (Albuquerque) and 198th (Puerto Rico). The ADC/ANG air defense force in 1965 therefore amounted to 21 squadrons. At the end of that year 12 of these 21 ANG squadrons were equipped with the Century Series F-102A jet interceptor, second-line to be sure since the regular ADC force was flying, primarily, the more advanced F-101B and F-106A aircraft, but still eminently usable for air defense purposes.[8]

(C)(Gp 4) When, in November 1964, Secretary of Defense Robert S. McNamara made the pronouncement that the regular interceptor force would be reduced to 20 squadrons in FY 1969, the importance of the ANG interceptor force immediately grew. At the apex of the growth of the regular interceptor force, in 1957, ADC controlled 69 squadrons. At the time of the McNamara announcement, that force stood at 42 squadrons, a slimming-down brought about by fiscal pressures that severely limited the number of advanced F-106 interceptors to be purchased.

(S)(Gp 4) At any rate, plans current at the end of 1965 outlined an ANG alert force of 21 squadrons, all to be

8. Msg, ADLPP 990, ADC to Air Div, 17 Mar 64 (Doc 8); Msg, ADOOP-P 1001, ADC to 30 AD, 17 Mar 64 (Doc 9); Hist of ADC, Jul-Dec 1965, p 70.

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eventually equipped with F-102A interceptors, all armed with nuclear weapons and all obligated to provide four aircraft on five- and fifteen-minute alert (an improvement over the 1961 requirement of two on five-minute alert and two on one-hour alert) at all times. This ADC/ANG force of 84 alert Century Series interceptors was planned to continue into the indefinite future as an increasingly larger proportion of air defense against the manned bomber.

~~(C)(Gp 4)~~ The main cloud on the ANG horizon (and it had hung there for several years) was the provision of nuclear storage facilities (and modern alert hangars) for the 21 ANG squadrons. Money, as usual, was the problem. In December 1965, OSD pared the NGB request for $24 million in the FY 1967 construction budget for nuclear storage and alert hangars to $9.4 million. This meant, for one thing, that only 10 of the 21 ANG squadrons would be provided with the necessary facilities for the storage of nuclear weapons.[9]

~~(C)(Gp 4)~~ Furthermore, OSD was studying the relative kill-probability of nuclear weapons as opposed to conventional armament. If this study indicated that the kill-probability of conventional weapons was anywhere near that of nuclear armament it was unlikely that OSD would ever approve the expenditure of any funds for additional nuclear

9. Msg, ADODC-A 4252, ADC to USAF, 13 Dec 65 (Doc 131 in Hist of ADC, Jan-Jun 1966).

storage capacity at ANG bases. In a counter-attack, ADC, in April 1966, issued a statement which claimed that failure to provide nuclear storage and alert hangars for the total ANG F-102A interceptor force would degrade ANG air defense capability anywhere from 6 to 30 percent, depending on the type of attack made on the United States.[10]

(C)(Gp-4) In the event that the protest against the reduction in ANG construction funds was unsuccessful, ADC began to prepare a fall-back position. A study of the possibility of moving ANG squadrons into bases recently vacated by regular ADC F-102 squadrons--Travis AFB, California, and Seymour Johnson AFB, North Carolina, came immediately to mind--was begun. Such bases were already equipped with nuclear storage facilities and alert hangars.[11]

(S)(Gp-4) The deployment of two F-102A squadrons to the Western Pacific in the spring of 1966, and the emergence of an ADC plan to sequester three F-102A squadrons into a Mobile Air Defense Package (MADPAC) for use in "brush fire" wars anywhere in the world, threatened to slow the pace of ANG conversion to the F-102A. Failure of OSD to approve

10. Msg, ADOOP-T 1494, ADC to USAF, 28 Apr 66 (Doc 134 in Hist of ADC, Jan-Jun 1966); Msg, ADLPP 1917, ADC to ADC Special Weapons Office (Kirtland), 7 Jun 66 (Doc 135 in Hist of ADC, Jan-Jun 1966); Wkly Acty Rprt, Plans, 5 Jan, 21 Feb and 27 May 1966 (ADC Documentary Hist No. 3).

11. Msg, ADLPP 792, ADC to USAF, 4 Mar 66 (Doc 132 in Hist of ADC, Jan-Jun 1966); Msg, ADLPP 883, ADC to TAC, 11 Mar 66 (Doc 133 in Hist of ADC, Jan-Jun 1966).

the MADPAC proposal, however, put the conversion plan back on the tracks again. By the middle of 1966 the 176th FIS at Madison (Truax Field), Wisconsin, had received more than half of its allotted 18 F-102A aircraft. Conversion dates for the other five squadrons still not equipped with the F-102 were established as follows:

178th FIS	Fargo (Hector Field), North Dakota	October 1966
186th FIS	Great Falls, Montana	December 1966
179th FIS	Duluth, Minnesota	February 1967
124th FIS	Des Moines, Iowa	April 1967
132nd FIS	Dow AFB, Maine	June 1967[12]

(S)(Gp-4) The question of atomic armament for the ANG was left hanging for the remainder of 1966. In the autumn, however, the Secretary of Defense did disapprove an NGB request for the additional active duty personnel needed to provide a nuclear capability for ANG squadrons. Nevertheless, ADC seized upon the word "additional" in the rejection and announced, in late November 1966, that it intended to proceed with the provision of nuclear armament to those 10 ANG squadrons which had access to adequate nuclear storage facilities. These, and the fiscal quarter in which they

12. Msg, ADODC 3381, ADC to NGB, 7 Oct 65 (Doc 136 in Hist of ADC, Jan-Jun 1966); Msg, ADOOP-P 1683, ADC to USAF, 13 May 66 (Doc 137 in Hist of ADC, Jan-Jun 1966); Msg, ADOTT-D 2152, ADC to 4756 AD Wg (Tyndall), 6 Jul 66 (Doc 138 in Hist of ADC, Jan-Jun 1966).

were to receive AIM-26A (the former GAR-11) missiles for their F-102A interceptors, were as follows:[13]

123rd FIS	Portland, Oregon	February 1967
116th FIS	Spokane, Washington	March 1967
134th FIS	Burlington, Vermont	March 1967
176th FIS	Truax Field, Wisconsin	March 1967
178th FIS	Hector Field, North Dakota	March 1967
186th FIS	Great Falls, Montana	April 1967
179th FIS	Duluth, Minnesota	April 1967
124th FIS	Des Moines, Iowa	February 1968
132nd FIS	Dow AFB, Maine	February 1968
182nd FIS	Kelly AFB, Texas	February 1968

(S)(Gp 4) Although the ANG stake in air defense was growing, there were always moves to have it do more. This time, the prime mover was Dr. Theodore C. Marrs, Deputy Secretary of the Air Force for Reserve and ROTC Affairs. Dr. Marrs asked USAF, in July 1966, to evaluate the possibility of shifting much of the responsibility for air defense to the ANG in order to free the regular forces for tactical and reconnaissance missions. This, it must be remembered, was at a time when the Air Force involvement in Southeast Asia was steadily increasing. The ADC reaction to this proposal, as it had been to earlier suggestions that

13. Msg, ADCCS 3511, ADC to USAF, 24 Nov 66 (Doc 272 in Hist of ADC, Jul-Dec 1966).

the ANG be provided BOMARC interceptor missiles, was decidedly negative. Where, Lt. Gen. Herbert B. Thatcher, ADC commander, wanted to know, was the ANG going to find the personnel to man squadrons at such locations as Minot, North Dakota; Glasgow, Montana; Klamath Falls, Oregon, and other isolated locations? In sum, General Thatcher wrote General John P. McConnell, USAF Chief of Staff, on 31 August 1966, the Marrs proposal "suggests ridiculous thinking and I would hope that the first team is at work countering the suggestion."[14] In a formal reply, ADC added that long experience with the ANG had shown continuing difficulty in recruiting people for specific jobs. Long after the ANG expected to provide full manning for the interceptor squadron at Portland, Oregon, for example, ADC found it necessary, for a while, to supply security guards. And what about Dispersed Operating Bases (DOB) that were even more isolated than many home bases? And what about Canadian DOBs in the event Canada should accede to the U. S. request for such sites? The list of similar questions was long.[15]

~~(S)(Gp 4)~~ As General Thatcher had hoped, the "first

14. Pers ltr, Lt. Gen. Herbert B. Thatcher, Cmdr, ADC to Gen. John P. McConnell, C/S, USAF, no subj, 31 Aug 66 (Doc 267 in Hist of ADC, Jul-Dec 1966).

15. Msg, ADLDC 2647, ADC to USAF, 30 Aug 66 (Doc 268 in Hist of ADC, Jul-Dec 1966).

team" was indeed at work on this matter. General McConnell, in a reply of 15 September 1966, outlined USAF reasoning:[16]

> It was evident from the study thus far conducted that ANG assumption of additional fighter interceptor missions would provide no manpower resources for the tactical forces or SEA in the near term and would have some serious long-term disadvantages. It appears that it would require a departure from the basic philosophy of the reserve forces.
>
> For these reasons, and because the study to date has provided sufficient basis for an evaluation of Dr. Marrs' proposal, further study is unnecessary. Certain of the data developed will be used in a reply to Dr. Marrs pointing out that ANG assumption of additional fighter interceptor missions does not appear feasible at this time.

No more was heard of this proposal.

(C)(Gp 4) The total equipage of the 21 ANG interceptor squadrons with F-102A aircraft was delayed in late 1966 when it was decided to provide two squadrons of F-102A interceptors to Greece and Turkey under the Military Assistance Program. This meant that the 124th at Des Moines and the 132nd at Dow would retain F-89J aircraft until FY 1969. Nevertheless, the 178th at Hector Field and the 186th at Great Falls got Century Series interceptors before the end of 1966 and the 179th at Duluth was so equipped in early 1967.[17]

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16. Pers ltr, McConnell to Thatcher, "ANG Replacing ADC Fighter Interceptor Units," 15 Sep 66 (Doc 269 in Hist of ADC, Jul-Dec 1966).

17. Msg, ADOOP-P 2695, ADC to NGB, 2 Sep 66 (Doc 262 in Hist of ADC, Jul-Dec 1966); Msg, ADOOP-P 2900, ADC to NGB, 27 Sep 66 (Doc 263 in Hist of ADC, Jul-Dec 1966); Msg,

(U) The increasing proportion of air defense capability being provided by the ANG was underlined on 2 February 1967 when Dr. Harold Brown, Secretary of the Air Force, told the Senate subcommittee on Defense appropriations that during the preceding year the ANG had provided 26 percent of air defense alert capability.[18]

~~(S)(Gp 1)~~ The anticipated OSD action as regards nuclear armament for ANG F-102A interceptors occurred in February 1967. On 6 March 1967 USAF made the decision known to ADC. No AIM-26A missiles were to be provided for ANG aircraft. Therefore, only the ANG squadrons at Des Moines and Dow AFB (F-89J aircraft) were provided with nuclear armament.[19]

~~(S)(Gp 4)~~ Although ADC had previously concluded that the non-nuclear AIM-26B was unsatisfactory for use with the F-102A, the denial of the atomic missile to the ANG touched off a renewal of interest in the AIM-26B. The possibility was thoroughly explored again, but ADC was once more forced to conclude that the AIM-26B was simply not feasible as armament for the F-102A. There were many reasons. When

17. (cont) AFOAP 93668, USAF to ADC, 30 Dec 66, as quoted in Msg ADLPP 6, ADC to Numbered Air Forces, 3 Jan 67 (Doc 264 in Hist of ADC, Jul-Dec 1966).

18. Hearing of the Senate Subcommittee on Department of Defense Appropriations for FY 1968, 2 Feb 1967, p 854.

19. Msg, AFOAPGB 90023, USAF to ADC, 6 Mar 67, as quoted in Msg ADOOP-P 637, ADC to Numbered Air Forces, 7 Mar 67 (Doc 230 in Hist of ADC, Jan-Jun 1967).

included in an armament load that also contained AIM-4A and AIM-4D (non-nuclear FALCON missiles), it was discovered that the AIM-26B could be fused during flight by the very presence of companion missiles. On the other hand, the AIM-26B was likely to provide an infra-red source that attracted companion missiles. In short, there was a good chance that the two types of missiles would destroy each other. Also, the fuse of the AIM-26B was found to be fatally deficient in that it (1) could be activated by ground radar clutter at low altitudes, (2) could be activated by chaff, because it operated independently of guidance information, and (3) performed erratically in tests. All thoughts of substituting the AIM-26B for the AIM-26A were therefore abandoned.[20]

~~(C)(Gp 1~~) From the very beginning of the ADC/ANG relationship, the rapidity of ANG reaction to air defense emergencies had been a matter of some concern to ADC. While the establishment of the ANG around-the-clock alert force had improved the day-to-day situation, the matter of utilization of complete squadrons was a matter of continuing discussion. One of the earliest attempts to insure prompt ANG reaction was the ADC publication of standing special orders which were continually held by ANG squadrons, but

20. Msg, ADODC 1091, ADC to 10 AF, 19 Apr 67 (Doc 232 in Hist of ADC, Jan-Jun 1967.

were not to be given effect until ADC notified the ANG unit of mobilization. At that moment, the ANG squadron was federalized and thereafter had the same status as regular Air Force squadrons.

~~(C)(Gp 1)~~ Even so, the federalization of ANG squadrons required Presidential or Congressional declaration of a national emergency or state of war and there could possibly be occasions when NORAD operational control of ANG units would be desirable prior to complete federalization. Solution of this problem required agreement between ADC and the states involved. All necessary agreements had been completed by early 1967 and it was possible to publish the procedures to be followed in such short-of-war situations. Upon NORAD declaration of DEFCON 2, the states agreed that NORAD could assume full operational control of ANG Air Defense Alert Detachments. These were the ANG people who normally stood air defense alerts, although they were under state control and only advised by ADC personnel. The number of ANG personnel in the various detachments varied from day to day and the number was controlled by the active duty orders published by the ADC advisory group attached to each ANG interceptor squadron. At NORAD declaration of DEFCON 1, the NORAD region commander was to so inform the Adjutants General of the states concerned and request that they ask the Governors to put into effect the agreements between ADC

and the individual states. Under this authority, NORAD was to be given operational control of the ANG squadron for a period not in excess of 15 days. If the period of emergency exceeded 15 days, further operational control of the squadron required complete federalization action. Through use of this method it was hoped NORAD would have effective operational control of ANG squadrons from the inception of the emergency until the federalization machinery was put into motion and complete federal control was established.[21] As of the spring of 1971 it had not been necessary to make use of this authority.

~~(S)(Gp-~~4) Despite the long partnership of ADC and the ANG, their exact relationship was regularly misunderstood, even within ADC. To counter such lower echelon misunderstanding, ADC found it necessary to explain, again and again, that while ANG interceptor squadrons were normally anxious to cooperate in such operations it was necessary to realize that ANG personnel were in reserve status (and under state control) and could not be directly ordered to do anything.[22]

~~(S)(Gp-~~3) Although the dispersal of regular ADC interceptor squadrons had been directed by OSD in the early sixties, it was not until 1967, when the ANG began to shoulder

21. Msg, NOOP-P X2-019, NORAD to JCS, 17 Feb 67 (Doc 234 in Hist of ADC, Jan-Jun 1967); Msg, ADODC-A 536, ADC to 14 AF, 23 Feb 67 (Doc 235 in Hist of ADC, Jan-Jun 1967.

22. Msg, ADODC 725, ADC to 14 AF, 15 Mar 67 (Doc 236 in Hist of ADC, Jan-Jun 1967).

an ever-larger proportionate share of the air defense mission, that the dispersal of ANG squadrons began to receive consideration. In this instance ADC took the initiative and began to solicit USAF support for ANG dispersal at DEFCON 1. The recommended ANG dispersal was vastly different from that involving regular ADC squadrons. ADC squadrons were directed to undertake the permanent dispersal of a portion of squadron strength, with dispersal bases permanently manned and equipped to service a major portion of the squadron in an emergency. It was not anticipated, however, that ANG squadrons would disperse until the emergency had arrived. ANG dispersal bases, therefore, were not to be manned and were to be equipped with only a minimum of supplies. The main purpose, in short, was to provide a place, other than the main base, where ANG interceptors might refuel and be "turned around" for reentry into the air battle. By early March of 1967 the ANG dispersal concept had been approved by USAF and the Secretary of the Air Force and submitted to OSD for decision. In the absence of concrete OSD disapproval, and using the authority provided by ADC responsibility under USAF and NORAD plans for Survival, Recovery and Reconstitution, ADC proceeded to survey the possibilities of ANG dispersal by asking the numbered air forces to suggest possible dispersal locations.[23]

23. Wkly Acty Rprt, ADOOP-P, 24 Feb and 6 Mar 1967 (ADC Documentary Hist No. 5).

~~(C)(Gp 4)~~ After evaluating the replies, ADC included a tentative list of ANG dispersal bases in the ADC Weapon Survival and Reconstitution plan of 15 June 1967. All 21 ADC/ANG interceptor squadrons, except the 157th at McEntire ANGB, South Carolina, were assigned a dispersal base. McEntire was considered relatively safe from attack and an alternate was not considered necessary. The first tentative listing is given in Table 6.

~~(S)(Gp 4)~~ Further study of ANG dispersal, however, revealed a number of other ANG squadrons, besides the 157th, that were sufficiently isolated from SAC bases and centers of population that they did not require dispersal bases. When the "tentative" list of ANG dispersal bases was again published in September 1967, seven other squadrons were removed from the list--those at Bradley Field, Burlington, Fresno, Boise, Des Moines, Sioux Falls and Fargo. There were also several changes in the locations of the dispersal bases of the 13 squadrons it was still believed needed to disperse. The September 1967 listing is shown in Table 7.

~~(S)(Gp 4)~~ Since the transfer of F-102 aircraft to Greece and Turkey was going to delay the equipment of the ANG squadrons at Des Moines and Dow, ADC produced an alternative proposal in the spring of 1967. Why not, General Thatcher wondered in April, equip these two squadrons with F-101B interceptors to be made available by the inactivation

of two ADC squadrons? Such conversions would be particularly trouble-free at these two locations, he reasoned, because both already had the nuclear storage facilities needed for the GENIE rocket used as armament not only by the F-89J aircraft they currently operated but also by the F-101B. Furthermore, both squadrons had good inspection records and both were adequately manned with experienced personnel. The ADC proposal received the blessing of USAF, but not that of OSD.[24] The ANG eventually received F-101B interceptors, but not nearly as soon as ADC proposed in April 1967.

~~(S)(Gp 3)~~ The feeling that the ANG should be contributing more to the defense of the nation, whether or not that feeling was fostered by the potilically potent Guard, continued to gnaw at USAF. It was regularly suggested that air defense was a particularly fruitful place for increased use of the ANG, because installations were fixed and it might well be possible for a reservist to sell shoes with one hand and help the air defense with the other. Over the years, it had been proposed that the ANG might operate BOMARC interceptor missiles, assume responsibility for ADC's

24. Msg, ADCCR 1080, ADC to USAF, 19 Apr 67 (Doc 239 in Hist of ADC, Jan-Jun 1967; Msg, ADLPP 1163, ADC to USAF, 26 Apr 67 (Doc 240 in Hist of ADC, Jan-Jun 1967); Air Defense Command Aerospace Objectives, 1967-1982, 30 Jun 1967, p A-1-10 (HO files).

Dispersed Operating Bases, provide airlift support for the regular forces, or support the B-57 force ADC used to evaluate the ground radar system. In every instance there had proved to be good reasons why the ANG could not be so used. In some cases the operating locations were so remote that sufficient ANG personnel could not be recruited. In other instances, ANG could not be provided with the required skills without a massive training effort. In still other cases, study indicated that it would cost as much to operate under ANG sponsorship as it would by continuing to use regular forces. Generally, too, ANG operation could not offer the flexibility required in an instant-reflex situation.

~~(S)(Gp-1)~~ Nevertheless, USAF commissioned the prestigious RAND Corporation, in the autumn of 1966, to undertake an in-depth study of the role of the ANG. Published in October 1967, the RAND study reviewed the earlier attempts to find a suitable additional mission for the ANG and, in the main, reached the same conclusions earlier studies had reached. In summary, RAND concluded that the ANG was a valuable supplement to ADC and recommended that (1) ANG interceptor squadrons be moved to more advantageous locations, generally oriented northward and closer to the borders of the country; (2) the two F-89J squadrons receive F-101B aircraft and other ANG squadrons be supplied with the F-101B as soon as

possible; (3) the Air Force work toward the day when the ANG could assume the entire peacetime identification mission, with the regular force of ADC F-12 interceptors furnishing the main air defense capability and surveillance of supersonic air traffic (the ANG receiving ever-more-modern interceptors--F-101B, F-106A and possibly F-4); (4) the ANG be given the mission of providing the routine and contingency airlift requirements of ADC. It added that there seemed to be no worthwhile reason for full-time ANG operation of present and projected atmospheric defense functions, since ANG people would merely replace personnel of the regular forces with no advantage in either cost or capability.[25]

~~(S)(Gp 1)~~ Although the RAND study was not formally published until October 1967, USAF asked ADC to comment on the proposed conclusions and recommendations in August 1967. ADC generally concurred with RAND, with some exceptions. ADC, of course, agreed that the two ANG squadrons with F-89J interceptors should receive the F-101B, having already made such a proposal, but warned against further improvement of the ANG force at the expense of regular F-101B units on the grounds that it would result in a degradation of the total interceptor force. It also warned that the general upgrading

25. R. J. Lew, The Air Reserve Forces Study, Vol VI: Continental Air Defense Forces (RAND Memo, RM-5331-PR, Santa Monica, 1967), pp 22-25 and 39-40.

of ANG units should not be undertaken until the regular force had definitely received advanced interceptors. ADC did not believe it would ever be desirable or feasible to turn over the entire peacetime identification function to the ANG.[26]

(S/NOFORN-EYCAN)(Gp 4) The campaign to obtain the F-101B for the ANG continued. Again in January of 1968, ADC requested that the 132nd FIS at Dow be supplied with this aircraft, but decision was deferred with the explanation that the whole ADC/ANG structure was under study. This study was completed at mid-year, but even more important was the economy-induced accelerated inactivation of seven ADC F-101B squadrons in 1968. This action produced a surplus of 163 F-101B interceptors. USAF proposed to convert 30 of these aircraft to reconnaissance configuration (RF-101) for use by TAC. It also proposed to allocate 66 of these aircraft to Canada to replace earlier-model F-101B aircraft previously supplied to the northern partner in NORAD. Such allocations left a residue of 67 aircraft for storage at Davis-Monthan AFB in Arizona. ADC recommended, in August 1968, that these relatively modern interceptors (plus some of those returned by Canada) be used to equip five ANG squadrons, specifically the 132nd at Dow, 179th at

26. Msg, ADLDC 2376, ADC to USAF, 22 Aug 67 (Doc 62 in Hist of ADC, Jul-Dec 1967).

Duluth, 116th at Spokane, 123rd at Portland and 186th at Great Falls.[27]

~~(S/NOFORN-EXCAN)(Gp-3)~~ The ADC recommendation was again disapproved by USAF, however. It was the USAF position that the surplus F-101Bs could best be used by ANG reconnaissance squadrons. Such a USAF request was subsequently forwarded to OSD, but denied. This denial gave ADC another opening and the request for the transfer of these aircraft to ADC/ANG units was revived in January 1969. But, as had happened so many times before, the request was not honored at USAF.[28]

~~(S)(Gp-3)~~ Finally, however, ADC desires in this regard were achieved. When the fiscal pressures generated by Project 703 (an Air Force program to reduce expenditures in FY 1970 by $3 billion) made it necessary for ADC to prepare for the inactivation of three of the six remaining F-101B squadrons in the regular interceptor force, ADC again recommended that the air defense capability of these aircraft be retained by giving them to the ANG. The major stumbling block to the approval of this request, USAF

27. Msg, ADODC 1734Z, ADC to USAF, 26 Jan 68 (Doc 103 in Hist of ADC, Jan-Jun 1968); Ltr, ADC to USAF, "ANG Conversion to F-101B Aircraft," 13 Aug 58 (Doc 124 in Hist of ADC, FY 1969).

28. Ltr, ADC to NGB, "Air National Guard Interceptor Forces," 22 Nov 68 (Doc 125 in Hist of ADC, FY 1969); Msg, ADOOP 1820Z, ADC to USAF, 16 Jan 69 (Doc 126 in Hist of ADC, FY 1969); Ltr, ADC to USAF, "ANG Conversion to F-101 Aircraft," 27 Jan 69 (Doc 127 in Hist of ADC, FY 1969); Msg, ADOOP-P 2250Z , ADC to USAF, 31 Jan 69 (Doc 128 in Hist of ADC, FY 1969).

revealed in September of 1969, was the provision to the ANG of the nuclear GENIE rocket carried by the F-101B. Although a dozen ANG squadrons had at one time been equipped with the F-89J interceptor and authorized to utilize the GENIE, many of these had been located on ADC bases that also supported regular ADC squadrons and where the stockpile of nuclear rockets could be closely controlled by USAF personnel. Separate ANG nuclear storage was provided at very few locations--Fargo and Des Moines, for example. A further complication was that USAF advisors were removed from ANG squadrons at about the same time because of the pressing need for pilots in Southeast Asia. Thus there was likely to be nobody at the ANG squadron who was authorized to have custody of the nuclear armament.[29]

~~(S)(Gp 3)~~ But ADC was tenacious and suggested at least a partial answer to the USAF dilemma. Nuclear storage igloos were available at DOW (132nd), Spokand (116th) and Fargo (178th), ADC explained in October 1969, so one hurdle could be jumped if the ANG F-101B squadrons were placed at these locations. Dow offered the fewest problems, since ADC had a DOB there and an earlier joint use agreement could easily be reestablished. At Fargo and Spokane the nuclear

29. Pers ltr, Lt. Gen. Lucius D. Clay, Jr., DCS/P&O, USAF, to Lt. Gen. Arthur C. Agan, Cmdr, ADC, no subj, 22 Sep 69 (Doc 139 in Hist of ADC, FY 1970).

storage areas had lain unused for several years, but ANG commanders at both locations were confident that the storage igloos could be refurbished and the necessary electronic security devices provided within six months of notice of conversion to the F-101B. As to the custody problem, ADC estimated that 18 USAF personnel would be required at each nuclear storage site. At the same time it was suggested that perhaps the change in the status of ANG civilian technicians from that of state employees to Federal employees (effective in January 1969) might make it possible to reduce or eliminate the requirement for regular USAF personnel. Also, on 17 October 1969, ADC requested that rated (flying) advisors be returned to ANG squadrons.[30]

(U) This time there was no objection from either USAF or OSD and the three ANG squadrons under consideration were approved for conversion to F-101B interceptors. All three stopped standing alert with F-102A aircraft between 10 November and 10 December 1969.[31]

(U) Neither was there any objection from higher authority when the last three ADC F-101B squadrons were inactivated

30. Pers ltr, Agan to Clay, 6 Oct 69 (Doc 140 in Hist of ADC, FY 1970); Ltr, ADC to USAF, "Return of Rated Advisors to Air National Guard Units," 17 Oct 69 (Doc 141 in Hist of ADC, FY 1970).

31. Msg, ADMME-AVDO 2040Z, ADC to NGB, 30 Oct 69 (Doc 142 in Hist of ADC, FY 1970); Msg, ADODC-A 2323Z, ADC to NORAD, 3 Nov 69 (Doc 143 in Hist of ADC, FY 1970); Msg, ADMSS-W 1836Z, ADC to SAAMA, 4 Nov 69 (Doc 144 in Hist of ADC, FY 1970).

and the aircraft passed along to ANG units in FY 1971. The ANG squadrons which benefitted from this action were the 123rd at Portland, Oregon, the 179th at Duluth and the 136th at Niagara Falls. The 136th gave up a TAC mission to resume an air defense mission. The 123rd began the conversion to the F-101B on 15 March 1971 and the other two squadrons were to begin conversion on 12 April 1971.[32]

~~(S)(Gp 1)~~ The mere assignment of F-101B aircraft to the ANG did not assure immediate air defense capability, however. The establishment of authority to store and handle nuclear weapons was probably the thorniest problem. Although USAF and OSD had approved the transfer of the first F-101B aircraft to the ANG in October 1969, as late as mid-September 1970 none of the first three squadrons so equipped had yet been supplied with GENIE rockets. At this time, however, ADC was hopeful that all three would soon be ready to undergo an Initial Capability Inspection (ICI), the first step along the road that led to authority to store nuclear weapons. It was anticipated that the 178th at Fargo would be ready for inspection before the end of September. The 132nd at Dow (which had recently become Bangor IAP) was expected to be ready in October, the 116th at Spokane in November. One source of delay was difficulty in getting the necessary approvals for nuclear safety rules as they applied to the ANG.[33]

32. Msg, DOTE 1700Z, ADC to Air Divs, 19 Mar 71 (Doc 10).
33. Msg, DMMM 1449Z, ADC to USAF, 16 Sep 70 (Doc 11).

[redacted]

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

DOE
(b)(3)

34. Initial Capability Inspection of the 119th Ftr Gp (ANG-Fargo), 9 Oct 1970 and 26 Mar 1971 (included in volume of inspection reports accompanying Hist of ADC, FY 1971); Msg, CS 2045Z, ADC to USAF, 20 Nov 70 (Doc 12); Msg, 24DM 1430Z, 24AD to ADC, 10 Dec 70 (Doc 13); Msg, SEGM 2230Z, ADC to 24AD, 3 Feb 71 (Doc 14).

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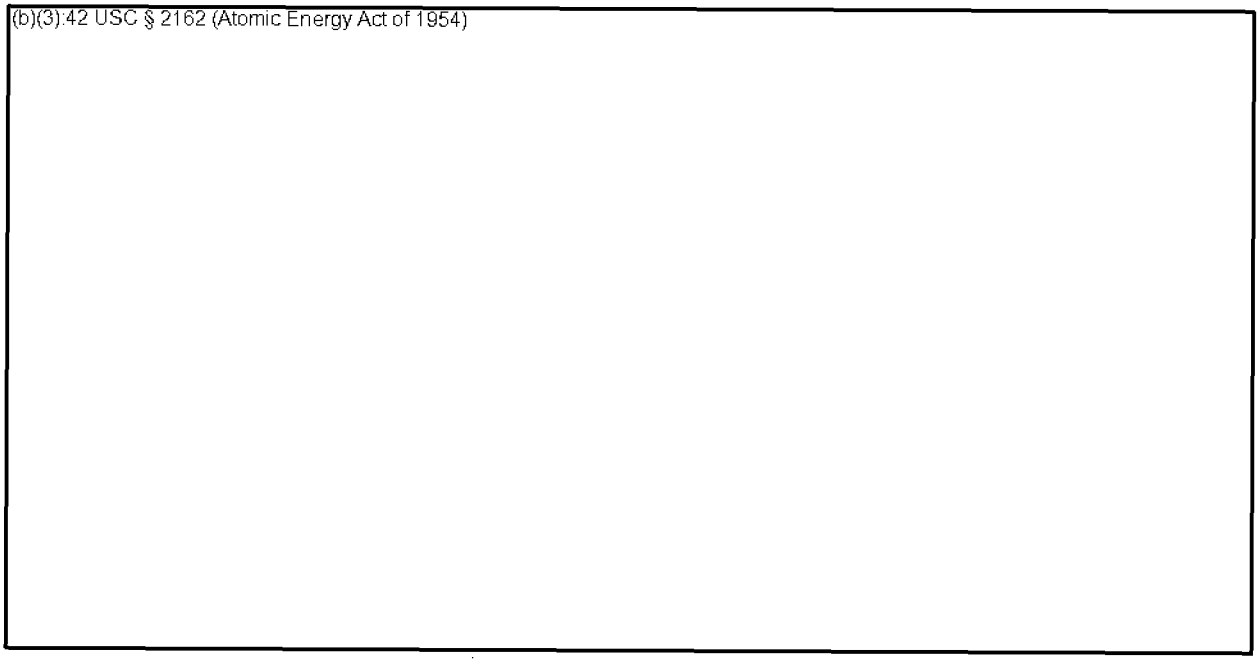

DOE (b)(3)

(S) (G) The matter of custody over the nuclear weapons required for ANG F-101B interceptors was also a problem not easily solved. There had been no such problem during the days when several ANG squadrons were equipped with the F-89J and armed with the GENIE rocket, because these squadrons were either located on the same base with a regular ADC squadron or were provided with an ADC advisor. In either event, ADC had direct control of the nuclear warheads. But senior ADC advisors had been removed from ANG squadrons when the war in Southeast Asia demanded the services of rated officers and none of the ANG squadrons proposed for conversion to the F-101B was located on the same base with an ADC squadron. OSD vetoed the idea of vesting custody in

35. Initial Capability Inspection of the 101st Ftr Gp (ANG-Bangor), 7 Nov 1970 and 141st Ftr Gp (ANG-Spokane), 29 Jan 1971 (included in volume of inspection reports accompanying Hist of ADC, FY 1971).

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ANG civilian technicians in January 1971. There was no other way, USAF concluded, but to furnish a force of active duty Air Force personnel to control nuclear weapons.[36]

~~(C)(Gp-4)~~ This proved to be difficult, because the nuclear stockpile agreement of 20 March 1967 between the Atomic Energy Commission (AEC) and the Department of Defense specified that the Munitions Accountable Supply Officer (MASO) having custody of AEC-produced material must bear either the AFSC 6425 (or be a non-commissioned officer with AFSC 645X0). The staff of the ADC advisor to ANG squadrons did not include such a person. ADC proposed to solve this riddle by having the ADC advisor appoint the ANG MASO, with the concurrence of the ANG commander, as the advisor's accountable agent. Detailed instructions as to the manner in which the air advisor would monitor all activities with respect to the GENIE were drawn up by ADC in April 1971, but final approval awaited formal concurrence of higher authority with the still-in-draft-form safety rules for ANG use of nuclear weapons in conjunction with the F-101B interceptor.[37]

36. Msg, DMMMN 2215Z, ADC to USAF, 17 Dec 70 (Doc 15); Msg, SSSMA 2107Z, USAF to ADC, 8 Jan 71 (Doc 16).

37. Msg, DMMM 1800Z, ADC to 24AD and 25AD, 31 Mar 71 (Doc 17); Msg, DMMM 2340Z, ADC to USAF, 2 Apr 71 (Doc 18); Msg, DMMM 2300Z, ADC to NGB, 15 Apr 71 (Doc 19); Msg, DMMM 1745Z, ADC to Air Divs, 16 Apr 71 (Doc 20).

(S)(Gp 4) Another of the innumerable attempts to give the ANG a still larger share of the responsibility for air defense came along in April of 1970 when USAF broached to ADC an OSD proposal to not only improve the capability of the ANG, but also reduce the total ADC/ANG interceptor force by eight squadrons. In detail, it was proposed that ADC transfer to ANG four F-106 squadrons and two F-101B squadrons while the ANG closed out eight F-102A squadrons. Over the years, the answers to such proposals had become almost routine. In this instance, ADC believed that the most important objection was that the loss of six regular and two ANG squadrons would spread the interceptor force much too thin. The predominance of ANG squadrons would reduce the ability of NORAD to react promptly to an attack since the existing agreements with the individual states precluded full mobilization of ANG squadrons prior to a declaration of DEFCON 1. Training would be much less thorough, because most ANG personnel were available only on weekends. The ANG, ADC added, would find it difficult to maintain Dispersed Operating Bases because most were remote from major cities, the major source of ANG personnel. The capacity of ADC to respond to overseas deployment requirements, such as COLLEGE CADENCE, would be greatly reduced. Speaking generally, ADC was convinced that the apparently widely held supposition that ANG squadrons were inherently less expensive to operate than equivalent regular units needed critical examination. ADC

was convinced that when an ANG unit was expected to perform the same functions as a regular unit the difference in cost was negligible. While ADC readily admitted that many ANG squadrons were highly competent, thoroughly trained and capable of high scores on Operational Readiness Inspections, the fact remained that many members of the ANG had divided loyalties.[38]

(S)(Gp-4) The position of the ANG was that the Air Force did not really accept the ANG as a full partner in the defense effort and that the reason was primarily one of money. At a meeting of the Executive Council of the National Guard Association of the United States on 9-10 November 1970 it was concluded that a massive effort was required to educate the Air Force and Congress as to the real capability of the ANG and convince both of the need to continue the ANG as a viable, combat-ready force. At any rate, the discussion that began in April of 1970 continued into November, but no concrete action, other than the transfer of three additional squadrons of F-101B aircraft to the ANG, was taken by the late spring of 1971.[39]

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38. Ltr, USAF to ADC, "Program Proposals for the Air Force Reserve and Air National Guard," 21 Apr 70 (Doc 157 in Hist of ADC, FY 1970); Ltr, ADC to USAF, "Program Proposals for the Air Force Reserve and Air National Guard," 29 Apr 70 (Doc 158 in Hist of ADC, FY 1970).

39. Ltr, ADC to USAF, "Support for Guard and Reserve Forces," 27 Oct 70 (Doc 21); ADC, "Talking Paper" on "Air National Guard Assumption of the Air Defense Mission," 11 Nov 70 (Doc 22); The National Guardsman, Dec 1970, pp 16-17.

(U) Nevertheless, there did prove to be another function closely related to air defense where the ANG could provide assistance. Air-to-air refueling was that area. From the days of the initial COLLEGE CADENCE deployments to Korea, ADC F-106A interceptors in increasing numbers were equipped for air-to-air refueling. By 1970 all such ADC F-106s had been so equipped. This capability placed an added burden on SAC KC-135 fuel tankers, however, as increasing numbers of ADC aircraft required that this capability be periodically exercised. Enter the ANG, which had earlier-model KC-97 tankers released by SAC when it was supplied with the more modern KC-135. The possibilities were raised with NGB in May of 1970 and the NGB response was favorable. In July 1970, therefore, ADC requested that the 136th Air Refueling Wing (Dallas) support the deployment of F-106s from Kingsley Field, Oregon, to Tyndall AFB, Florida, in August. This deployment was accomplished, but when ADC proposed further F-106/KC-97 continuation training, beginning in October 1970, USAF balked on the grounds that it did not have sufficient funds to finance the active duty pay of the necessary ANG personnel. This difficulty was overcome in early 1971, however, and regular ADC/ANG refueling training began.[40]

40. Msg, DO 2129Z, ADC to NGB, 17 Jul 70 (Doc 23); Msg, DOTW 1754Z, ADC to 25AD, 2 Oct 70 (Doc 24); Msg, DO 1330Z, ADC to USAF, 21 Oct 79 (Doc 25); Msg, DO 1406Z, ADC

(U) A new type of summer encampment was inaugurated by the ANG in August 1968 when the 196th FIS (Ontario) flew F-102 aircraft to Alaska for two weeks of intensive flying and concentrated air defense training. This experiment was so successful that two more ANG F-102 squadrons (the 123rd at Portland and the 178th at Fargo) similarly deployed in August of 1969. Fund shortages, however, prevented a similar COOL RIDE deployment in 1970.[41]

(U) With the continuing diminution of the training capacity of ADC, the ANG also found it necessary to assume another new role. The 111th FIS (147th Fighter Group) at Ellington AFB was reorganized as an F-102 Combat Crew Training School (CCTS) on 1 January 1970, although it continued to hold a combat mission (see below). There were several good reasons for the selection of Houston as the CCTS site. The 111th had a good, long record of operations with the F-102 and was well supplied with experienced F-102 pilots. Also, the weather was excellent for training. Besides, the 111th was being forced out of the active air defense business because the ADC radar site utilized by the 111th for ground-controlled interception was inactivated. The

40. (cont) to Air Divs, 22 Dec 70 (Doc 26); Msg, DOT 2256Z, ADC to NGB, 8 Jan 71 (Doc 27).

41. Msg, ADODC 0131Z, ADC to NGB, 31 Jul 68 (Doc 137 in Hist of ADC, FY 1969); Msg, ADODC 2355Z, ADC to TAG (California), 1 Aug 68 (Doc 138 in Hist of ADC, FY 1969); Interceptor, Feb 1969, pp 5-7; Activity Report, DCS/O, ADC, 5, 18 and 30 Aug 1969 (Sup Doc Vol I in Hist of ADC, FY 1970).

radar of the inactivated ADC 747th AC&W Squadron at Ellington, however, were absorbed by the 147th Fighter Group (parent of the 111th FIS) and the radar was used in the training of ANG F-102 and F-101B aircrews. The training offered at Ellington was therefore comparable to that previously given by ADC at Perrin (F-102) and Tyndall (F-101B). The ANG CCTS began operations in March of 1970 and produced 16 combat-ready F-102 pilots during the first eight months of operations. When the last three ADC F-101B squadrons were inactivated in the spring of 1971, the ANG CCTS at Ellington also assumed the responsibility for the training of F101B aircrews. This shift of the F-102/F-101B training mission to the ANG also produced a reversed situation in which ADC found it necessary to ask the ANG for the training quotas needed to produce the F-102 and F-101B pilots required by ADC. The regular 57th FIS in Iceland was still equipped with F-102 aircraft, so, in April 1971, ADC requested that the ANG train 12 ADC F-102 pilots in FY 1972 for use as replacements for the 57th and for use as ADC advisors to ANG squadrons. It also asked that the ANG train six ADC F-101B crews in FY 1973 for advisor duty.[42]

(~~S/NOFORN-EYES ONLY~~)(Gp-3) Despite the conversion of the Houston ANG squadron to a peacetime CCTS function, there were still plans to put it to combat use in an emergency.

42. Hist of ADC, FY 1970, p 121; "Houston Guard Goes CCT," Interceptor, Nov 1970, pp 16-19; Msg, DO 2315Z, ADC

This concept resulted in the COLLEGE TANG operations plan, initially published on 1 July 1970. Early thinking on this matter suggested that the unarmed CCTS aircraft be deployed, in flights of four, to such ANG bases as McEntire, Jacksonville, and Pittsburgh as well as to such ANG dispersal sites as Mansfield, Ohio, and Savannah, Georgia. It was anticipated that the necessary armament would be pre-positioned at COLLEGE TANG deployment sites. The published plan, however, contained several options, any one of which could be chosen by NORAD at DEFCON 3 or higher states of readiness. The Houston interceptors, according to the formal plan, were to be fully armed with conventional weapons prior to departure from Ellington. Under the first option (Alpha), the Houston interceptors were to deploy, as a unit, to any one of 11 ADC interceptor bases vacated by an ADC squadron temporarily serving outside the continental United States. Option Bravo would send the COLLEGE TANG aircraft, as a unit, to Elmendorf AFB (Alaska), Kincheloe AFB (Michigan), Moose Jaw (Saskatchewan), or North Bay (Ontario). Option Charlie called for the deployment of four armed F-102 interceptors from Houston to Grant County Airport (Washington), Austin-Straubel MAP (Wisconsin), Mansfield, Bradley Field

42. (cont) to NGB, 23 Apr 71 (Doc 28).

(Connecticut) and Savannah. The plan was amended on 25 August 1970 to remove Moose Jaw and North Bay from Option Bravo.[43]

(S/NOFORN-EYCAN)(Gp-3) The loss of the ADC F-101B squadron at K. I. Sawyer AFB, Michigan, in the spring of 1971 caused some second thoughts about the use of COLLEGE TANG, however. While an F-106 squadron was to be moved from Duluth to K. I. Sawyer, the F-106 did not have the range of the F-101B, thereby creating what NORAD considered a dangerous gap in interceptor coverage between the Canadian CF-101B base at Val D'Or, Quebec, and K. I. Sawyer. NORAD suggested to Canadian officials that COLLEGE TANG might be used to fill this gap in an emergency and generally augment the interceptor strength available to the 22nd NORAD Region. The Canadians expressed interest in this proposal, but there had been no formal change in COLLEGE TANG deployment at the end of April 1971.[44]

(S/NOFORN-EYCAN)(Gp-3) Continuing study of the dispersal of ANG squadrons revealed a dwindling need. When the original listing of ANG dispersal bases was made in June of 1967,

43. Msg, ADODC 2143Z, ADC to USAF, 7 Nov 69 (Doc 153 in Hist of ADC, FY 1970); Msg, ADODC 1935Z, ADC to USAF, 18 Dec 69 (Doc 154 in Hist of ADC, FY 1970); ADC OPLAN 24-70, COLLEGE TANG, 1 Jul 70 (HO files); Change 1 to ADC OPLAN 24-70, COLLEGE TANG, 25 Aug 70 (HO files); Msg, DOT 1910, ADC to NGB, 28 Jul 70 (Doc 29); Msg DOT 1400Z, ADC to AAC, 13 Oct 70 (Doc 30).

44. Msg, DO 1909Z, ADC to USAF, 28 Apr 71 (Doc 31).

dispersal sites numbered 20. By September 1967 the list had decreased to 13. In April of 1968 the number was further decreased to six and stood at that point in the spring of 1971. There were, however, some changes in the designation of the ANG squadrons expected to disperse. The April 1968 group included the 116th (Spokane to Grant County Airport), 123rd (Portland to Grant County Airport), 146th (Pittsburgh to Mansfield, Ohio), 159th (Jacksonville to McEntire ANGB, South Carolina), 179th (Duluth) to Austin-Straubel Airport, Wisconsin) and the 186th (Great Falls to Logan Field, Montana). At the end of FY 1970, the 116th was no longer included in the list, but the 122nd (New Orleans to Gulfport, Mississippi), and 196th (Ontario to Edwards AFB) had been added, while the dispersal base for the 159th had been changed from McEntire to Savannah. When the 122nd was removed from the air defense network in December 1970, the number of ANG squadrons expected to disperse was again back to six.[45]

(S/NOFORN EXCAN)(Gp 4) The same economic factors which dictated a severe reduction in the regular ADC interceptor force also encompassed the ANG, although there was a

45. Change 4 to ADC OPLAN 300-67, "Weapons Survival and Reconstitution," 11 Apr 68 (Doc 120 in Hist of ADC, Jan-Jun 1968); Msg, ADOOP 2329Z, ADC to 4AF, 20 May 68 (Doc 124 in Hist of ADC, Jan-Jun 1968), Msg, ADOOP-P 1458Z, ADC to SAC, 5 Jun 68 (Doc 125 in Hist of ADC, Jan-Jun 1968); ADC OPLAN 300-70, "Weapons Survival and Reconstitution," 1 Jan 70 (Doc 172 in Hist of ADC, FY 1970).

significant difference in the manner in which the reductions were applied to the ANG interceptor force. ADC was instructed, in 1967, to plan a decrease in the ANG force by eight squadrons--from 21 to 13--in FY 1970. Six of these (111th at Ellington, 122nd at New Orleans, 152nd at Tucson, 175th at Sioux Falls, 182nd at Kelly AFB and 196th at Ontario) were selected for discontinuance because associated long-range radars were to be closed. The loss of the 118th at Bradley Field (Connecticut) was to occur because of simple redundance in the northeastern United States. The 124th at Des Moines was included because there was no satisfactory aircraft available to replace the obsolescent F-89J. Then, in mid-1968, came an OSD proposal to save even more money by accomplishing these reductions during FY 1969.[46]

(S/NOFORN-EXCAT)(Gp 4) The ANG, however, enjoyed the sort of "grass roots" political support that ADC did not command, so ANG units were not slashed as drastically as had been planned. Only two ANG squadrons left the ADC stable in FY 1969 and these were given TAC missions. The 152nd at Tucson ceased standing air defense alert on 1 May 1969, with the 124th at Des Moines following the same path on 15 May. Plans in effect at the end of FY 1969, though,

46. Msg, ADODC I734Z, ADC to USAF, 26 Jan 68 (Doc 103 in Hist of ADC, Jan-Jun 1968); Bureau of the Budget Brief on Project 693, "Air Defense," 7 Jun 68 (Doc 104 in Hist of ADC, Jan-Jun 1968); Msg, ADLAD-W 2302Z, ADC to ESD, 3 Jul 68 (Doc 105 in Hist of ADC, Jan-Jun 1968).

still outlined a massive loss of ANG support for ADC. Scheduled to go in FY 1970 were the 182nd (Kelly) and 175th (Sioux Falls). Four more were to leave in FY 1971--the 118th (Bradley), 122nd (New Orleans), 111th (Ellington), and 196th (Ontario). Three years later, in FY 1974, five others were to go--the 190th (Boise), 194th (Fresno), 146th (Pittsburgh), 157th (McEntire), and 176th (Truax)--leaving the ADC/ANG interceptor force at eight squadrons at the end of FY 1974.[47]

~~(S)(Gp-4)~~ Attrition was somewhat faster than planned in FY 1970. While the 111th Ellington was not totally lost, it assumed a CCTS mission in January 1970 and could no longer be considered actively alert. The training it conducted was directed by ADC's Air Defense Weapons Center (Tyndall), however, and it was obligated to fulfill COLLEGE TANG requirements when directed by NORAD. The other two squadrons earmarked for loss--the 175th at Sioux Falls and the 182nd at Kelly AFB--were duly lost in May of 1970.[48]

47. Change 2 to ADC Programming Document 71-1, 1 Jul 69 (HO files); Msg, ADLPP 2202Z, ADC to CONAD, 27 Feb 69 (Doc 130 in Hist of ADC, FY 1969); Msg, ADOOP-E 1535Z, ADC to ADC Computer and Systems Training Office (Santa Monica), 2 Jun 69 (Doc 131 in Hist of ADC, FY 1969); Msg, ADLPP 2150Z, ADC to Numbered Air Forces, 1 Apr 69 (Doc 132 in Hist of ADC, FY 1969); ADC Programmed Action Directive 69-8, 20 Apr 69 (Doc 133 in Hist of ADC, FY 1969).

48. Hist of ADC, FY 1970, pp 126-128.

(S)(Gp-4) Meanwhile, as might have been anticipated, the plan to reduce the number of ADC/ANG squadrons to eight at the end of FY 1974 was dropped. The program in effect at the end of FY 1970 called for the loss of only two more ANG squadrons by the end of FY 1975--the 118th at Bradley and the 196th at Ontario were scheduled to leave during FY 1972.[49]

(S)(Gp-4) Things did not work out quite that way, however. An ADC proposal to move the 122nd from New Orleans to some location further north (Selfridge AFB, Michigan, was suggested) was disapproved at USAF, so the 122nd was phased out of the ANG interceptor force in December 1970. There was really no alternative, since there was no longer an ADC radar in the New Orleans area. ADC also sought to retain the 118th at Bradley in place of the 134th at Burlington, but this request was also denied. Then, unusually enough, ADC gained an ANG squadron when it was decided that the aircraft of the last three F-101B squadrons in ADC would be transferred to the ANG. Therefore, while the 118th at Bradley left the interceptor force before the end of FY 1971, ADC gained the 136th at Niagara Falls, one of the ANG squadrons designated to receive the F-101B. Thus, at least temporarily, it was settled that ADC would have cognizance

49. Ltr, ADC to NGB, "ANG F-102 Unit Structure," 12 Jun 70 (Doc 159 in Hist of ADC, FY 1970); ADC Program Document 72-1, 15 Apr 70 (HO files).

over 16 ANG units through FY 1976. Six squadrons were equipped with the F-101B. The other nine were expected to make-do with the aging F-102. The ANG squadrons involved are given in Table 8.[50]

(U) For a quarter of a century, as of 1971, ADC and the ANG had been jointly involved in an enterprise dedicated to air defense against the manned bomber. The relationship was sometimes warm, sometimes cool, but the union continued. The ANG began operations with F-47 and F-51 fighters left over from World War II. In 1971 it was equipped with F-101B and F-102A jet interceptors, the best, aside from the F-106A, the United States had to offer. At one time during this period, 70 ANG squadrons were committed to air defense. In 1971 the number had shrunk to 15. For most of these 25 years the ANG was vastly overshadowed by the professional ADC force in terms of advanced aircraft and trained personnel. But as national military priorities forced a great reduction in the professional force, the importance of the relative ANG contribution grew, until in 1971 the ANG interceptor force overshadowed the professional force in terms of

50. Ltr, ADC to NGB, "ANG F-102 Unit Structure," 4 Aug 70 (Doc 32); Pers ltr, Maj. Gen. Arthur G. Salisbury, C/S, ADC to Lt. Gen. George S. Boylan, Jr., DCS/Programs and Resources, USAF, no subj, 27 Nov 70 (Doc 33); Msg, PRPO 2207Z, USAF to ADC, 17 Dec 70 (Doc 34); Msg, DO 2020Z, ADC to USAF, 21 Dec 70 (Doc 35); Msg, PR 2226Z, USAF to ADC, 22 Dec 70 (Doc 36); Msg, XP 1520Z, TAC to USAF, 24 Dec 70 (Doc 37); ADC Program Document 73-1, 1 Apr 71 (HO files).

aircraft (16 squadrons for ANG as opposed to 12 squadrons for ADC). Never, however, was the wariness of the gifted amateur toward the professional totally overcome. ANG personnel seemed to be haunted by the notion that every time a professional Air Force pilot looked at an ANG pilot he saw, despite the flying clothing, a shoe clerk or real estate salesman in disguise. These apprehensions were perhaps true to some extent, but the ADC/ANG partnership was believed imperative by the makers of national military policy and was likely to continue indefinitely.

APPENDIX

TABLE 1

RELEASED AIR NATIONAL GUARD SQUADRONS
November-December 1952

Released ANG Squadron	Base	New ADC Squadron	Aircraft
105	McGhee-Tyson Airport, Tennessee	469	F-47
109	Wold-Chamberlain Field, Minnesota	18	F-51
113	Scott AFB, Illinois	85	F-51
118	Suffolk County AFB, New York	45	F-47
121	Andrews AFB, Maryland	95	F-94A
123	Portland IAP, Oregon	357	F-86A
126	Truax Field, Wisconsin	432	F-86A
132	Dow AFB, Maine	49	F-80
133	Grenier AFB, New Hampshire (re-sited to Langley AFB, Virginia)	48	F-47
134	Burlington Airport, Vermont	37	F-51
136	Niagara Falls Airport, New York	47	F-47
142	New Castle County Airport, Delaware	96	F-94A
148	Dover AFB, Delaware	46	F-94A
163	Sioux City Airport, Iowa	87	F-51
166	Lockbourne AFB, Ohio (re-sited to Youngstown Airport, Ohio)	86	F-84A
172	Selfridge AFB, Michigan	56	F-51
175	Ellsworth AFB, South Dakota	54	F-51
176	Truax Field, Wisconsin	433	F-89B
179	Duluth IAP, Minnesota	11	F-51
188	Long Beach Airport, California (re-sited to Oxnard AFB, California)	354	F-51

Source: Hist of ADC, Jul-Dec 1952, p 31 and map following p 40.

TABLE 2

AIR NATIONAL GUARD SQUADRONS ASSIGNED TO
AIR DEFENSE COMMAND
November 1953

Fighter-Interceptor Squadrons

Squadron	Location
101	Boston, Massachusetts
109	St. Paul, Minnesota
116	Spokane, Washington
123	Portland, Oregon
126	Milwaukee, Wisconsin
131	Westfield, Massachusetts
132	Bangor, Maine
133	Manchester, New Hampshire
134	Burlington, Vermont
136	Niagara Falls, New York
137	White Plains, New York
138	Syracuse, New York
139	Schenectady, New York
175	Sioux Falls, South Dakota
176	Madison, Wisconsin
179	Duluth, Minnesota
186	Great Falls, Montana
190	Boise, Idaho

Fighter-Bomber Squadrons

1	Fort Dix, New Jersey
7	Philadelphia, Pennsylvania
103	Philadelphia, Pennsylvania
104	Baltimore, Maryland
107	Detroit, Michigan
108	Chicago, Illinois
111	Houston, Texas
112	Canton, Ohio
113	Indianapolis, Indiana
115	Van Nuys, California
118	Windsor Locks, Connecticut
119	Newark, New Jersey
120	Denver, Colorado
121	Andrews AFB, Maryland
124	Des Moines, Iowa

Table 2 (cont)

Squadron	Location
125	Tulsa, Oklahoma
127	Wichita, Kansas
128	Marietta, Georgia
142	Wilmington, Delaware
146	Coraopolis, Pennsylvania
147	Coraopolis, Pennsylvania
148	Reading, Pennsylvania
152	Providence, Rhode Island
156	Charlotte, North Carolina
157	Eastover, South Carolina
158	Savannah, Georgia
159	Jacksonville, Florida
162	Dayton, Ohio
163	Fort Wayne, Indiana
164	Mansfield, Ohio
165	Louisville, Kentucky
166	Columbus, Ohio
167	Charleston, West Virginia
168	Chicago, Illinois
169	Peoria, Illinois
170	Springfield, Illinois
171	Detroit, Michigan
172	Battle Creek, Michigan
173	Lincoln, Nebraska
174	Sergeant Bluffs, Iowa
181	Dallas, Texas
182	San Antonio, Texas
185	Oklahoma City, Oklahoma
187	Cheyenne, Wyoming
188	Albuquerque, New Mexico
191	Salt Lake City, Utah
192	Reno, Nevada
194	Hayward, California
195	Van Nuys, California
196	Ontario, California
197	Phoenix, Arizona

Source: USAF "Programmed Assignment of Aircraft to the Air National Guard," 12 Nov 1953 (App 9 in ADC Hist Study No. 5).

TABLE 3

PROPOSED CHANGES IN THE AIR NATIONAL GUARD
INTERCEPTOR FORCE
April 1957

USAF Recommendation			ADC Recommendation	
Priority	Sq	Location	Sq	Location
1	111	Houston, TX	111	Houston, TX
2	182	San Antonio, TX	182	San Antonio, TX
3	181	Dallas, TX	181	Dallas, TX
4	125	Tulsa, OK	125	Tulsa, OK
5	185	Oklahoma City, OK	185	Oklahoma City, OK
6	117	Hutchinson, KS	188	Albuquerque, NM
7	173	Lincoln, NE	127	Wichita, KS
8	175	Sioux Falls, SD	122	New Orleans, LA
9	178	Fargo, ND	159	Jacksonville, FL
10	188	Albuquerque, NM	158	Savannah, GA
11	120	Denver, CO	128	Marietta, GA
12	187	Cheyenne, WY	173	Lincoln, NE
13	186	Great Falls, MT	124	Des Moines, IA
14	190	Boise, ID	175	Sioux Falls, SD
15	116	Spokane, WA	178	Fargo, ND
16	123	Portland, OR	179	Duluth, MN
17	192	Reno, NV	120	Denver, CO
18	194	Fresno, CA	187	Cheyenne, WY
19	191	Salt Lake City, UT	186	Great Falls, MT
20	115	Van Nuys, CA	116	Spokane, WA
21	152	Tucson, AZ	197	Phoenix, AZ
22	197	Phoenix, AZ	152	Tucson, AZ
23	122	New Orleans	123	Portland, OR
24	159	Jacksonville, FL	192	Reno, NV
25	158	Savannah, GA	194	Fresno, CA
26	128	Marietta, GA	115	Van Nuys, CA
27	157	Eastover, SC	157	Eastover, SC
28	156	Charlotte, NC	156	Charlotte, NC
29	179	Duluth, MN	190	Boise, ID
30	124	Des Moines, IA	191	Salt Lake City, UT

Source: Msg, AFOOP-OC 54573, USAF to ADC, 8 Apr 57 (Doc 320 in Hist of ADC, Jan-Jun 1957); Msg, ADOOP-B 1064, ADC to USAF, 17 Apr 57 (Doc 321 in Hist of ADC, Jan-Jun 1957).

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TABLE 4

AIR NATIONAL GUARD INTERCEPTOR FORCE
31 December 1957

Squadron	Location
101	Boston, Massachusetts
102	New York NAS, New York
103	Philadelphia, Pennsylvania
104	Baltimore, Maryland
108	Chicago, Illinois
109	St. Paul, Minnesota
111	Ellington AFB, Texas
115	Van Nuys, California
116	Spokane, Washington
118	Windsor Locks, Connecticut
120	Denver, Colorado
121	Andrews AFB, Maryland
122	New Orleans, Louisiana
123	Portland, Oregon
124	Des Moines, Iowa
125	Tulsa, Oklahoma
126	Milwaukee, Wisconsin
127	McConnell AFB, Kansas
128	Dobbins AFB, Georgia
131	Westfield, Massachusetts
132	Bangor, Maine
133	Grenier AFB, New Hampshire
134	Burlington, Vermont
136	Niagara Falls, New York
137	White Plains, New York
138	Syracuse, New York
139	Schenectady, New York
142	Wilmington, Delaware
146	Pittsburgh, Pennsylvania
147	Pittsburgh, Pennsylvania
151	Knoxville, Tennessee
152	Tucson, Arizona
156	Charlotte, North Carolina
157	Eastover, South Carolina
158	Savannah, Georgia
159	Jacksonville, Florida
167	Martinsburgh, West Virginia
173	Lincoln, Nebraska
175	Sioux Falls, South Dakota
176	Madison, Wisconsin

Table 4 (cont)

Squadron	Location
178	Fargo, North Dakota
179	Duluth, Minnesota
181	Dallas, Texas
182	Kelly AFB, Texas
185	Oklahoma City, Oklahoma
186	Great Falls, Montana
187	Cheyenne, Wyoming
188	Kirtland AFB, New Mexico
190	Boise, Idaho
191	Salt Lake City, Utah
192	Reno, Nevada
194	Fresno, California
196	Ontario, California
197	Phoenix, Arizona
198	Puerto Rico

Source: Msg, ADOOP-P 102, ADC to USAF, 12 Sep 57 (Doc 288 in Hist of ADC, Jul-Dec 1957); Hist of ADC, Jul-Dec 1957, pp 122-123.

TABLE 5

AIR NATIONAL GUARD AROUND-THE-CLOCK ALERT FORCE
1 July 1961

Squadron	Location	Aircraft
111	Ellington AFB, Texas	F-102A
116	Spokane IAP, Washington	F-89J
118	Bradley Field, Connecticut	F-100A
122	New Orleans NAS, Louisiana	F-102A
123	Portland IAP, Oregon	F-89J
124	Des Moines MAP, Iowa	F-86L
132	Dow AFB, Maine	F-89J
134	Burlington AFB, Vermont	F-89J
146	Greater Pittsburgh MAP, Pennsylvania	F-102A
151	McGhee-Tyson Airport, Tennessee	F-104A
152	Tucson MAP, Arizona	F-100A
157	Congaree AFB, Eastover, South Carolina	F-104A
159	Imeson Field, Jacksonville, Florida	F-102A
173	Lincoln AFB, Nebraska	F-86L
175	Joe Foss Field, Sioux Falls, South Dakota	F-102A
176	Truax Field, Madison, Wisconsin	F-89J
178	Hector Field, Fargo, North Dakota	F-89J
179	Duluth IAP, Minnesota	F-89J
182	Kelly AFB, Texas	F-102A
186	Great Falls MAP, Montana	F-89J
188	Kirtland AFB, New Mexico	F-100A
190	Boise MAP, Idaho	F-86L
194	Fresno MAP, California	F-86L
196	Ontario IAP, California	F-86L
197	Sky Harbor, Phoenix, Arizona	F-104A

Source: Hist of ADC, Jan-Jun 1961, pp 178-180.

TABLE 6

AIR NATIONAL GUARD DISPERSAL
June 1967

Sq	Home Base	Dispersal Base
111	Ellington AFB, Texas	England AFB, Louisiana
116	Spokane, Washington	Larson AFB, Washington
118	Bradley Field, Connecticut	Worcester MAP, Massachusetts
122	New Orleans, Louisiana	Gulfport MAP, Mississippi
123	Portland, Oregon	Larson AFB, Washington
124	Des Moines, Iowa	Cedar Rapids MAP, Iowa
132	Dow AFB, Maine	Brunswick NAS, Maine
134	Burlington MAP, Vermont	Schenectady MAP, New York
146	Pittsburgh, Pennsylvania	Mansfield MAP, Ohio
152	Tucson, Arizona	Gila Bend, Arizona
159	Jacksonville, Florida	Glynco NAS, Florida
175	Joe Foss Field, South Dakota	Watertown MAP, South Dakota
176	Truax Field, Wisconsin	Green Bay MAP, Wisconsin
178	Hector Field, North Dakota	Portage la Prairie, Canada
179	Duluth IAP, Minnesota	Green Bay MAP, Wisconsin
182	Kelly AFB, Texas	Chase NAS, Texas
186	Great Falls, Montana	Moose Jaw, Canada
190	Boise, Idaho	Mountain Home AFB, Idaho
194	Fresno, California	Edwards AFB, California
196	Ontario, California	Oxnard AFB, California

Source: Tab A to Appendix 5 to Annex B, ADC OPLAN 300-67, "Weapons Survival and Reconstitution," 15 Jun 1967 (Doc 233 in Hist of ADC, Jan-Jun 1967).

TABLE 7

AIR NATIONAL GUARD DISPERSAL
September 1967

Sq	Home Base	Dispersal Base
111	Ellington AFB, Texas	England AFB, Louisiana
116	Spokane, Washington	Grant County Aprt, Washington
122	New Orleans, Louisiana	Gulfport MAP, Mississippi
123	Portland, Oregon	Grant County Aprt, Washington
132	Dow AFB, Maine	Burlington, Vermont
146	Pittsburgh, Pennsylvania	Mansfield MAP, Ohio
152	Tucson, Arizona	Gila Bend, Arizona
159	Jacksonville, Florida	McEntire ANGB, South Carolina
176	Truax Field, Wisconsin	Austin-Straubel Field, Wisconsin
179	Duluth, Minnesota	Austin-Straubel Field, Wisconsin
182	Kelly AFB, Texas	Webb AFB, Texas
186	Great Falls, Montana	Logan Field, Montana
196	Ontario, California	Edwards AFB, California

Source: Change 1 to ADC OPLAN 300-67, "Weapons Survival and Reconstitution," 15 Sep 1967 (Doc 64 in Hist of ADC, Jul-Dec 1967).

TABLE 8

AIR NATIONAL GUARD SQUADRONS ASSIGNED TO THE AEROSPACE DEFENSE COMMAND AFTER FISCAL YEAR 1971

Squadron	Location	Aircraft
116	Spokane IAP, Washington	F-101B
123	Portland IAP, Oregon	F-101B
132	Bangor IAP, Maine	F-101B
134	Burlington IAP, Vermont	F-102A
136	Niagara Falls IAP, New York	F-101B
146	Greater Pittsburgh Aprt, Pennsylvania	F-102A
157	McEntire ANGB, South Carolina	F-102A
159	Jacksonville IAP, Florida	F-102A
176	Truax Field, Wisconsin	F-102A
178	Hector Field, North Dakota	F-101B
179	Duluth ANGB, Minnesota	F-101B
186	Great Falls IAP, Montana	F-102A
190	Boise Air Terminal, Idaho	F-102A
194	Fresno Air Terminal, California	F-102A
196	Ontario IAP, California	F-102A

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by THOMAS W.

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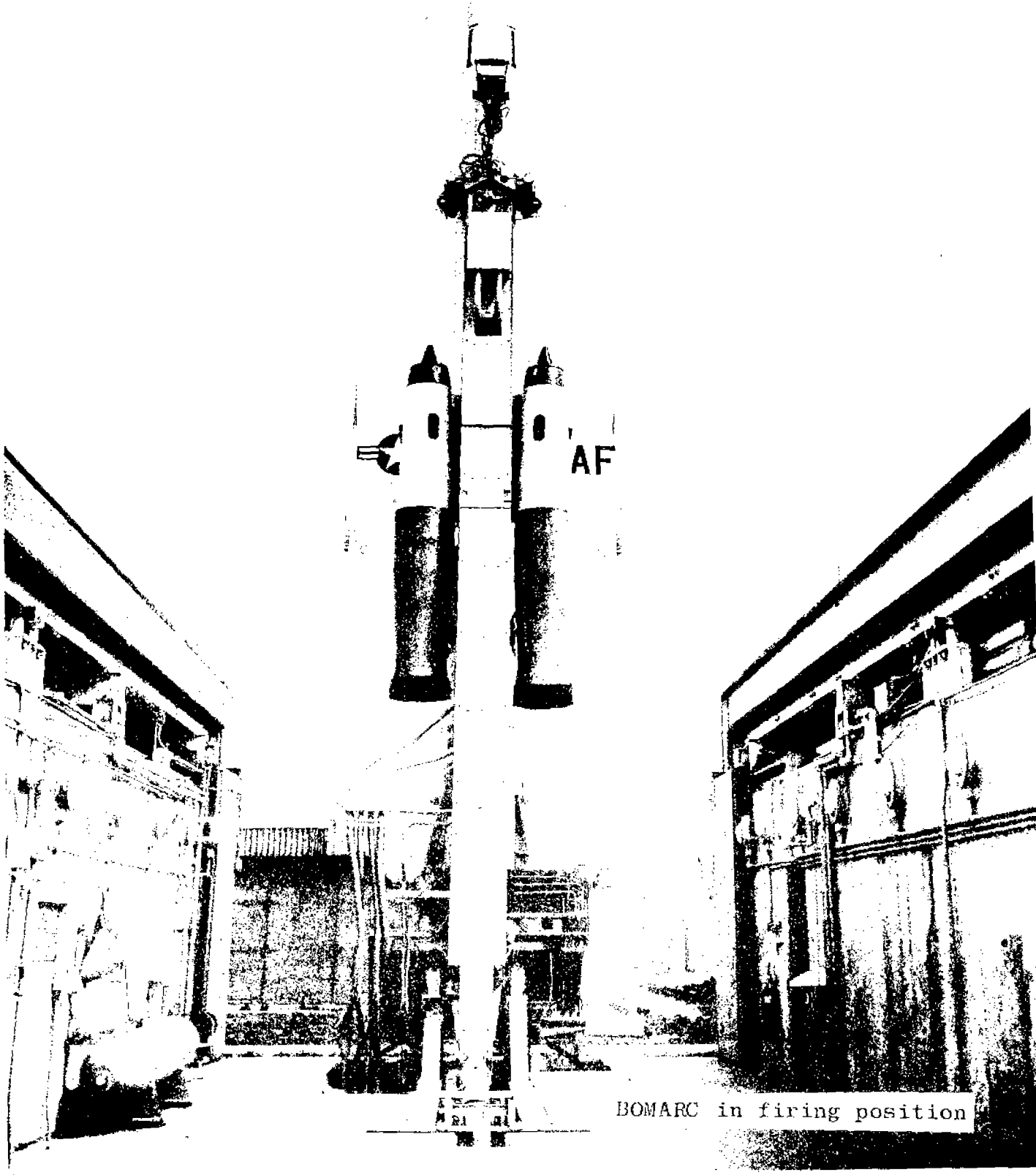

BOMARC in firing position

ADC HISTORICAL STUDY NO. 21

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BOMARC AND NUCLEAR ARMAMENT 1951-1963

by THOMAS W. RAY

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INTRODUCTION: THE SIGNIFICANCE OF BOMARC WARHEADS

In September 1959, ADC began integrating nuclear-armed ground-to-air BOMARC missiles into its weapons inventory,* thereby strengthening and intensifying the command's capability to down bombers attacking America's northeastern industrial complex. But certain disadvantages accompanied their employment. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

* For BOMARC planning, development, construction and testing from 1950 to 1962, see ADC Historical Study No. 14, History of Air Defense Weapons 1946-1962, pp. 162-89, 302-66. The story is continued to 1963 in ADC Historical Study No. 18, Interceptor Missiles 1962-1963.

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

Aside from the formidable blast damage and plutonium poisoning that would ensue, the entire structure of America's offensive-defensive posture could be jeopardized at home and abroad. Congress might see fit, in event of such an accident, to outlaw further use of atomic weapons inside the U.S.; while NATO nations presently permitting the United States to store and maintain atomic arms abroad would posssibly abrogate these privileges. America's military strength would be cut to a fraction, in consequence. Not to be overlooked was the possibility, admittedly remote, that an "accidental war" would be started. Thus, the importance of averting nuclear accidents with BOMARC warheads was, essentially, of staggering proportions.[1]

Warhead Planning and Development, 1951-1959. While planning for the BOMARC warhead started as early as 1951, several years elapsed before its development actually got underway. Between times, a number of things had to be ironed

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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out. The strength of the weapon, together with its dimensions and weight, had to be decided; authorization and funding for its production had to be accounted for. It was USAF that apparently first seized the initiative, informing ADC in early 1951 that a study was in progress to determine whether or not BOMARC should be fitted with an atomic warhead. ADC announced on 31 January 1952 that a formal requirement existed for incorporating nuclear warheads in air defense weapons, including ground-to-air missiles like BOMARC. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954) But the XW-7 was soon ruled out, chiefly because of weight and size factors, so that by late 1953, the prospects of adopting a warhead already available had lessened considerably.

Nevertheless, other efforts toward gaining atomic ordnance for BOMARC bore fruit by this time. ARDC, during Project Heavenbound (late 1952-early 1953), established the feasibility of mating a nuclear warhead with BOMARC; and the Joint Chiefs of Staff, about the turn of the year (winter of 1952-53), sanctioned their marriage. What

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remained, therefore, was to pick a warhead that would not demand serious changes in the BOMARC missile then under development.[2]

When on 27 January 1953 the JCS notified the Atomic Energy Commission that a military requirement obtained for an atomically-armed surface-to-air missile for air defense purposes, the XW-12 warhead adapted to BOMARC was in mind. And when ADC on 23 March 1953 reaffirmed its need for integrating atomic warheads into future BOMARC's, USAF answered with strong reassurances that some warhead was in the offing. But it was not destined to be the XW-12, which weighed about 600 pounds and measured about 22 inches long. In late 1953, the BOMARC project officer bargained for a lighter warhead, as yet undeveloped, because the XW-12, if used, would reduce the BOMARC range to 75 miles or less, according to studies then completed. Accordingly, a 250-pound warhead was asked for on 16 November 1953, that would be eighteen inches in diameter by 30 inches long.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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Joined to the warhead was an adaption kit containing arming and fuzing systems, power supply and the network of hardware and circuitry essential to operate them (see glossary).[3]

Scarcely was the request made for a 250-pound warhead when the conclusions of a Boeing study were circulated declaring that BOMARC could accomodate, without sacrificing range, a warhead up to 500 pounds in weight and 22 inches in diameter. On 14 April 1954, therefore, AEC was forwarded a formal requirement for developing a BOMARC warhead characterized preferably by a diameter of 22 inches, a weight of about 350 pounds and a length of 30 inches, but in any

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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case not to exceed 500 pounds in weight, 22 inches in diameter and 35 inches in length. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

Particular emphasis was focused on safety devices and techniques to insure positive warhead control at all times -- while in storage, on alert and in flight.[4]

But even these characteristics, though compatible with the BOMARC missile, were subjected to further changes. Subsequent target destruction studies revealed the advisability of pocketing greater nuclear yields; and the ever-advancing state of the art conduced to the packaging of greater yields in smaller, proportionately lighter, containers. Not till Fiscal Year 1956 were revised warhead needs balanced sufficiently with BOMARC capabilities, however, to permit development of the then-called XW-40 warhead (later redesignated MK-40). (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

It possessed the self-contained "one-point" safety feature* designed to insure against premature nuclear explosions. Because of its heavy weight and sizeable dimensions, special tools, including a warhead loading device, were fabricated together with a general installation dolly, for purposes of handling, positioning, installing, removing and transporting the warhead.[5]

For some time before the MK-40 was even authorized, let alone developed, there existed a standing requirement for a less powerful, non-nuclear High Explosive warhead.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

But one by one, for reasons of economy or impracticability, these programmed variations were cancelled, so that by 1959 when they first began trickling in, MK-40's were the sole warheads produced for tactical use with both the CIM-10A liquid propellant (formerly designated IM-99A) and the CIM-10B solid propellant BOMARC (formerly designated IM-99B).[6]

General Safety Considerations. Maintaining ADC's future atomic arms free from unauthorized or accidental detonation (without disabling them of their nuclear impact when needed) entailed guarding them against three categories of vulnerability: (1) technological imperfections and malfunctions; (2) human errors that traditionally had figured high -- over fifty per cent -- in accident causation; and (3) deliberate attempts to trigger them without authorization (either by saboteurs or persons of unbalanced mentality). The first category, technological imperfections

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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and malfunctions, included not only defective apparatus inside and attached to the BOMARC warhead, but also ground handling equipment, storage and checkout facilities, and launching equipment coming into direct or indirect contact with the MK-40. Fortunately, ADC was not alone in facing these problems; other USAF commands (including AFSC, AFLS and ATC), the Atomic Energy Commission, the Joint Chiefs of Staff, and various prime contractors, among others, were also deeply involved.[7]

Warhead Facilities and Safeguards. Years before BOMARC sites sprang up to loop their protective ring around the industrial complex of northeastern United States,* much thought and considerable planning was concentrated on adopting a ready storage posture for the CIM-10A and B best suited from the standpoints of efficiency, tactical effectiveness, economy, and safety. So, while they might be launched and matched, at a moment's notice, against oncoming hostile targets, they would be afforded, as much as was

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7. RESTRICTED DATA, Ikle, et al, op. cit., 15 Oct 1958.

* In September 1959, McGuire became the first of eight U.S. BOMARC sites to become operational, the others joining McGuire from December 1959 to 1962.

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possible, continuous protection against the three categories of vulnerability described above. To house nuclear-armed, Boeing-made CIM-10A/B missiles in a ready storage status (wherein each CIM-10A was capable of being launched within a period of two minutes, and each CIM-10B in 30 seconds, during any time of day or night), rectangular shelters made of reinforced concrete were engineered and spaced in clusters of 28 in compliance with explosive safety-distance criteria, with a view to confining any damage resulting from an accidental detonation of warhead HE or rocket motor propellant. Inside each of these concrete shelters, a single alert missile attached to a launcher erector mechanism laid in a horizontal attitude.

Once each missile was firmly in place and fully attached, its nuclear warhead was installed; for it was only while in the shelter, properly fastened, that the BOMARC and its warhead were mated. For purposes of launching, the shelter roof opened at the center, separating so the missile could be raised by the launcher erector to stand, like a sentinel on guard, vertically erect. When the missile finally reached, within seconds, an attitude perpendicular to the floor, the launcher erector that ordinarily held it automatically released its grip and descended, leaving the

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missile, still standing vertical, awaiting lift-off instructions from the SAGE Center that provided its computerized command guidance signals. Besides "one-point" safety devices installed to prevent full-scale blasts on site or prematurely in flight (described above), a low-altitude self-destruction system was incorporated, and ordinarily set between 7,000 and 10,000 feet altitude, to protect ground personnel from atomic scorching. The warhead was armed during the terminal phase of BOMARC flight, then fired by an influence fuze when within the target's range of destruction. Those MK-40 warheads not mated with BOMARC's were stored in the nearby Warhead Storage and Maintenance Building. Also contained in this building were tools, instruments and facilities employed in receiving, inspecting, checking, and testing the warheads, which were subjected to a confidence check every 30 days. To guard against unauthorized penetrations, a chain-link security fence over seven feet high was wrapped around the entire BOMARC compound. A proportionately large-sized air police force guarded each access gate to bar admittance to all but authorized persons, forming, moreover, a sabotage alert team; while anti-intrusion detection and alarm devices and flood lights turned on to brighten certain areas at night, provided further sureties against unwanted

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penetrations. To guarantee that even a person who, ostensibly, was authorized admittance could not gain access to a warhead while alone when he might, if mentally unbalanced or serving as an enemy agent, try to trigger a detonation, the "buddy-system," later redesignated "two-man concept," was rigorously enforced. Before access was allowed to a warhead for any purpose, at least two persons knowledgeable of the intricacies of the task at hand were required to be present.[8]

SAFETY RULES AND DEVICES, 1959-1963

As suggested above, the warhead could be mated with BOMARC missiles only under certain carefully defined conditions fully controlled by technicians trained in this craft. The processes involved, together with all other activities of warhead-impregnated BOMARC's, were painstakingly thought out long in advance of BOMARC's advent on the air defense scene, to guarantee the utmost in nuclear safety. Safety rules that governed warhead activities were first developed and tested by USAF's Nuclear Weapons Systems Safety Group

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8. Wright Air Dev Center, ARDC, op. cit., Jan 1956, p. 45; ADC, Headquarters USAF Air Defense Command Operation Employment Plan for the IM-99B, Jan 1960; ADCM 27-9, Program Control Plan IM-99A, 15 May 1959; ADCM 27-11, Program Control Plan IM-99B, 15 May 1959; Hist of EADF, Jan-Dec 1959, pp. 127-30.

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(NWSSG), reviewed by the Joint Chiefs of Staff and Department of Defense, then upon approval, were sent for the President's signature. Hereupon they became the certified safety rules. To insure that the safety rules were implemented to the letter, check lists, technical orders and SOP's were drawn up and published to spell out, in minute detail, each operation in the sequence of operations, so that technicians, working as a team, were enabled to double check each step taken in the progression of steps involved.

Not till December 1959 -- several months after the first CIM-10A squadron was pronounced operational -- were interim safety rules approved for mating the MK-40 with the CIM-10A. Delay stemmed in part from objections raised by the NWSSG that included concern over the absence of physical restraints for BOMARC missiles mounted on their launcher erector mechanism in a ready storage, horizontal position. An important purpose of safety rules was to preclude all chances of inadvertantly launching a BOMARC; but the lack of horizontal restraints seemed like an invitation to trouble from this quarter. What was to check the forward progress of a missile if its boost rocket accidentally ignited? Consequently, USAF purposely withheld authorization

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for mating MK-40 warheads with CIM-10A's until April 1960, by which time arrangements had been made to apply the needed restraints.[9]

Apart from re-emphasizing the necessity for erecting security fencing and implementing the "two-man concept," the interim safety rules outlined procedures for accomplishing 30-day tests on ready storage missiles armed with the MK-40 and for conventional control of the missiles while serving in alert ready storage status. As to the first, the shelter safety plug was removed (to preclude the reception of "fire-up" signals) as was the warhead arming plug (where a safety plug was placed in its stead). Among tests that ensued was a continuity check of the arming programmer and a functional checkout of the primary and secondary fuzes. Pressure and electrical continuity checks were made on the warhead. BOMARC CIM-10A's ordinarily in ready storage status were protected against inadvertent launches by a requirement for deliberate, coordinated efforts by persons at two geographically separated points, the BOMARC site and the SAGE direction center. The special BOMARC switches (accessible only to the

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9. Hist of ADC, Jan-Jun 1959, pp. 229-31; Hist of ADC, Jul-Dec 1959, pp. 139-41; Hist of ADC, Jan-Jun 1960, pp. 117-22.

[redacted]

Senior Director and Senior Weapons Director at the SAGE center), one of which had to be actuated when launching a BOMARC, possessed mechanical guards that were kept safety sealed. When the interim safety rules were first issued, a condition of maximum readiness was required before the seal could be broken on a Special BOMARC switch. But a need existed to actuate the switch during the Systems Readiness Check (SRC), to provide SAGE sector commanders with confidence that CIM-10A's would respond properly to fire-up and pre-launch SAGE signals. So the CIM-10A safety rules, which had been granted final approval by the DOD in February 1961, were accordingly amended to permit use of the special switch during an SRC, providing the missile involved was rendered inert. Safety rules governing CIM-10B operations (similar to those authorized for CIM-10A) received interim DOD approval at mid-1961.[10]

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10. RESTRICTED DATA, Msg AFCFN-N, USAF to ADC, 11 Dec 1959 [Doc 153 in Hist of ADC, Jul-Dec 1959]; ADCM 27-9, op. cit., 15 May 1959; ADCM 27-11, op. cit., 15 May 1959; Hist of ADC, Jan-Jun 1960, pp. 119, 122-23; Hist of ADC, Jul-Dec 1960, pp. 189-90; Hist of ADC, Jul-Dec 1961, pp. 249-53; RESTRICTED DATA, ADCSA-M 423, ADC to 26 and 30 ADs, 24 Feb 1961 [DOC 4]; RESTRICTED DATA, Msg ADCSA-M 548, ADC to Dep IG for Safety, 15 Mar 1961 [DOC 5]; RESTRICTED DATA, Msg ADCSA-M 1379, ADC to 26 AD, et al, 30 Jun 1961 [DOC 6]; RESTRICTED DATA, Msg AFIIS 85030, USAF to CINCNORAD, 12 Jul 1961 [DOC 7].

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But a serious hitch was discovered in January 1962 as regards CIM-10B safety. During a USAF CIM-10B safety survey of the 22 ADMS (Langley), it was learned that a psychotic or subversive individual having knowledge of CIM-10B operations conceivably might trigger an unauthorized launch of an CIM-10B by himself, either from the operations center at the CIM-10B site (IMSOC), or the parent SAGE direction center. Several methods were feasible, including the manual insertion of a track identified as hostile onto certain computer tapes. While a solution was being sought, the "two-man concept" was implemented at the critical areas in the IMSOC containing control equipment vulnerable to such manipulation. Whenever access to the equipment was necessitated for making adjustments or repairs, two persons familiar with its operations were present. After considerable study and analysis, an ironclad inspection, storage and control system was established (using the "two-man concept" under certain conditions) to assure the validity and inviolability of computer programming tapes employed to help activate CIM-10B's.[11]

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11. Hist of ADC, Jul-Dec 1961, pp. 150-51; Msg AFINS 3-B-2-50-62E, Dir Nuc Safety to AFSWC (Kirtland), 15 Feb 1962 [DOC 8]; Msg ADODC 455, ADC to 26 AD, 15 Feb 1962 [DOC 9]; RESTRICTED DATA, Msg AFIDF-A-3-2-8E, Dep IG for Safety to

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By the end of 1962, NWSSG concluded that the CIM-10B fire circuitry from the SAGE Center to the CIM-10B site must somehow be altered to require a deliberate, conscious manual action on the part of authorized personnel at both locations before an CIM-10B launch could be triggered. In May 1963, therefore, ADC called for proposals from the field to this end, resulting in two promising suggestions. Both suggestions were then sent to OOAMA for evaluation. After further study, OOAMA recommended the one that had emanated from the 26th Air Division, proposing that a blank unwired telephone plug be inserted into the data input jack of the AN/GSA-28 prelaunch translator's impedance matching panel. OOAMA also believed that attaching a red fabric streamer to the blank plug would be helpful, since the blank plug had to be removed manually to restore the circuitry to its former tactical configuration and the streamer would call visual attention to the plug's position. In July 1963, ADC adopted this method for use, ordering that the streamers be made to extend at least ten inches long. The IMSOC duty

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[Cont'd] ADC, 20 Feb 1962 [DOC 10]; RESTRICTED DATA, BLACK BEAR 163, Msg ADCSA-W 615, ADC to Air Divs, et al, 2 Mar 1962 [DOC 12]; Msg ADOOP-WM 704, ADC to AFSWC, et al, 13 Mar 1962 [DOC 13]; Msg AFINS-3-B-6-19-62-E, Dir Nuc Safety to ADC, 12 Jun 1962 [DOC 14]; Msg ADOOP-EO 1674, ADC to Air Divs, 19 Jun 1962 [DOC 15].

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officer was designated the individual responsible for removing the blank plug when properly directed by the SAGE Direction Center.[12]

Weeks after CIM-10B safety was assured, Canada, in August 1963, indicated its willingness to grant something it had withheld for years -- authorization for equipping two Canadian CIM-10B BOMARC sites (North Bay and La Macaza) with nuclear warheads maintained under U.S. control. An agreement to this end was consummated on 18 October 1963. Safety rules, which had been drawn up to govern MK-40 operations and insure their control by U.S. representatives, were given interim approval in November 1963, signaling the go-ahead for delivering warheads to the Canadian sites.[13]

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12. Msg ADCSA-W 603, ADC to Dir Nuc Safety, 28 Feb 1963 [DOC 16]; Msg ADCSA-W 620, ADC to 26 AD, 1 Mar 1963 [DOC 17]; Msg ADOOP-WM 1719, ADC to 26 and 30 ADs, 2 May 1963 [DOC 18]; NOFORN EX CANADA, Msg 30-OOP-M S-0785-63, 30 AD to ADC, 14 May 1963 [DOC 19]; Msg ADOOP-WM 2019, ADC to OOAMA, 3 Jun 1963 [DOC 20]; Msg OONAT 447, OOAMA to ADC, 20 Jun 1963 [DOC 21]; Msg BLACK BEAR 63-55, ADOOP-WM 2809, ADC to 26 and 30 ADs, et al, 26 Jul 1963 [DOC 22].

13. RESTRICTED DATA, USAF, Current Status Report, Aug 1963, p. 3-2 [HRF]; ADC, ADLPW-A, Weekly Act Repts, 14 Jul and 21 Aug 1963 [HRF]; Msg AFXOPN 64861, USAF to CINCONAD, 22 Oct 1963 [DOC 23]; Msg CEOC-F X-258, CINCONAD to JCS, 23 Oct 1963 [DOC 24]; NOFORN EX CANADA, Msg ADCSA-W 5743, ADC to CANAIRHEAD, et al, 27 Nov 1963 [DOC 25].

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Aside from safety rules and devices, certain command measures were taken to re-inforce the structural framework of the safety program. The ADC Directorate of Missile/Nuclear Safety (subsequently redesignated Weapons System Safety Division) -- originally established under the Chief of Safety in late 1958 -- was expanded to encompass nuclear safety problems peculiar to BOMARC. The "Black Bear" communications system,* among other innovations, was adapted to the needs of BOMARC squadrons, while BOMARC nuclear directives, once codified in final form, were incorporated into the -136 technical manual series. A nuclear inspection and assistance team was organized by the 26th Air Division in late 1960 to visit BOMARC sites quarterly for purposes of standardizing procedures and enforcing close adherence to pertinent JCS, USAF, and ADC directives and regulations. Besides these and other measures, the USAF and ADC inspectors

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* The "Black Bear" communications system entailed the special transmission of instructions to the field regarding nuclear activities, receiving preferential, expeditious treatment that automatically included among addressees all units directly involved. Procedural changes, for instance, instead of facing delays and possible omissions resulting from retransmissions down the chain of command, reached the pertinent tactical units directly, thereby assuring practically instantaneous implementation.

general made nuclear safety a special subject for investigation by their inspection teams.[14]

Inspections. To check the methods by which nuclear warheads were handled, loaded, stored and protected at BOMARC squadrons, USAF and ADC inspection teams regularly conducted Initial Capability Inspections, Capability Inspections, and Nuclear Weapon Spot Checks. The Initial Capability Inspection was held 30 or more days before the squadron was scheduled to receive nuclear ordnance, to determine whether or not it was ready to receive them. Capability Inspections which accounted for the majority of inspections performed, were conducted within 90 days after the unit obtained nuclear weapons, and thereafter at intervals not exceeding 18 months. When possible, the capability inspection was performed in conjunction with an Operational Readiness Inspection (ORI). Nuclear weapon Spot Checks, on the other hand, were performed on any unit at any time. For the most part, the inspection, and particularly the Capability Inspections, covered the following nuclear weapon activities: compliance with published safety rules, technical instructi and authorized check lists; security system (including the intrusion alarm network as well as implementation of the

14. Msg 26MLP-8-833, 26 AD to ADC, 19 Aug 1960 [Doc 228 in Hist of ADC, Jul-Dec 1960].

"two-man concept"); warhead storage, maintenance and assembly; nuclear safety measures; warhead mating, testing and handling; and weapons personnel certification. Other phases of the inspections covered warhead supply, base logistical and administrative support, warhead training programs, and Explosive Ordnance Disposal (EOD) -- sometimes tested in conjunction with a simulated "Broken Arrow" exercise. While in most instances, the inspections resulted in satisfactory ratings, they served to uncover defects and reveal shortcomings which, if left uncorrected, might lead to serious consequences. Units adjudged unsatisfactory were relieved of their combat-ready status until proved proficient with nuclear weapons within 90 days after failing an inspection.[15]

Although USAF had singled out nuclear safety as a special subject for inspection in late 1959, months elapsed before qualified teams could be organized at USAF and ADC to bring this about. Until 1961 (when CIM-10B squadrons began phasing in), only the CIM-10A squadrons were involved. These became operational as follows: McGuire (September 1959), Suffolk County (December 1959); Otis (March 1960); Dow (June 1960); and Langley (October 1960) -- demonstrating

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15. AFR 123-9, 31 Aug 1960 [Doc 620 in Hist of ADC, Jul-Dec 1961]; AFR 123-6, 16 Nov 1961 [Doc 621 in Hist of

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beforehand or soon after, a capability to maintain, handle and process MK-40 warheads, along with fulfilling other functions associated with their care and safety. In addition, the 46th ADMS (McGuire) was subjected to, and passed a capability inspection between 22 May and 3 June 1960, while various aspects of nuclear safety were included in an Operational Readiness Inspection passed by the 6th ADMS (Suffolk County) in July 1960.[16]

One spot inspection, six capability and four initial capability inspections (conducted at seven BOMARC units) comprised the sum of BOMARC nuclear inspection during 1961. Four units received two inspections each. Seven of the 11 inspections were conducted by ADC; the others were performed by USAF. The findings, though largely encouraging, occasionally revealed serious defects.

An Initial Capability Inspection at the 22nd ADMS (Langley) from 11 to 13 January ended in a satisfactory

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[Cont'd] ADC, Jul-Dec 1961]; ADCR 122-2, "Missile/Nuclear Safety Criteria," 8 May 1961 [Doc 622 in Hist of ADC, Jul-Dec 1961].

16. Msg AFCRM-A 6-820, USAF (IG Inspection Team) to USAF, 3 Jun 1960 [Doc 196 in Hist of ADC, Jan-Jun 1960]; Msg 26CIG 018, 26 AD to ADC, 22 Jun 1960 [Doc 199 in Hist of ADC, Jan-Jun 1960]; Rpt, 6ADMS ORI, Operation Readiness Inspection of 26 AD, 22 Jul 1960, pp. E-21 to E-25 [Doc 246 in Hist of ADC, Jul-Dec 1960].

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rating for that unit, while a Capability Inspection at the 30th ADMS (Dow) the following month revealed shortcomings in its security system. They were not serious enough, however, to deprive the 30th of a satisfactory score. From 2 to 4 May, the 22nd ADMS (Langley) demonstrated for a second time in 1961 a satisfactory ability to maintain and handle its nuclear warheads, despite the uselessness of its acid facility, which at the time was closed down for repairs. An Initial Capability Inspection of the 37th ADMS (Kincheloe) in early June indicated it was ready to receive nuclear warheads.[17]

This pattern of universally satisfactory inspections continued through early November. The 74th ADMS (Duluth) proved capable of receiving nuclear warheads following an Initial Capability Inspection from 26 to 28 July. The 37th

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17. FORMERLY RESTRICTED DATA, Msg ADCIG-I 1-2, ADC Insp Team (IG) to USAF, 13 Jan 1961 [Doc 689 in Hist of ADC, Jul-Dec 1961]; Msg AFIRI-A-3-2-46, USAF Insp Team (IG) to USAF, 22 Feb 1961 [Doc 690 in Hist of ADC, Jul-Dec 1961]; Msg 26CIG 016, 26 AD to ADC, 13 Mar 1961 [Doc 691 in Hist of ADC, Jul-Dec 1961]; Msg ADCIG-I-C 664, ADC to USAF, 30 Mar 1961 [DOC 692 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I X-54, ADC Insp Team (IG) to 26 AD, 4 May 1961 [Doc 693 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, ADCIG-I 1123, ADC to USAF, 29 May 1961 [Doc 694 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, ADCIG-I 0021, ADC Insp Team (IG) to USAF, 3 Jun 1961 [Doc 695 in Hist of ADC, Jul-Dec 1961].

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ADMS (Kincheloe) underwent its second inspection of the year in October and was found clear of major flaws. And although the 74th ADMS (Duluth) during its second inspection (1 to 3 November) was observed to lack a nuclear weapons officer and to have certain undesirable peculiarities in its security system, it, too, was awarded a satisfactory grading.[18]

The first unsatisfactory rating did not come until mid-November, when the USAF inspection team declared the 6th unsatisfactory because six of its shelters were without a working intrusion alarm system, while all its shelters lacked an operating alarm system on the back doors. Since a manned guard system had not been implemented to substitute for the defective alarm system, the squadron was ruled vulnerable to sabotage. A manned security guard was immediately organized at the 6th to serve until the alarm deficiency was remedied; and on November 18, just three days after the first inspection, the squadron satisfactorily

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18. FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-2897, ADC Insp Team (IG) to Dep IG for Insp (USAF), 28 Jul 1961 [Doc 696 in Hist of ADC, Jul-Dec 1961]; Msg 37-CCR 10-72, ADC Insp Team (IG) to USAF, 26 Oct 1961 [ADCIG files]; Msg 74 CAS 74-61-383, 74 ADMS to USAF, 4 Nov 1961 [Doc 697 in Hist of ADC, Jul-Dec 1961]; Msg T/30/CIG 311, 30 AD to ADC, 28 Nov 1961 [Doc 698 in Hist of ADC, Jul-Dec 1961]; Msg ADCCS 2892, ADC to USAF, 22 Dec 1961 [Doc 699 in Hist of ADC, Jul-Dec 1961].

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passed a second inspection. Work soon began on the alarm system which entailed removing alarm connections from the shelter floor where accumulations of water had corroded and shorted them out, then installing new ones on shelter doors. By mid-January 1962, this work was completed and the intrusion alarm system at the 6th ADMS became operational.[19]

Although the next inspection, conducted at the 46th ADMS (McGuire) in November 1961, ended satisfactorily, the final inspection of the year resulted in another unsatisfactory rating. The 35th ADMS (Niagara), during an Initial Capability Inspection conducted between 27 November and 1 December, was discovered to possess a sizeable catalogue of failings, including insufficient manning in the special weapons section, inadequate administrative procedures, and substandard supervision in the warhead maintenance and processing areas. The squadron, moreover, was found short on

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19. Msg 880, 52 Ftr Gp to USAF, 16 Nov 1961 [Doc 700 in Hist of ADC, Jul-Dec 1961]; Memos for Rec, Col O.G. Cellini, ADCIG 15-17 Nov 1961 [Doc 701 in Hist of ADC, Jul-Dec 1961]; Interview with W. Jones, ADIEC-WB, 18 Mar 1961; Msg ADCIG 2568, ADC to NYADS, 16 Nov 1961 [Doc 702 in Hist of ADC, Jul-Dec 1961]; Msg NYCCR 4925, NYADS to USAF, 17 Nov 1961 [Doc 703 in Hist of ADC, Jul-Dec 1961]; Msg ADCIG 57469, ADC to USAF Dep IG for Insp, 11 Dec 1961 [Doc 704 in Hist of ADC, Jul-Dec 1961]; Msg ADCCS 2804, ADC to USAF Dep IG for Insp, 13 Dec 1961 [Doc 705 in Hist of ADC, Jul-Dec 1961]; IOC, ADIDC to ADCIG-I-AC, "Report of Capability Inspection, 6th ADMS,...13-15 Nov 1961," 20 Dec 1961 [Doc 706 in Hist

[redacted]

equipment, on technical publications, an on certain tools vital to its mission; while its security was assessed as under par for various reasons. In all, some 17 shortcomings were listed. The 35th, consequently, was declared "not ready to receive nuclear warheads."[20]

But these gloomy findings did not prove permanently disabling. Proper tools and technical publications were procured, intensive training of supervisory personnel was vigorously pursued, and various defects in the squadron's security situation were eliminated. The 26th Air Division's weapons standardization team spent several days at the 35th during December. Re-inspection occurred on 10 January 1962 and the 35th, with little difficulty, passed its initial capability re-inspection. Accordingly, the squadron was pronounced, "ready for receipt of nuclear warheads."[21]

[Cont'd] of ADC, Jul-Dec 1961]; Msg ADCCS 2936, ADC to USAF, 27 Dec 1961 [Doc 707 in Hist of ADC, Jul-Dec 1961]; Msg ADCIG-I 123, ADC to USAF, 16 Jan 1962 [Doc 708 in Hist of ADC, Jul-Dec 1961].

20. Msg NYMVC 61S-4928, NYADS to USAF, 18 Nov 1961 [Doc 709 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-474, ADC (IG Insp Team) to USAF, 3 Dec 1961 [Doc 710 in Hist of ADC, Jul-Dec 1961].

21. FORMERLY RESTRICTED DATA, Msg 26CIG 052, 26 AD to ADC, 29 Dec 1961 [Doc 711 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIF-I 62-38, ADC (IG Insp Team) to USAF, 12 Jan 1962 [Doc 712 in Hist of ADC, Jul-Dec

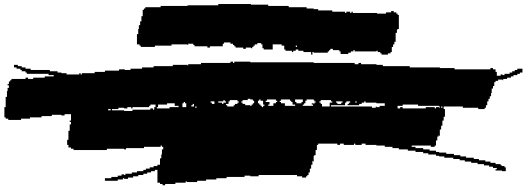
[redacted]

During 1962, 12 nuclear inspections of BOMARC units were accomplished, nine of which were conducted by ADC inspectors and the others by USAF inspectors. While most BOMARC squadrons were discovered to have one or more limiting deficiencies, they were generally not serious enough, except at two squadrons, to warrant an unsatisfactory rating. The deficiencies, in practically all cases, were corrected with alacrity. Although the Canadian government still prohibited MK-40 nuclear warheads on Canadian soil during this time, one of the two Canadian BOMARC sites was given, and successfully passed, an Initial Capability Inspection. Lt. General W. H. Blanchard, the USAF Inspector General, was apparantely impressed when he personally witnessed BOMARC technicians in action,[22] declaring:

> I saw operating room technique in the mating of a nuclear warhead on air defense missile BOMARC. The strictness of the technique went something like this: One man reading the check list, another airman picking up and passing the proper tool to a mechanic who performed the operation, the check list man being sure that the function was properly executed - 'scalpel, suture, sponge!'

[Cont'd] 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 164, ADC to USAF, 22 Jan 1962 [Doc 713 in Hist of ADC, Jul-Dec 1961].

22. ADC Munitions Bulletin, No. 63-5, 15 May 1963, p. 1 [DOC 26].



An operating room technique practiced daily by our nuclear Air Force technicians.

The two sites that did not have so easy a time of it during their first tests of 1962 were the 22nd ADMS (Langley) and 30th ADMS (Dow). The 22nd was found blameworthy for permitting uncertified loading crew members and supervisors to mate and detach nuclear warheads -- guilt for which, taken alone, constituted grounds for an unsatisfactory rating. Moreover, management and supervision of the weapons training program proved unacceptable, partly because a qualified nuclear armament officer had not yet been assigned. The squadron, accordingly, was stigmatized with an unsatisfactory rating by the inspection team in September. Personnel changes were soon effected at the 22nd and an intensive retraining program was completed, whereupon armament personnel were recertified for handling and servicing nuclear warheads. About six weeks after the unsatisfactory test, from 31 October to 1 November, the squadron was subjected to, and passed, a re-inspection of its nuclear activities.

The 30th ADMS at Dow had committed certain censurable mistakes during an inspection in early October for which it, too, received an unsatisfactory rating. Besides having

an uncertified person handling nuclear armament, the 30th lacked a positive safeguard for barring unauthorized personnel access to warhead areas, and certain weapons tools had not been procured. Most of these deficiencies were sufficiently remedied within three weeks time, so that the 30th ADMS, upon re-inspection on 1 to 2 November, passed and was re-stored to its previous nuclear-alert status.[23]

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23. FORMERLY RESTRICTED DATA, Msg ADCIF-I 62-38, ADC to USAF, 12 Jan 1962 [Doc 712 in Hist of ADC, Jul-Dec 1961]; Interview with Lt Cols R.E. Dent, Jr. (3 May 62) and H.R. Junker (9 May 62), ADCIG; Msg AFOOP-DE 93997, USAF to ADC, 19 Jan 1962 [DOC 27]; Msg ADCIG-I-W 343, ADC to USAF, 6 Feb 1962 [DOC 28]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 456, ADC to USAF, 15 Feb 1962 [DOC 29]; Msg ADCIG-I 74-62-234, ADC to USAF, 23 Feb 1962 [DOC 30]; Msg ADCIG-I 764, ADC to USAF, 20 Mar 1962 [DOC 31]; FORMERLY RESTRICTED DATA, Msg 26CIG 007, 26 AD to ADC, 22 Mar 1962 [DOC 32]; FORMERLY RESTRICTED DATA, Msg ADCIG-W 62-549, ADC to USAF, 24 May 1962 [DOC 33]; FORMERLY RESTRICTED DATA/NOFORN EX CANADA, Msg ADCIG ORI Fld Unit 45-62, ADC to USAF, 9 Jun 1962 [DOC 34]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG Fld Insp Team W-62-1, ADC to USAF, 13 Sep 1962 [DOC 36]; NOFORN, Msg 26CIG 032, 26 AD to ADC, 5 Oct 1962 [DOC 37]; Msg ADCIG-W-62-8, ADC to USAF, 2 Nov 1962 [DOC 38]; FORMERLY RESTRICTED DATA/NOFORN, Msg 26CIG 043, 26 AD to ADC, 23 Nov 1962 [DOC 39]; FORMERLY RESTRICTED DATA, Msg ADCIG 3354, ADC to USAF, 4 Dec 1962 [DOC 40]; FORMERLY RESTRICTED DATA, Msg ADCIG-W-62-4, ADC to USAF, 9 Sep 1962 [DOC 41]; FORMERLY RESTRICTED DATA/NOFORN, Msg 26CIG 035, 26 AD to ADC, 26 Oct 1962 [DOC 42]; FORMERLY RESTRICTED DATA, Msg ADCIG-W 62-9, ADC to USAF, 2 Nov 1962 [DOC 43]; FORMERLY RESTRICTED DATA/NOFORN, Msg 26CIG 041, 26 AD to ADC, 20 Nov 1962 [DOC 44]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG 3157, ADC to USAF, 16 Nov 1962 [DOC 45]; Msg AFIWI-C-2C432-62, USAF (Dep IG for Insp) to USAF, 7 Nov 1962 [DOC 46]; Msg AFIWI-C-2 62-1200, USAF (Dep IG for Insp) to USAF, 9 Nov 1962 [DOC 47].

1962 INSPECTIONS

Unit	Base	Month	Result	Type Inspection
35 ADMS	Niagara Falls	Jan	Satisfactory	ADC Initial Capability Re-Inspect.
446 SAM (Canada)	North Bay	Feb	Satisfactory	ADC Initial Capability Inspection
74 ADMS	Duluth	Feb	Satisfactory	ADC Capability
26 ADMS	Otis	27 Feb-2 Mar	Satisfactory	USAF Spot Inspection
35 ADMS	Niagara Falls	May	Satisfactory*	ADC Capability
46 ADMS	McGuire	Jun	Satisfactory	ADC Capability
22 ADMS	Langley	Sep	Unsatisfactory	ADC Capability
30 ADMS	Dow	Oct	Unsatisfactory	ADC Capability
22 ADMS	Langley	31 Oct-1 Nov	Satisfactory	ADC Capability Re-Inspection
30 ADMS	Dow	Nov	Satisfactory	ADC Capability Re-Inspection
6 ADMS	Suffolk	Nov	Satisfactory*	USAF Spot Inspect.
35 ADMS	Niagara Falls	Nov	Satisfactory*	USAF Spot Inspect.

* No major defects found to limit the squadron's capability.

The number of BOMARC inspections conducted during 1963 amounted to eleven, all of which were performed by ADC inspectors. Ten of the eleven ended with satisfactory grades. Seven of the units earned satisfactory ratings without shortcomings serious enough to limit their operational capability; the three squadrons that passed but possessed pronounced defects soon corrected them. Since Canada, in late 1963, agreed to accept nuclear warheads under U.S. control, as noted above, Canadian BOMARC squadrons were scheduled thereafter for periodical inspection.[24]

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24. FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI Fld Unit 63-3-11, ADCIG ORI Team to USAF, 15 Mar 1963 [DOC 48]; FORMERLY RESTRICTED DATA, ADC ORI of Bangor ADS, Capa Insp of 30 ADMS 4-7 Mar 1963, 16 Mar 1963, pp. D-14, D-17 [DOC 49]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG-R 1547, ADC to USAF, 16 Apr 1963 [DOC 50]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG-R 1665, ADC to USAF, 26 Apr 1963 [DOC 51]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI Fld Unit 19-1-2 1383, ADC ORI Team to USAF, 29 Aug 1963 [DOC 52]; FORMERLY RESTRICTIVE DATA, Msg ADMDC 4019, ADC to 26 AD, 5 Sep 1963 [DOC 53]; FORMERLY RESTRICTED DATA/NOFORN, Msg 26CIG 178, 26 AD to ADC, 19 Sep 1963 [DOC 54]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI Fld Unit 63-21-2, ADCIG ORI Team to USAF, 16 Sep 1963 [DOC 55]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCCS 5328, ADC to USAF, 18 Oct 1963 [DOC 56]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI-CI Fld Unit 63-24-2, ADC ORI Team to USAF, 18 Oct 1963 [DOC 57]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG IG Fld Unit 63-26-1, ADCIG ICI Team to USAF, 8 Nov 1963 [DOC 58]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI-CI Fld Unit 63-30-2, ADC ORI Team to USAF, 23 Nov 1963 [DOC 59]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCIG ORI Fld Unit 63-33-1, ADCIG IG Team to USAF, 16 Dec 1963 [DOC 59A].

1963 INSPECTIONS

Unit	Base	Month	Result	Type Inspection
30 ADMS	Dow	Mar	Satisfactory*	ADC Capability
6 ADMS	Suffolk County	Apr	Satisfactory*	ADC Capability
37 ADMS	Kincheloe	Apr	Satisfactory*	ADC Capability
74 ADMS	Duluth	Jul	Unsatisfactory	ADC Capability
74 ADMS	Duluth	Aug	Satisfactory*	ADC Capability Re-Inspection
26 ADMS	Otis	Aug	Satisfactory	ADC Capability
22 ADMS	Langley	Sep	Satisfactory	ADC Capability
35 ADMS	Niagara Falls	Oct	Satisfactory*	ADC Capability
446 SAM (Canada)	North Bay	Nov	Satisfactory*	ADC Initial Capability
46 ADMS	McGuire	Nov	Satisfactory	ADC Capability
447 SAM (Canada)	La Macaza	Dec	Satisfactory*	ADC Initial Capability

* No major defects found to limit the squadron's capability.

The single instance of an unsatisfactory rating during 1963 stemmed from an ADC Capability Inspection of the 74th ADMS (Duluth), held from 10 to 13 July. Discrepancies abounded in several categories of activity. Maintenance had been performed on war reserve warheads by airmen whose certification for this work had lapsed; inadequacies cropped up in the training program and in the administration and management of the armament section; and weaknesses were detected in the security control system. The 30th Air Division thereupon rushed certified armament personnel from the 37th ADMS (Kincheloe) to the 74th to perform warhead maintenance until corrective measures were completed. Within a month's time, all that had been found wrong was righted: armament personnel underwent rigorous training concluding with their proper certification; and the training program, among other things, was extensively revamped. From 13 to 15 August, the 74th ADMS underwent, and successfully passed, a capability re-inspection without detection of any major shortcomings that would hamper the squadron's future operational capability.[25]

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25. FORMERLY RESTRICTED DATA, ADC ORI of 74 ADMS, Capa Insp Portion, 17 Jul 1963, pp. 11-14 [DOC 60]; NOFORN EX CANADA, Msg 30-NOOP S-1133-63, 30 NORAD Rgn to NORAD, 16 Jul 1963 [DOC 61]; Msg 30-MME-D-S-1164-63, 30 AD to ADC,

[redacted]

NUCLEAR MISHAPS

Regardless of how carefully safety rules and check lists were composed and disseminated, how assiduously inspection teams checked tactical BOMARC sites, and how thoroughly nuclear weapon technicians were trained in the art of handling and working with warheads, the command was sure to suffer mishaps. Although the accident rate objective never ceased being zero per cent, ADC personnel handled hundreds of warheads every month. The opportunity for error was manifold and the Law of Chance had to be reckoned with. But despite the growing number of BOMARC CIM-10A/B missiles integrated into the command from late 1959 to 1963, the number of mishaps involving ADC's MK-40 warheads declined, especially after 1961, testifying to the effectiveness of the nuclear operating, training, inspection and safety programs. Four years skipped by without a nuclear catastrophe -- that most decisive of all criteria for judging the success or failure of ADC's nuclear safety efforts.

[Cont'd] 14 Aug 1963 [DOC 62]; Msg 74-63-590, 74 ADMS to USAF, 15 Aug 1963 [DOC 63]; FORMERLY RESTRICTED DATA/NOFORN, Msg ADCCS 3004, ADC to USAF, 21 Aug 1963 [DOC 64].

[redacted]

Only CIM-10A missiles were involved in mishaps during 1960 since CIM-10B squadrons were not formed and equipped until 1961-62. Some 48 episodes in all were reported in 1960, involving accidents, incidents, one-time instances of damage, and hazards mostly minor in nature. Among those involving tactical CIM-10A's in ready storage, equipped with warheads, were several inadvertent erections. Without purposely actuating them, the roofs of four shelters, on 1 May, 24 May, 30 July and 30 September 1960, suddenly parted and the CIM-10A's theretofore laid out horizontally rose upright in their coffin-like structures. In most cases, certain electrical plugs and jacks had corroded, causing a short-circuiting that resulted in the erections. The corroded elements were quickly exchanged for good ones to prevent further mishaps of this kind. Fortunately, no damage ensued.[26]

Two accidents occurred in 1960 that did result in serious damage, however. The first, which took place at the 46th ADMS (McGuire) on 7 June 1960, was the worst BOMARC accident as of this writing, and perhaps the worst involving all of ADC's nuclear weapons, the MB-1 and GAR-11 included.

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26. RESTRICTED DATA, Rpt, ADC Proj 10B, "Summary of the ADC Missile/Nuclear Accident Safety Experience for 1960," 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961].

[redacted]

A CIM-10A fitted with MK-40 warhead caught fire and burned. Both missile and warhead were destroyed, the fire being caused by a defective helium tank that exploded, scattering fragments in all directions. While fortunately no atomic detonation ensued, a chain of events was started that, in effect, partially disabled the CIM-10A force for more than a year. The helium tanks of all CIM-10A missiles in ready storage were, for safety's sake, depressurized from 4,300 pounds per square inch (psi) to recovery pressure at 2,150 psi -- about half their operational readiness and launching pressure -- relegating CIM-10A's to a limited standby capacity since it would take hours to restore all missiles to full 4,300 psi. Helium tanks were inspected by a field team and an inspection board at Boeing, and defective ones were replaced. But, laboratory tests conducted on helium tanks to simulate a decade of service life in a few month's time demonstrated that the tanks, though seemingly flawless, were subject to rupture when kept at 4,300 psi. Then, in 1961, a solution was adopted in Engineering Change Proposal (ECP) 391-4. By adding a 7,000 psi external helium "top-off" tank to each CIM-10A shelter, and maintaining the shelter's missile at only 3,000 psi helium pressure, ECP 391-4 promised both restoration

[redacted]

of the system to its intended two-minute alert capability, and protection of the system from the hazards of exploding helium tanks. Subsequent to the application of ECP 391-4, the helium pressure within the combat-ready missile was boosted from its regular 3,000 psi to full 4,300 psi pressure during the last 30 seconds before launch. By the end of October 1961, the modification of all CIM-10A shelters was completed, and the missiles, after more than a year on standby status, resumed a two-minute alert status.[27]

The danger from exploding helium tanks, however, was not the sole cause for anxiety as regards CIM-10A safety. BOMARC accidents, of course, could stem from other causes, such as the one responsible for the second 1960 accident at the Suffolk site in August. During a launch equipment check-out (LECO) of an CIM-10A, the missile was erected by the erector arm, as programmed. But then the nose clamps on the erector arm failed to release the missile once it reached its vertical firing position. Consequently, when the erector arm returned to its horizontal position, the

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27. Msg NYCVC 2799, NYADS to DFMSR (Norton AFB), 24 Jun 1961 [Doc 192 in Hist of ADC, Jan-Jun 1960]; Hist of ADC, Jan-Jun 1960, pp. 113-17; Hist of ADC, Jul-Dec 1960, pp. 181-87; Hist of ADC, Jan-Jun 1961, pp. 161-64; Hist of ADC, Jul-Dec 1961, pp. 251-52.

[redacted]

CIM-10A, instead of remaining upright, was pulled down too. Although the aft end of the boattail was badly damaged, there was no apparent damage to the launch shelter, and more important, to the nuclear warhead. Since the nose of the CIM-10A remained clenched between the nose clamps of the erector arm, technicians were forced to dig out the warhead by cutting through an access panel. The nose clamp unlock relay was repaired to prevent similar accidents in the future.[28]

Although the number of BOMARC mishaps amounted to more than forty-five during 1961, only three, as regards tactical BOMARCS, were more than minor in nature. The first of these occurred 28 March at the 6th ADMS (Suffolk County), when a CIM-10A, fully fueled and containing a safetied warhead, damaged its chilled water hoses which failed to disengage from the missile during an erection cycle. Again in July at the same squadron, a CIM-10A in ready storage erected inadvertently because of water seepage

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28. Msg 26MME-DC 8-321, 26 AD to Air Def Sectors, 16 Aug 1960 [Doc 224 in Hist of ADC, Jul-Dec 1960]; Msg AFCNS-O-A-8-65-60E, Dep IG for Safety (Suffolk) to Dep IG for Safety (Kirtland), 17 Aug 1960 [Doc 225 in Hist of ADC, Jul-Dec 1960]; RESTRICTED DATA, Rpg, ADC, Project 10B, "Summary of the ADC Missile/Nuclear Accident Safety Experience for 1960," 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961].

[redacted]

that had short-circuited various electrical connections. And, on 6 September, at the 26th ADMS (Otis), the chilled water "quick disconnect" hydraulic cylinder failed to retract properly during a missile erection sequence, and some damage ensued.[29]

BOMARC units, counting both test and tactical squadrons, experienced fewer mishaps in 1962 than the year before, as might be expected because of improved safety factors and the increased experience gained by armament technicians. There were 17 mishaps reported in all. The more serious ones during 1962 occurred at the 22nd ADMS (Langley) on 30 January and 13 August, the 35th ADMS (Niagara) on 15 June, the 6th ADMS (Suffolk County) on 21 September, and the 46th ADMS (McGuire) on 27 December. The two at Langley involved

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29. Msg CSA-642, 6 ADMS to USAF, 28 Mar 1961 [Doc 757 in Hist of ADC, Jul-Dec 1961]; Msg OONATI 38203, OOAMA to ADC, 16 May 1961 [Doc 758 in Hist of ADC, Jul-Dec 1961]; Missile Hazard Rpt, 6 ADMS to NYADS, 21 Jul 1961 [Doc 759 in Hist of ADC, Jul-Dec 1961]; Msg ADCSA-M 44328, ADC to 26 AD, 5 Sep 1961, [Doc 760 in Hist of ADC, Jul-Dec 1961]; Msg MNS 1348, 26 ADMS to USAF, 15 Sep 1961 [Doc 761 in Hist of ADC, Jul-Dec 1961]; Msg OONATI 68793, OOAMA to 26 ADMS, 5 Oct 1961 [Doc 762 in Histof ADC, Jul-Dec 1961]; Msg WSM 1405, 26 ADMS to USAF, 15 Sep 1961 [Doc 763 in Hist of ADC, Jul-Dec 1961]; IOC, ADCSA-A to ADMME-DB, "Missile/Nuclear Accident Experience 1961," 8 Dec 1961 [Doc 715 in Hist of ADC, Jul-Dec 1961]; IOC, ADCSA-M to Members Missile/Nuclear Safety Council, "Minutes of Missile/Nuclear Safety Council Meeting," 10 Aug 1961 [Doc 588 in Hist of ADC, Jul-Dec 1961].

missile erections, the first an unintentional CIM-10B erection during an FCO check because of a circuitry malfunction, and the second a scheduled erection ending with a damaged CIM-10A. During the episode on 30 January at Langley, the CIM-10B involved, before reaching the height of its involuntary journey (60 to 70 degrees up), knocked over a personnel radiation screen, scooped up cables and other accessories, and broke the chilled water connector and external hydraulic pressure line bracket. To prevent future accidents of this sort when circuitry malfunctions occurred, ADC directed that prior to starting an FCO check, the shelter hydraulic system be inactivated and the pressure reduced to zero. The CIM-10A damage at Langley in August resulted when noseclamp open-limit switches, in the course of a missile erection cycle, failed to operate, causing the missile to strike the erector boom as the boom swung down. A check on 148 other shelters revealed another 16 faulty noseclamp open-limit switches. A new switch was devised to avert future mishaps of this kind. A warhead-equipped CIM-10B undergoing a periodic inspection at the 35th ADMS in June suffered damage to its right elevator and horizontal stabilizer because a control surface lock had not been

previously unfastened as called for. The trouble occurring in September at the 6th ADMS was caused by broken tubing in a CIM-10A that allowed acid to leak from the missile. And near the end of the year, on December 27, a CIM-10B in ready storage at the 46th ADMS (McGuire), with warhead mated, was discovered to have had a squib that accidentally fired, a programming timer that ran down to T minus two seconds, and ammonia that exuded from the missile.[30]

Calendar year 1963 enjoyed considerable relief from nuclear mishaps, experiencing but 14 in all. And most of these were trivial by comparison with the mishaps of former years. The four of most consequence involved: (1) shredded insulation discovered on a warhead detonator cable at the 6th ADMS (Suffolk) on 7 May; (2) ramjet flares that ignited

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30. Msg 22CAS 1-05, 22 ADMS to USAF, 31 Jan 1962; Msg ADMME DC (no #) ADC to 30 AD, et al, 1 Feb 1962 [ADCSA files]; RESTRICTED DATA, Msg CSA-35 62-675, 35 ADMS to USAF, 26 Jun 1962 [DOC 65]; Rpt, OAMA to Dep IG for Safety USAF, "Report of Missile Incident Involving IM-99A, 59-1941, 13 Aug 1962," 18 Dec 1962 [ADCSA files]; Msg 6CSA 1516, 6 ADMS to ADC, 27 Sep 1962 [DOC 66]; Msg 46CSA 1-10, 46 ADMS to USAF, 3 Jan 1962 [DOC 67]; Msg 46CSA 1-21, 46 ADMS to USAF, 4 Jan 1962 [DOC 68]; ADC, Charts and Graphs, ADCSA, "Summaries of 1961-62 Air-to-Air and Ground-to-Air Accidents/ Incidents," n.d. ca. Jan 1963 [Doc 313 in ADC Historical Study No. 20, Nuclear Armament: Its Acquisition, Control and Application to Manned Interceptors 1951-1963].

[redacted]

on CIM-10A (containing a warhead) at this same squadron on 16 June because of a short circuit arising from a corroded electrical connection; (3) two cracks found in the neutron generator of a warhead at the 37th ADMS (Kincheloe) on 9 October resulting from a materiel defect; and (4) leaking ammonia that discolored the warhead of a CIM-10A at the 46th ADMS (McGuire) on 18 November.[31]

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31. RESTRICTED DATA, Msg 6CSA-S82-3, 6 ADMS to NYADS, 8 May 1963 [ADCSA files]; FORMERLY RESTRICTED DATA, Msg 63SAWMT S 20319, SAAMA to DNS (Kirtland), 26 Jul 1963 [ADCSA files]; FORMERLY RESTRICTED DATA, Msg 6CSA-C25-63, 6 ADMS to USAF, 16 Jun 1963 [DOC 69]; RESTRICTED DATA, Msg 37CCR 96/36, 37 ADMS to USAF, 10 Oct 1963 [ADCSA files]; RESTRICTED DATA, Msg 37-MME/QC 103/63, 37 ADMS to OOAMA, 16 Oct 1963 [ADCSA files]; Msg ADMME-EB 5678, ADC to 26 and 30 AD, 21 Nov 1963 [DOC 70].

[redacted]

Summarized in tabular form, the cumulative experience of BOMARC mishaps from 1960 to 1963* involving test missiles without warheads and tactical missiles with warheads, were as follows:[32]

	Materiel Failures	Personnel Errors	Total
1960 (CIM-10A's)	31	17	48
1961 (CIM-10A's and B's)	38	16	54
1962 (CIM-10A's and B's)	11	6	17
1963 (CIM-10A's and B's)	8	6	14

32. RESTRICTED DATA, Rpt, ADC, Proj 10B, "Summary of the ADC Missile/Nuclear Accident Safety Experience for 1960," 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961]; IOC, ADCSA-A to ADMME-DB, "Missile/Nuclear Accident Experience 1961," 8 Dec 1961 [Doc 715 in Hist of ADC, Jul-Dec 1961]; ADC, Charts and Graphs, ADCSA, "Summaries of 1961-62 Air-toAir and Ground-to-Air Accidents/Incidents," n.d. ca. Jan 1963 [Doc 313 in Historical Study No. 20, Nuclear Armament: Its Acquisition, Control and Application to Manned Interceptors 1951-1963]; ADC Chart, ADCSA "BOMARC-Drone Missile Incidetn Summary 1963," as of 12 Dec 1963 [DOC 71].

* Most of the mishaps were incidents, one-time damage reports, and hazardous situations; no mishaps in the more serious accident category occurred during 1962 and 1963, and very few accidents occurred in 1960 and 1961.

[redacted]

GLOSSARY OF TERMS USED IN MILITARY CHARACTERISTICS FOR A 22 INCH OUTSIDE DIAMETER ATOMIC WARHEAD FOR AIR DEFENSE USE

The following terms and definitions thereof, which are in consonance with existing AEC/DOD definitions, are included for clarity of purpose and prevention of misunderstandings.

1. Nuclear System -- That portion of the warhead which provides the nuclear reaction. This system normally consists of all of the nuclear and non-nuclear material contained in the capsule, pit, pit liner, tamper and trap door. Some of the listed items may or may not be used depending on the design.

2. Nuclear Safing System -- That portion of a weapon that integrally contains all the apparatus which, on receipt of proper signals from the arming system or by manual operation, functions so as to place the nuclear system in an armed or safed condition.

3. Implosion System -- That portion of the atomic weapon which provides the compression necessary to cause the nuclear system to function. This system will normally consist of the high explosive, detonators and the necessary structure to combine these parts into an entity.

4. Firing System -- That portion of the weapon which, upon signal from the arming system, transforms, stores, and, upon signal from the fuzing system, discharges this stored electrical energy to detonate the implosion system. This system will normally consist of the firing set, firing switch, load coils, load plates, detonator cables, other interconnecting cables and structures.

5. Warhead -- Includes the nuclear system, nuclear safing system, implosion system, firing system, plus the hardware required to hold these parts together, cabling to interconnect the internal electrical circuits and the necessary electrical connectors to join the warhead systems to the adaption kit. The power supply, derivation of arming and firing signals and special hardware needed to mount the warhead in its compartment are specifically excluded.

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6. Arming System -- That portion of the weapon which derives (originates) the signals required to arm, safe or re-safe the firing system and the fuzing system and to actuate the nuclear safing system. The arming system will normally consist of pullout systems, arming baros or similar components.

7. Fuzing System -- That portion of the weapon which derives the signals which discharge the firing system. This system normally consists of such components as pressure, proximity, time or acceleration sensing elements.

8. Power Supply -- This is the basic source of power which provides the electrical energy needed for the operation of an atomic weapon.

9. Adaption Kit -- Those items peculiar to the warhead installation less the warhead; namely, the arming and fuzing systems, power supply and all hardware, adaptors, etc., required by a particular installation.

10. Warhead Installation -- Consists of the warhead and the adaption kit.

11. Warhead Dud Probability -- The probability that the warhead fails to produce a nuclear detonation after receipt of the proper signals from the adaption kit.

12. Warhead Premature Probability -- The probability of a nuclear detonation prior to receipt of a firing signal from the adaption kit at the intended point along the trajectory of the warhead carrier.

13. Warhead Delay Probability -- The probability of a delayed nuclear detonation after receipt of a firing signal from the adaption kit at the intended point along the trajectory of the warhead carrier.

14. Nuclear Disaster Zone -- That portion of a missile trajectory below the safe burst height, including both the location of the launcher and any possible point of ground impact.

15. Safe Burst Height -- That height, above which, if a nuclear explosion occurs, only an acceptable degree of damage will occur to ground installations.

16. Warhead Functional Readiness Condition -- That condition of the warhead requiring only vacuum tube warmup time to use it in combat.

WEAPON PERFORMANCE CHARACTERISTICS

	BOMARC CIM-10A	BOMARC CIM-10B
Boost Propulsion	40 sec-thrust integral liquid rocket motor. 35,000 lb thrust at sea level.	25 sec-thrust integral solid rocket motor. 50,000 lb thrust at sea level.
Cruise Propulsion	Twin Ramjets. 0 thrust at sea level. 3,000 lb thrust at 65,000 ft.	Twin Ramjets. 4,000 lb thrust at sea level.
Cruise Altitude	65,000 ft.	71,000 ft.
Cruise Speed	Mach 2.6	Mach 2.7
Maximum Intercept Altitude	65,000 ft.	82,000 ft.
Minimum Intercept Altitude	10,000 ft.	0 ft.
Tactical Range	230 NM.	420 NM (High alt) 280 NM (Low alt)
Warhead	Nuclear, proximity fuse detonation	Nuclear, proximity fuse detonation.
"G" Limits	1.5 - 7.5 Mid-course 3.0 - 7.5 dive	1.5 - 7.5 Mid-course 3.0 - 7.5 dive
Reaction Time	1 min. 30 sec. warm-up, 30 sec. launch cycle.	30 sec. warm-up and launch cycle.

[redacted]

	BOMARC CIM-10A	BOMARC CIM-10B
Guidance		
- Initial	Internal pre-set; gimbaled booster.	Internal pre-set; booster exhaust deflection vanes.
- Mid-course	Special GAT radio. Command Data Link.	SAGE radio. Data Link system.
- Terminal	Active pulse-type homing radar.	Active pulse-doppler homing radar.
Influence Fuse Range	400 ft.	3,000 ft.

The CIM-10 (BOMARC) is a pilotless, all-weather, supersonic, Boeing long range interceptor missile. Two models of the BOMARC are produced, the CIM-10A and CIM-10B. The CIM-10A contains a liquid rocket booster, while the CIM-10B has a solid propellant boost system. The characteristics of propellants and missile design changes result in differences of speed, range and altitude and, consequently, necessitate changes in operational and supply procedures affecting the training, manpower and organization and installation of requirements. A CIM-10B site will have 28 launcher shelters for each 29 missiles; however, Niagara will be augmented with an additional 20 missiles and 20 launcher shelters for a full complement of 49 missiles and 48 launcher shelters.

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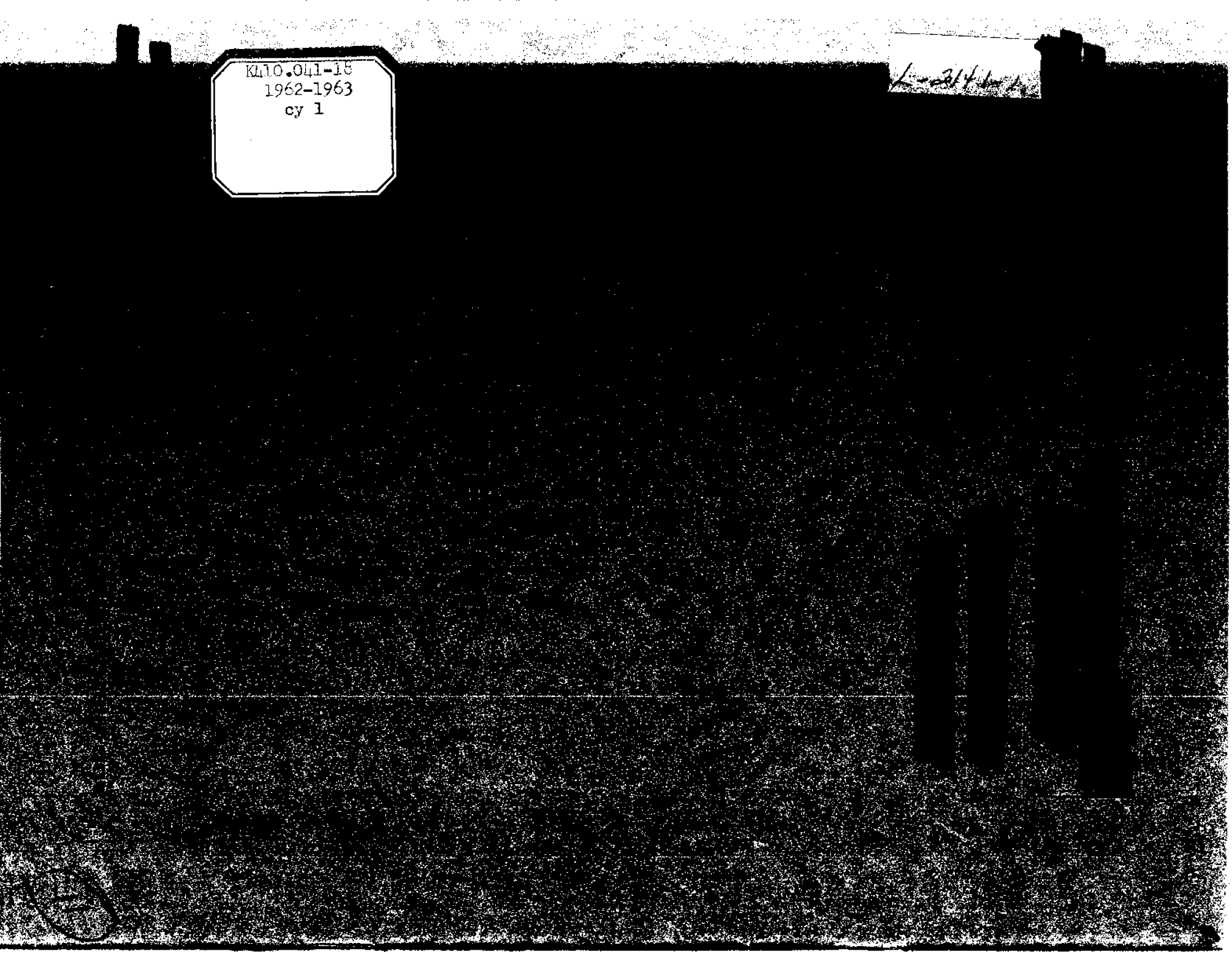

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USAF

BOMARC IM-99A IN FIRING POSITION

ADC HISTORICAL STUDY NO. 18

[redacted]

INTERCEPTOR MISSILES

1962-1963

by RICHARD F. Mc MULLEN

REDACTED

[redacted]

[redacted]

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INTERCEPTOR MISSILES, 1962-1963

SUMMARY

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

DOE (b)(3)

In 1955 ADC had planned to deploy 4,800 BOMARC missiles at 40 sites around the eastern, northern and western borders of the United States. The eight sites finally built in the northeastern quadrant were equipped with 347 missiles (174 of the early IM-99A model and 170 of the longer-range IM-99B) as of late August 1963. The total number of missiles

[redacted]

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

DOE (b)(3)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

Since the BOMARC became fully operational at the prescribed eight U.S. sites in 1962, it might have been logical to assume that testing of the missile had been completed at that time, but such was not the case. To be sure, all testing of the IM-99A and Category II testing of the IM-99B was completed in 1962, but Category III testing of the IM-99B continued until August 1963.* Test activity was much diminished in 1962 and 1963 in comparison with 1961. While 61 test missiles were launched in 1961, only 19 were sent aloft in 1962, and only seven in 1963.

The rapidity with which air defense weapons became obsolescent was graphically demonstrated in August 1963. On 19 August the BOMARC test program was completed with the

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

DOE (b)(3)

* Category I testing was primarily a contractor effort under the supervision of AFSC. Category II testing was, in a sense, acceptance testing, primarily an AFSC effort with assistance from the contractor. Category III was intended to indicate how the weapon would operate in a normal tactical squadron environment. It was primarily an ADC effort with assistance from AFSC and the contractor. During Category I and II testing the Joint BOMARC Test Organization (JBTO) was supervised by AFSC. During Category III the JBTO was an ADC unit.

[redacted]

launching of the final IM-99B Category test missile. Two days later, 21 August, USAF announced that the Secretary of the Air Force had forwarded to the Department of Defense on 8 July a USAF recommendation the IM-99A be phased out of the USAF missile inventory during Fiscal 1965. USAF added, on the strength of expected DOD approval, that valuable operating funds could be saved by commencing phase-out actions in Fiscal 1964. Department of Defense approval was obtained by the end of August and USAF directed ADC to provide, by 1 October 1963, a detailed plan for disposition of the IM-99A.[2] The first IM-99A missile had been declared operational on 1 September 1959.

IM-99A TESTING

The last three missiles allotted to the IM-99A test program were launched during the first half of 1962. One of these was the often-postponed demonstration of the capability of the IM-99A against the GAM-77 (Hound Dog) air-to-surface missile carried by B-52 bombers.

Only the first of the three 1962 launchings of the IM-99A could be regarded as successful. On 1 February an

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2. Msg AFXOPN 88661, USAF to ADC, 21 Aug 1963 [DOC 2]; Msg ADOOP-WM 3012, ADC to CONAD, 23 Aug 1963 [DOC 3]; Msg AFOAPD 90654, USAF to ADC, 29 Aug 1963 [DOC 4].

IM-99A was sent against an unaugmented QF-104 drone maneuvering at an altitude of 35,000 feet and at a speed of 1.15 Mach. In this instance the test missile made a direct hit at a range of 120 miles. At this point a long series of delays prevented the launching of the second test missile. Between 1 February and early May 1962, eight attempts were made to launch the last of the Category III missiles, but three times the weather interfered, three times the target drone developed mechanical or control problems, once there was a conflict with an IM-99B launching and once the missile control frequency encountered interference from an unknown source. Finally, the missile was launched on 10 May. Again the target was a QF-104 drone, this time at an altitude of 20,000 feet and a speed of 1.08 Mach. But because of malfunctions within the flight control system, the missile missed the target by 1,700 feet. At this distance the proximity fuze would not react.[3]

3. [redacted], Msg 4751CCR 2-044, Eglin Test Br to AFSC, 8 Feb 1962 [DOC 5]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 28 Febeuary 1962," 13 Mar 1962 [DOC 6]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 Mar 1962," 13 Apr 1962 [DOC 7]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 April 1962," 10 May 1962 [DOC 8]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 31 May 1962," 11 Jun 1962 [DOC 9].

It was originally intended, when the matter of a GAM-77/BOMARC demonstration was first broached by USAF in December 1961, that the IM-99B would be used. So many difficulties were currently being experienced with the IM-99B, however, that it was decided in early 1962 that the IM-99A would be utilized in the demonstration.

Various attempts were made to conduct the GAM-77/BOMARC demonstration in April, May and early June of 1962, but malfunctions in the IM-99A and its control system and recurring problems affecting Hound Dog missiles prevented the actual test. Both weapons systems were never ready at the same time until 27 June when the IM-99A missile set aside for the demonstration was finally launched. The BOMARC reached its preliminary altitude of 69,000 feet without difficulty, but a power failure during the mid-course phase of flight made it necessary to destroy the missile after it was airborne only 306 seconds and long before it reached the area where the Hound Dog was to be encountered. This, of course, was not a valid demonstration of the capability of the IM-99A against the GAM-77. There was little possibility of rescheduling the GAM-77/BOMARC demonstration, because the failed IM-99A missile was the last of those scheduled for

test use. In the test series which extended back to September 1952, the test organization had launched 134 IM-99A missiles.

IM-99B TESTING

The test program for the IM-99B ended 1961 on a note of frustration. Three of the last four missiles launched in 1961 failed to complete the mission because of a perplexing series of control system malfunctions. The IM-99B launched 17 October 1961 rolled abnormally during the early stages of flight and crashed 12 miles from the launcher. The mission of 21 November failed when the flight control system directed the missile to engage in such violent maneuvers that it disintegrated at 30,000 feet. On 13 December the test missile rose to 71,000 feet, transitioned to level flight, then went into a series of rolls that ended with an uncontrolled dive into the Gulf. None of the malfunctions followed a pattern that gave test personnel a good clue as to the specific

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4. 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 April 1962," 10 May 1962 [DOC 8]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 31 May 1962," 11 Jun 1962 [DOC 9]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 30 June 1962," 11 Jul 1962 [DOC 10]; Msg 4751 ODC-TI-013, 4751 AD Wg to ADC, 3 Jan 1962 [DOC 11]; Msg ADOOP-WM 101, ADC to 4751 AD Wg, 12 Jan 1962 [DOC 12]; Msg SCSAD-23-1-37, AFSC to SAC, 23 Jan 1962 [DOC 13]; Msg AFORQ-AD 95075, USAF to AFSC, 23 Jan 1962 [DOC 14]; Msg ASZDBT-20-2-51, ASD to IM-99B Field Test Br, 20 Feb 1962 [DOC 15].

problem. All that could be said was that the control system, in general, was not working as it should. Also, the test program was behind schedule at the end of 1961. Earlier schedules had called for the completion of Category II testing of the IM-99B in 1961. At the end of the year, however, five Category II test missiles remained to be launched. In addition, 18 Category III launches were expected in 1962.

Category II testing of the IM-99B was completed in May 1962, but seven Category III missiles still remained to be launched in 1963, although the schedule in effect at the beginning of 1962 called for the completion of all BOMARC testing by 1 November of that year. In all, 16 IM-99B test missiles were launched in 1962, an average of slightly more than one a month.

The test organization attacked the problem of flight control anomalies by requiring more stringent pre-launch inspection of test missiles. And in the face of three successful test missions (all Category II) during the first three months of 1962, it appeared that this approach to flight control problems had been appropriate. On 31 January 1962 a test IM-99B was launched at an augmented QF-104 flying at Mach 1.2 at an altitude of 35,000 feet and a range of 125

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5. Hist of ADC, Jul-Dec 1961, pp. 231-32.

miles. The missile passed within 25-50 feet of the target. This mission was also noteworthy in that it marked the first flight of the re-designed (ECP 2200) target seeker. A week later, on 7 February, a test missile made a direct hit on a maneuvering QB-47 target fitted with ECM gear. This target was subsonic, flying at Mach .75. Target altitude was 35,000 feet and range was 257 miles. On 21 March 1962, the IM-99B was successful against a much more difficult target -- an unaugmented and maneuvering QF-104 flying at Mach 1.2 in an ECM environment. The test missile passed close enough to the target that the fuze fired. Altitude was 35,000 feet and range was 224 miles.[6]

It was a somewhat different story, however, when the first of the 1962 Category III missiles was launched on 23 March 1962. A power failure which occurred when the missile reached its high cruise altitude (73,000 feet) threw it into such violent maneuvers that the missile broke apart. A similar situation resulted when the next IM-99B missile was launched on 8 April. The mission was a failure

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6. [redacted]A, Msg ASZDBF-ME 1-21, Eglin Test Br to AFSC, 3 Feb 1962 [DOC 16]; 4751 AD Wg to ADC, "Status of BOMARC Test Program as of 28 February 1962," 13 Mar 1962 [DOC 6]; Msg ASZDBF-ME 22-3-22, Eglin Test Br to USAF, 23 Mar 1962 [DOC 17]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 March 1962," 13 Apr 1962 [DOC 7].

because the target seeker and fuze system apparently called for so much electrical power that the power system failed again.[7]

Because both the missions of 23 March and 8 April failed as the result of in-flight malfunctions in the electrical power system, the test organization halted testing on 11 April to permit Boeing to look into the problem. Boeing devised a series of 17 tests it conducted on a ground test missile located in Seattle, but concluded that no particular subsystem or combination of subsystems was at fault. Boeing merely recommended that missile handling techniques be reviewed and that subsequent test missiles be fitted with special telemetry equipment to check the in-flight operation of the high voltage power supply system. Boeing also recommended that test launchings be resumed.[8]

The 20th, and last, missile in the IM-99B Category II test series was therefore launched 16 May 1962. Whether or not the electrical power system would have acted properly

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7. Msg ASZDBF-ME 24-3-23, Eglin Test Br to USAF, 26 Mar 1962 [DOC 18]; Msg ASXDBR-ME 30-3-27, Eglin Test Br to ADC, 31 Mar 1962 [DOC 19]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 March 1962," 13 Apr 1962 [DOC 7]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 April 1962," 10 May 1962 [DOC 8].

8. 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 30 April 1962," 10 May 1962 [DOC 8].

was not determined, because the control system put the missile into such a steep climb that the ramjet engines "blew out" only 34 miles from the launch site. Category II testing thereby ended on a negative note.[9]

At this point, ADC became concerned over the slow rate of IM-99B testing. Only six test missiles had been launched during the first five months of 1962, a rate that would definitely preclude completion of IM-99B testing by the scheduled date of 1 November 1962. Part of the delay, ADC contended, lay in the low priority given the IM-99B test program by the Gulf Test Range. ADC pointed out that the shortage of drones and the infrequency of the periods the range was available for IM-99B launches were both factors in the delays being experienced. AFSC responded promptly with promises that these problems would be corrected and ADC was satisfied with the AFSC response.[10]

As a result of the ADC complaint and subsequent AFSC action, four test missiles were launched in June 1962. Only one of the four successfully completed a mission, however.

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9. [redacted], Msg ASXDBF-ME 18-5-23, Eglin Test Br to USAF, 20 May 1962 [DOC 20]; 4751 AD Wg to ADC, "Status of the BOMARC Test Program as of 31 May 1962," 11 Jun 1962 [DOC 9].

10. Msg ADCCS 1422, ADC to 32 AD, 24 May 1962 [DOC 21]; Msg SCSAD 19-6-41, AFSC to ASD, 19 Jun 1962 [DOC 22].

This was the first of the June launchings, accomplished on 5 June. On this occasion, the test missile intercepted a maneuvering QB-47 flying at Mach .75 at a range of 250 miles and an altitude of 35,000 feet. The missile passed within 58 feet of the target and the fuze fired. No power system malfunctions were noted. The remainder of the June launchings were failures. The missile launched 14 June encountered a malfunction in the variable frequency oscillator. As a result the target seeker never had a chance of acquiring the target. The mission of 27 June was a failure because the missile was given incorrect commands and never reached the target area. Also, the test missile was destroyed 11 seconds before the programmed time of interception. Destruction was not ordered from the ground, so the test organization was at somewhat of a loss as to why it occurred, although some malfunction in the electrical system was suspected. The following day, 28 June, the test missile did not intercept the target QF-104 because of erratic operation of the target seeker.[11]

11. [redacted], Msg ASZDBF-ME 766, Eglin Test Br to ADC, 8 Jun 1962 [DOC 23]; [redacted], Msg ASXDBF-ME 15-6-10, Eglin Test Br to USAF, 16 Jun 1962 [DOC 24]; [redacted], Msg ASXDBF-ME 29617, Eglin Test Br to SAGE Proj Off (New York), 30 Jun 1962 [DOC 25]; [redacted], Msg ASZDBF 29615, Eglin Test Br to ADC, 1 Jul 1962 [DOC 26].

It was again obvious, as it had been in April 1962, that something was radically wrong with the electrical system of the IM-99B, especially as it affected the target seeker. A concentrated effort to run down the source of these problems was made in late June and July. All target seekers were recycled through the Westinghouse plant in Baltimore to make sure that they met manufacturing specifications. Three missiles were sent back to the Boeing plant in Seattle for the same reason. The Mobile Inspection Units (MIU) were throughly examined in an attempt to discover why missiles were able to pass the MIU ground test but fail in flight. This intensive investigation of the causes of test failures made it impossible to accomplish any test launches between 28 June and 10 August 1962 and made it increasingly unlikely that the BOMARC test program would be completed by 1 November 1962.[12]

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12. Msg ASZDB 6-7-14, ASD to AFPRO Boeing (Seattle), 6 Jul 1962 [DOC 27]; Msg MOB-PO 7-5, Eglin Test Br to ADC, 10 Jul 1962 [DOC 28]; Msg MOB-P 1-7-14, Eglin Test Br to ASD, 17 Jul 1962 [DOC 29]; Msg MOB-P 23-7-21, Eglin Test Br to ADC, 23 Jul 1962 [DOC 30]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 30 Jun 1962," 11 Jul 1962 [DOC 10]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 July 1962," 10 Aug 1962 [DOC 31]; Msg ADOOP-WM 1922, ADC to Air Divs, 18 Jul 1962 [DOC 32]; Msg ADOOP-WM 1988, ADC to ASD, 26 Jul 1962 [DOC 33].

After the extensive effort devoted to investigation of quality control procedures, the failure of the 10 August mission was a particular disappointment. The target on this occasion was especially difficult, however, being a maneuvering, unaugmented QF-104 at a range of 224 miles, an altitude of 48,000 feet and a speed of 1.2 Mach. At any rate, although the missile detected the target at a range of 17 miles, the interception was not completed. The missile was launched on a course so far to the right of the course of the target that it was not possible to make corrections rapidly enough to give the target seeker a really good chance to acquire the target.[13]

Because the time remaining before the 1 November deadline for the completion of testing was growing short, Headquarters ADC, in August 1962, assumed direct control of the Category III test effort. No test missions were to be flown without ADC approval. Launches for the sole purpose of checking SAGE performance were to be halted. No missions were to be flown where the chance of success was less than 95 per cent. A second missile processing crew was to be established and every effort was to be made to have a back-up missile ready for launching whenever a malfunction developed

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13. [redacted], Msg MOBE 14811, Eglin Test Br to ADC, 15 Aug 1962 [DOC 34].

in the primary missile. Later in August, four acceptable test mission profiles were established by ADC:

(1) QB-47 target, head-on at an altitude of 35,000 feet.

(2) QB-47 target at 35,000 feet turning 27 degrees 40 seconds before the missile began its transition from high search altitude (approximately 70,000 feet) to low search altitude (40,000 feet).

(3) QF-104 target, augmented with a nine-inch Luneberg lens, head-on at 35,000 feet.

When the IM-99B had progressively scored successes in connection with the first three missions it was to be permitted to attempt the interception of an unaugmented QF-104 in a head-on attack at 48,000 feet. Theoretically, the chance of success of the first three missions was 99 per cent. The probability of success of Mission 4 was figured at 90 per cent. Meanwhile, although AFSC approved of the measures being taken by ADC to expedite completion of BOMARC testing, the unreality of the 1 November deadline had become manifest. On 28 August 1962, AFSC extended the test deadline to 1 January 1963.[14]

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14. Msg ADODC 2231, ADC to MOADS, 23 Aug 1962 [DOC 35]; Msg ADODC 2329, ADC to ASD, 31 Aug 1962 [DOC 36]; Msg SCSE 28-8-119, AFSC to ASD, 28 Aug 1962 [DOC 37].

The interim test program outlined by ADC in August 1962 was generally accomplished in five IM-99B test mission flown between 31 August and 17 October. On 31 August the test missile made a direct hit on a non-maneuvering QB-47 target at a range of 250 miles and an altitude of 35,000 feet. The program called for a second mission against the QB-47, but since none of the subsonic targets were available, the launching of 13 September involved an augmented an non-maneuvering QF-104 at 35,000 feet. On this occasion, however, the missile overshot the target because of the failure of the microwave oscillator in the target seeker. This mission was re-run on 27 September, but apparent success (the missile passed within 25-35 feet of the target was turned to failure when the fuze failed to fire.[15]

ADC was "gravely concerned" over the two consecutive failures to intercept the relatively uncomplicated target presented by the augmented and non-maneuvering QF-104,

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15. [redacted], Msg MOBE 31830, Eglin Test Br to AFSWC, 1 Sep 1962 [DOC 38]; Msg MOBE 6936, Eglin Test Br to ADC, 7 Sep 1962 [DOC 39]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 August 1962," 14 Sep 1962 [DOC 40]; [redacted], Msg MOBE 14-47, Eglin Test Br to ASD, 15 Sep 1962 [DOC 41]; [redacted] Msg 17-9-49, Eglin Test Br to ADC, 18 Sep 1962 [DOC 42]; [redacted] Msg PGYI 27-9-153, APGC to USAF, 27 Sep 1962 [DOC 43]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 30 September 1962," 12 Oct 1962 [DOC 44].

especially in light of the failure of the fuze to operate properly during the second mission. On the third attempt, however, this particular mission was successful. The missile, launched 4 October 1962, made a direct hit on the target at a range of 225 miles. The test organization was therefore free to send the IM-99B against an unaugmented, but non-maneuvering, QF-104 at an altitude of 48,000 feet. This was done on 17 October 1962. Again, despite the smallness of the target, the mission was a complete success. The missile passed within eight feet of the target and the fuze fired.[16]

Although it had not been planned that way, 1962 testing of the IM-99B ended at that point. The difficulty over Cuba erupted at that time and the SAGE center at Montgomery, Alabama, was required in active air defense. The emergency ended in early December and eight test missions were scheduled during the latter half of that month, but no missiles were actually launched. At the test deadline of 1 January 1963, therefore, seven Category III missiles

16. Msg ADODC 2673, ADC to ASD, 5 Oct 1962 [DOC 45]; [redacted], Msg PGYI 17-10-160, APGC to USAF, 17 Oct 1962 [DOC 46]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 October 1962," 14 Nov 1962 [DOC 47].

remained in the test inventory.[17] The test deadline was extended to 31 March 1963.

In January 1963, after a hiatus of two-and-a-half months, test launchings were resumed and long-delayed BOMARC/ALRI testing was begun. ALRI (Airborne Long Range Input) was an airborne radar platform expected, among other things, to make possible the use of the IM-99B at extremely low altitudes. The ALRI modification had been completed on selected RC-121 aircraft of the AEW&C (Airborne Early Warning and Control) fleet and the time had come to see whether or not the ALRI equipment could actually direct an IM-99B missile in a mission against a low-flying target.

The initial ALRI test (also the 20th launching in the Category III test series) occurred 2 January 1963. The target was a QB-47 drone flying at an altitude of 500 feet and a speed of 300 knots. The objective of the test was to make a head-on interception of the target at a range of 250 miles. The ALRI aircraft was stationed about 50 miles from the target area at an altitude of 15,000 feet. From an ALRI

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17. Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 October 1962," 14 Nov 1962 [DOC 47]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 30 November 1962," 3 Dec 1962 [DOC 48]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 December 1962," 9 Jan 1963 [DOC 49].

standpoint, the mission was highly successful. The airborne radar acquired the target without difficulty and directed the missile to the target. The action of the missile, however, raised some questions. The missile passed within 2,000-3,000 feet of the target, barely within the lethal envelope of the simulated nuclear blast, and was considered to have successfully intercepted the target. It appeared likely, however, that the fuze had fired as the result of radar reflections from the water rather than reflections from the target, but this phenomenon caused no immediate concern, since it was the first attempt at ALRI/BOMARC collaboration and there was a sense of gratification that ALRI had performed so well.[18]

At this point the BOMARC test organization shifted from simulated combat against a low-altitude subsonic target to testing involving a high-altitude target which increased in speed as it approached the area where interception was planned. On 10 January an IM-99B was launched against a QF-104 target that cruised initially at subsonic speed at an altitude of 35,000 feet. After the missile was launched

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18. [redacted], Msg PGYI 2-1-1, APGC to USAF, 2 Jan 1963 [DOC 50]; [redacted], Msg ADODC 65, 8 Jan 1963 [DOC 51]; [redacted], Msg MOBE 3-1-1, Eglin Test Br to USAF, 4 Jan 1963 [DOC 52].

the target was shifted into high gear until it reached an altitude of 55,000 feet and a speed of 1.6 Mach. Interception was planned at a range of 275 miles.

The interception did not take place, however, because of incompatability between the SAGE control system and the control system in the missile. The Montgomery SAGE Sector had recently been converted to what was known as the Model 9.1 configuration, while the Ground-to-Air Transmitter (GAT) serving the Gulf Test Range was attuned to the earlier SAGE model. In effect, therefore, SAGE was transmitting on one channel while the GAT was receiving on another. As a consequence the GAT was unable to forward mid-course guidance from SAGE to the missile and the missile was destroyed by range safety personnel after it passed well behind the target.

Obviously, testing could not continue so long as there was incompatibility between the SAGE program in effect at Montgomery and the control system utilized in BOMARC testing. The test program was therefore delayed nearly a month while the Electronic Systems Division (ESD) and the

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19. [redacted], Msg PGYI 10-1-3, APGC to USAF, 10 Jan 1963 [DOC 53]; [redacted], Msg MOBE 11-1-5, Eglin Test Br to USAF, 14 Jan 1963 [DOC 54]; [redacted], Msg MOBE 15-1-7, Eglin Test Br to USAF, 16 Jan 1963 [DOC 55]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 January 1963," 15 Feb 1963 [DOC 56].

Aeronautical Systems Division (ASD) of AFSC, Boeing and ADC's Computer Programming and Systems Training Office (APASTO) worked to iron out the serious differences revealed during the test mission of 10 January. Although the compatibility problem was not immediately solved, sufficient progress had been made by early February 1963 that it was believed possible to proceed with the Category III IM-99B test program, already months behind schedule.[20]

On 8 February the mission of 10 January was repeated. Again the missile failed to make the planned interception, although the reason for failure was almost totally unexpected. In this instance the QF-104 target responded to an unexplained signal which caused it to zoom prematurely to an altitude of 52,000 feet and then stall. The target seeker of the missile could not detect the target because of the unfavorable missile-to-target geometry. While the test mission was unsuccessful, there was no hint of incompatibility between SAGE and the IM-99B control system.[21]

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20. Msg ADOOP-EO 412, ADC to ADC Computer Programming and Systems Training Office (APASTO-Santa Monica), 7 Feb 1963 [DOC 57]; Msg ADOOP-EO 413, ADC to APASTO, 7 Feb 1963 [DOC 58]; Msg ADOOP-EO 414, ADC to APASTO, 7 Feb 1963 [DOC 59].

21. [redacted] Msg PGYI 8-2-9, APGC to USAF, 8 Feb 1963 [DOC 60]; S[redacted], Msg MOBE 12-2-21, Eglin Test Br to USAF, 12 Feb 1963 [DOC 61].

Five days later, 13 February, the test organization made a third attempt to intercept the relatively sophisticated target represented by an accelerating, high-altitude QF-104. This time everything went according to plan, except that the interception was made at the shorter range of 240 miles because the drone encountered high headwinds. SAGE positioned the missile correctly, the QF-104 did what was expected of it and all subsystems of the missile, including the target seeker and fuze, operated properly. This was the 23rd launching of the Category III test series.

The following day, the test organization returned to the low-altitude BOMARC/ALRI program involving a low (500 feet), slow (300 knots) QB-47. Again the ALRI equipment worked well, as it had during the initial ALRI mission of 2 January, but again there was trouble during the terminal phase of the interception when the target seeker had difficulty maintaining contact with the target at extremely low altitude, apparently because it was confused by radar reflections from the surface of the water. While the mission of 2 January was considered a qualified success since the

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22. [redacted], Msg PGYI 13-2-11, APGC to USAF, 13 Feb 1963 [DOC 62]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 28 February 1963," 12 Mar 1963 [DOC 63].

missile passed within lethal range of the target, the mission of 14 February had to be classed as a failure because the missile missed the target by a much wider margin.

The similarity in the performance of the target seekers during the 500-foot missions of 2 January and 14 February 1963, as well as parallel performance during a 1,500-foot Category I mission of 14 April 1961, raised the possibility that the target seeker of the IM-99B was incapable of adequate low-altitude work. A design deficiency was indicated. On 21 February 1963, therefore, ADC concurred in a MOADS recommendation that Category III launchings be suspended until the available data on the low-altitude problems of the target seeker could be further evaluated. Only two test missiles remained in the Category III test inventory and it was thought wise to hold these for use in testing an improved target seeker should the development agencies decide that a redesigned target seeker was required.[24]

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23. [redacted]RN, Msg PGYI 14-2-12, APGC to USAF, 14 Feb 1963 [DOC 64]; [redacted], Msg MOBE 12-2-24, Eglin Test Br to USAF, 15 Feb 1963 [DOC 65]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 28 February 1963," 12 Mar 1963 [DOC 64].

24. Msg MOB 15-2-23, Eglin Test Br to ASD, 15 Feb 1963 [DOC 66]; Msg MOB 20-2-25, Eglin Test Br to ASD, 20 Feb 1963 [DOC 67]; Msg ADODC 558, ADC to MOADS, 21 Feb 1963 [DOC 68].

Before technical work on a "fix" could be started, it was necessary to define the problem in detail. Therefore, representatives of Boeing, Westinghouse (manufacturer of the target seeker), the Joint BOMARC Test Organization (JBTO) and ASD met 1 March 1963 and decided that investigation of the target weeker would have to continue to determine exactly what energy was received by the target seeker during a low-altitude mission and exactly how the target seeker reacted to it. It was not considered necessary to launch further IM-99B missiles in order to define the problem, since experience in the development of the ASG-18 fire control system (originally intended for the F-108) would probably provide sufficient information. According to the tentative schedule established during the conference of 1 March, ASD would approve the "fix" technique established by Boeing and Westinghouse by 20 March. The improved target seeker would be installed in the two remaining Category III test missiles by 15 April and the first of the two missiles would be launched by 22 April. Meanwhile, the date for completion of Category III

testing of the IM-99B was extended from 31 March to 31 May 1963.[25]

At a subsequent meeting of 18-19 March, correction of the target seeker difficulty appeared to be proceeding according to plan. Boeing and Westinghouse proposed technical improvements that appeared satisfactory to ASD, so the plan to launch the first missile with the improved target seeker on 22 April was confirmed. By early April, however, doubts as to the adequacy of the proposed improvements began to be expressed. While ASD was convinced that the addition of an offset filter and "sawtooth" sweep would improve the low-altitude capability of the target seeker, there was concern that a third improvement -- continuous pulse recurrence frequency (PRF) switching -- might produce side effects that would degrade the total capability of the target seeker. On 5 April 1963, ASD decided to proceed with the incorporation of the first two changes in the test missiles, but continue the investigation of continuous PRF switching in an effort to determine whether or not the same effect could be produced by some other means. As a consequence, the date for the launching of the first test missile

25. Msg ASZDB 6-3-7, ASD to AF Plant Rep (Boeing), 6 Mar 1963 [DOC 69]; Msg ASZDB 8-3-10, ASD to AF Plant Rep (Boeing), 9 Mar 1963 [DOC 70]; Msg ADOOP-WM 800, ADC to ASD, 18 Mar 1963 [DOC 71].

containing the redesigned target seeker was postponed to the first week of May.[26]

But despite best-laid plans, the engineering of the required improvements in the target seeker consumed the remainder of April, all of May and most of June. Unfortunately, Boeing and Westinghouse developed conflicting data in simulated operations with the redesigned target seeker and it was necessary to recheck all aspects of the improvement program. For that reason the date of 31 May 1963 for completion of Category III testing was also unrealistic and a new date of 30 September 1963 was established.[27]

Finally, after four-and-one-half months were consumed in an attempt to provide a target seeker that would be adequate at low altitudes, the next-to-last IM-99B test missile was launched 27 June. Again the target was a QB-47 flying at 500 feet above the surface of the Gulf and at a speed of

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26. Msg ASZDB 22-3-23, ASD to JBTO, 22 Mar 1963 [DOC 72]; Msg ASZDB 9-4-7, ASD to JBTO, 9 Apr 1963 [DOC 73]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 Mar 1963," 12 Apr 1963 [DOC 74].

27. Msg ADODC 1941, ADC to USAF, 24 May 1963 [DOC 75]; Msg ADODC 1953, ADC to 26 AD, 24 May 1963 [DOC 76]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 30 April 1963," 15 May 1963 [DOC 77]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 May 1963," 15 Jun 1963 [DOC 78].

325 knots. Interception was planned at a range of 85 miles. ALRI was utilized in positioning the missile. Whether or not the mission was a success became a matter of debate. While SAGE and ALRI cooperated efficiently in positioning the missile, the operation of the modified target seeker was the subject of some differences of opinion. The missile was 1850 feet from the target when the fuze fired and would have theoretically killed the target. Therefore, Boeing concluded that the modified target seeker had performed satisfactorily. On the other hand, the Eglin Test Branch contended that not much had changed. While admitting that the modified target seeker was an improvement over the earlier version, the Test Branch was of the opinion that the image problem still remained. During the final phase of the interception the target seeker first locked on the target's reflection on the water, then on the target, then back to the reflection, making the transfer several times before the missile finally hit the Gulf.[28]

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28. [redacted], Msg PGYI 27-6-19, APGC to USAF, 27 Jun 1963 [DOC 79]; [redacted], Msg MOBE 28-6-10, Eglin Test Br to USAF, 28 Jun 1963 [DOC 80]; Msg MOB 5-7-2, Eglin Test Br to MOADS, 5 Jul 1963 [DOC 81]; Msg ADOOP-WM 2642, ADC to JBTO, 9 Jul 1963 [DOC 82]; [redacted], Msg AFPRO (Boeing) to ASD, 10 Jul 1963 [DOC 83].

While there was talk, during July, of raising the test altitude from 500 to 1,500 feet in order to provide better information on the target seeker's proclivity to lock-on images reflected from the water (since the target and the image would be further apart), the final Category III test missile, launched 19 August 1963, again undertook to intercept a QB-47 at 500 feet. As before, SAGE and ALRI performed satisfactorily. The missile apparently hit the water near the planned point of interception, but detailed analysis of the performance of the modified target seeker was not immediately available.[29]

Sixteen test missiles were launched in 1962 and seven in 1963 to complete the IM-99B test program. Five of these were Category II shots (Category II testing ended in May 1962), with the remainder falling into Category III. During the 11-year test program which began in September 1952 and ended in August 1963, a total of 213 test missiles (134 IM-99A and 79 IM-99B) were launched.

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29. Msg MOB 5-7-2, Eglin Test Br to MOADS, 5 Jul 1963 [DOC 81]; Msg ADOOP-WM 2642, ADC to JBTO, 9 Jul 1963 [DOC 82]; [redacted] Msg PGYI MOBI 19-8-29, APGC to USAF, 19 Aug 1963]DOC 84].

BOMARC TESTING BEYOND CATEGORY III

Although the date for the completion of formal testing of the BOMARC had been shoved back a number of times, it was obvious in late 1962 that the end was near. It was time for decision as to the future status of the Hurlburt/Santa Rosa test facility. Three possibilities were considered. The test equipment could be "pickled" and re-opened every 18 months for test launches designed to proof test missile/SAGE modifications and provide confidence in the tactical BOMARC system as deployed around the northeastern United States. Conversion of the test facility to tactical configuration, thus providing a ninth tactical site within the United States, was also possible. Finally, it was possible to retain Hurlburt/Santa Rosa in its current status, but on a much reduced scale, to launch perhaps one missile a month. Continuing proof and confidence testing could be conducted in this manner and tactical units could be brought to the Gulf Test Range approximately once a year to maintain their proficiency through actual launch of a missile.[30]

The "pickling" proposal would save money, since it was determined that 174 people would be required to maintain

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30. Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 October 1962," 14 Nov 1963 [DOC 47].

the test facility on a "one-launch-a-month" basis. Also, there was logic in conversion of Hurlburt/Santa Rosa to tactical configuration in view of the threat posed by Cuba, only 90 miles off the Florida coast. In the final analysis, however, it was decided in December 1962 that most would be gained by retaining the test complex as a continuing entity, with tactical BOMARC squadrons alternating in the launching of one missile a month, beginning in April 1963. This program would eventually lessen total BOMARC combat capability in that it would be necessary to begin removing IM-99B missiles from tactical shelters beginning in Fiscal 1965 and from IM-99A sites in Fiscal 1966. ADC, however, believed that gains in the way of proof testing and training would outweigh the risk involved. Furthermore, ADC promised to re-evaluate the risk before emptying any tactical shelters.

As of the end of 1962, the schedule for the first 15 months of post-Category III test and training program was as follows:[32]

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31. [redacted], Msg ADCCS 3405, ADC to APGC, 8 Dec 1962 [DOC 85]; [redacted], Msg ADODC 3557, ADC to USAF, 28 Dec 1962 [DOC 86]; Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 December 1962," 9 Jan 1963 [DOC 49].

32. Det 1, MOADS to ADC, "Status of the BOMARC Test Program as of 31 December 1962," 9 Jan 1963 [DOC 49].

Date	Unit	Missile	Base
April 1963	22 ADMS	IM-99A	Langley
May 1963	26 ADMS	IM-99A	Otis
June 1963	37 ADMS	IM-99B	Kincheloe
July 1963	46 ADMS	IM-99A	McGuire
August 1963	30 ADMS	IM-99A	Dow
September 1963	22 ADMS	IM-99B	Langley
October 1963	26 ADMS	IM-99B	Otis
November 1963	35 ADMS	IM-99B	Niagara
December 1963	6 ADMS	IM-99A	Suffolk
January 1964	74 ADMS	IM-99B	Duluth
February 1964	46 ADMS	IM-99B	McGuire
March 1964	22 ADMS	IM-99A	Langley
April 1964	26 ADMS	IM-99A	Otis
May 1964	37 ADMS	IM-99B	Kincheloe
June 1964	46 ADMS	IM-99B	McGuire

The program outlined in late 1962 did not take effect, however. First, the extension of the IM-99 Category III test series to August 1963 made impossible the commencement of training launches in April 1963 as planned. Then, also in August, came the announcement of the proposed phase-out of the IM-99A in Fiscal 1965. There was obviously little to be gained in testing the proficiency of launching crews assigned to a weapon soon to leave the inventory of active weapons, so the IM-99A portion of the training program was a dead letter. As of August 1963, therefore, the shape of the post-Category III test and training program was unknown, although ADC still planned to proceed with advanced BOMARC testing and training in one form or another.

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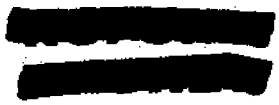

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ADC HISTORICAL STUDY NO. 20

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NUCLEAR ARMAMENT

ITS ACQUISITION, CONTROL AND APPLICATION TO MANNED INTERCEPTORS

1951-1963

[redacted]

THOMAS W. RAY

[redacted]

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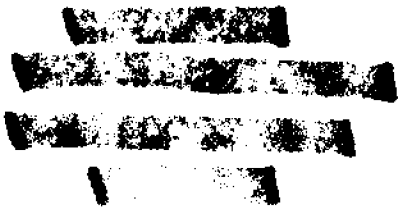

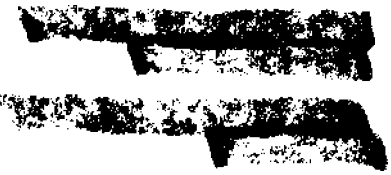

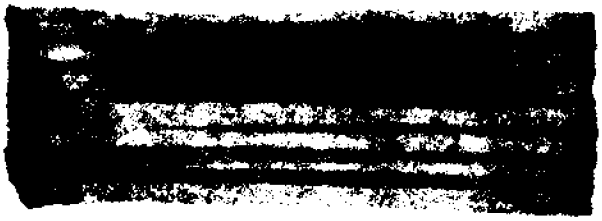

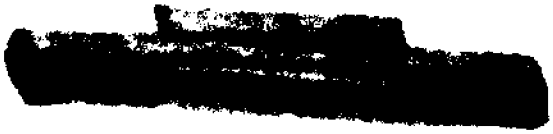

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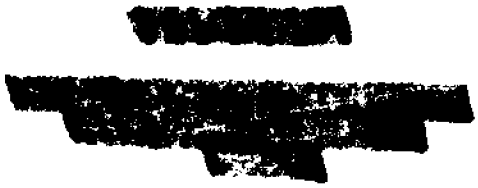

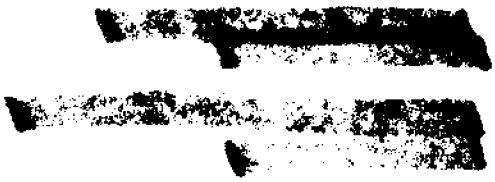

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ADC HISTORICAL STUDY NO. 20

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NUCLEAR ARMAMENT

ITS ACQUISITION, CONTROL AND APPLICATION TO MANNED INTERCEPTORS 1951-1963

by THOMAS W. RAY

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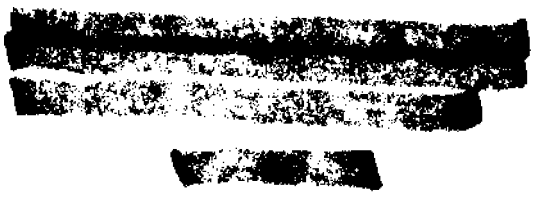

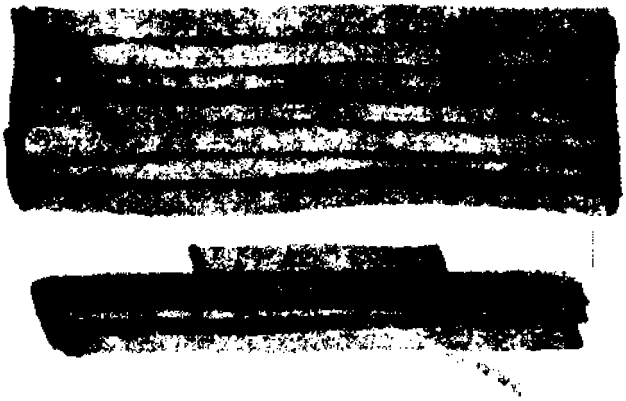

FOREWORD

The history contained within these covers endeavors to unfold the stories of the MB-1, the GAR-11 and GAR-9, as they applied to ADC up to mid-1963. The old designations are employed throughout the narrative; therefore a table equating the old versus the new designations is herewith included:

Old	New
MB-1	AIR-2A
MMB-1	AIR-2B
GAR-11	AIM-26A
GAR-11A	AIM-26B
GAR-9	AIM-47A

The narrative history is accompanied by three volumes of supporting documents cited in the narrative footnotes. In addition to corroborating statements made in the narrative, the supporting documents amplify information contained in the narrative. Much credit for the preparation of this document rightfully belongs to specialists in the Headquarters staff who opened their minds and files in order to supplement and render understandable the information gathered by the historian. The fact that members of the ADC staff provided invaluable help in the preparation of this history does not mean, however, that the history necessarily reflects the viewpoint of the Command. Readers are cautioned not to make the history the basis for official action.

TABLE OF CONTENTS

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INTRODUCTION: THE IMPORT OF NUCLEAR ARMAMENT

For the past seven years -- almost half of its lifetime -- ADC has employed nuclear armament. Use of MB-1 and GAR-11 air-to-air weapons and BOMARC IM-99A/B ground-to-air missiles has multiplied by many times the command's capability for stopping enemy bomber attacks. Along with the advantages brought by these weapons, however, came formidable disadvantages.

The presence of atomic weapons, in effect, placed ADC under a sword of Damocles: one false step might lead to an accidental detonation, and an exploded nuclear weapon at a tactical base might virtually wipe out the unit involved.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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But more than the safety of each atomic-capable tactical unit was at stake. In addition to blasting a squadron sky-high, toxic residual radiation could be scattered for miles from the scene of detonation and cause plutonium poisoning. NATO nations storing U.S. nuclear weapons abroad might be tempted to revoke permission for their further storage, while at home, the adverse publicity resulting from such an explosion, and consequent Congressional action, could prevent within a short time further use of nuclear armament which had taken ADC years to plan for, develop, finance, and implement. Worse for the national defense, ADC's ability to strike down attacking enemy bombers would be cut to a fraction of its existing capability. But worst of all, the possibility, though remote, that an "accidental war" might be started was not to be ruled out. The magnitude of the problem of handling and using nuclear weapons safely and efficiently, therefore, was staggering.

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EARLY PLANNING, 1951-1955

No one seemed against ADC's proposal (suggested in 1951; embodied in a formal requirement 31 January 1952) that atomic ordnance be adapted to air defense use. Although a small warhead proportional in size to interceptor armament had not, as of then, been developed, encouragement came from several quarters, not the least of which was USAF, and including the Joint Air Defense Board of the Joint Chiefs of Staff. It was the way ADC first intended to use atomic armament that made Air Force Special Weapons Center (AFSWC), an agency of the then ARDC, to take exception, particularly after studying the matter in Project Heavenbound (1952-53). Until an atomic warhead was produced as a package small enough to fit inside an interceptor air-to-air rocket -- something that would take years to develop -- ADC considered employing existing atomic bombs with interceptors for purposes of droping them as "free-fall" air-to-air bombardment weapons on hostile targets. ADC reasoned that nuclear armament could be made available for air defense purposes comparatively soon by drawing from weapons in the existing stockpile and adopting toss-bombing techniques; but AFSWC discouraged it on grounds that such tactics, while possibly

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effective under ideal circumstances, would be futile against maneuvering targets or targets concealed by foul weather. Tests of the bombing proposal were carried out by Air Proving Ground Command (APGC) in 1954, resulting in the proposal being scrapped.[2]

Meantime, ADC's long-term requirement, reaffirmed 23 March 1953, for development of a light-weight warhead in the low-kiloton power bracket ended with more favorable results. The warhead was to equip an air-to-air rocket designed for use with ADC interceptors. In late 1953, USAF instructed ARDC to investigate methods for mating a small-sized nuclear warhead to an air-to-air missile, since theretofore none had been constructed. On 2 April 1954, the JCS approved the development of such a missile. Before 1954 was over, the characteristics desired for the projected atomic rocket, temporarily named "Ding Dong," were drawn up, and a contract for its development was awarded Douglas Aircraft Company.

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2. RESTRICTED DATA, ADC Historical Study No. 2, Nuclear Weapons in the Air Defense System, Sep 1953; Ltr, ADC to ARDC, "Nuclear Weapons for Air Defense," 21 May 1952 [DOC 1]; Ltr, ADC to USAF, "Atomic Weapons in Air Defense," 26 Nov 1954 [DOC 3].

[redacted]

The Atomic Energy Commission (AEC) commenced work on developing a warhead. An unguided rocket was sought that was powered by a solid-propellant rocket motor capable of transporting it three to five miles. It was to weigh about 800 pounds and have a diameter of 15 inches. As envisioned, it would contain "a sealed warhead (nuclear and explosive components, detonators, and firing system), a sealed fuzing unit with necessary safety features, and an aerodynamic case and stabilizing vanes."* The JCS designated 1 January 1957 as the target date for ADC to become operational with nuclear armament -- a target date reaffirmed by the National Security Council. While several interceptors were considered to be prospective users of the new rocket, the F-89D was singled out as the one interceptor adaptable in the few years remaining before the 1 January 1957 target date. Along with the planning for the projected "Ding Dong" (subsequently redesignated, after development, the MB-1 "Genie") and its carrier interceptor, considerable thought was given to perfecting safety devices, storage facilities and associated ground handling equipment, as well as practice and training versions of the nuclear rocket fitted with dummy or conventional HE warheads. The F-89J/MB-1 system and support equipment was authorized for development during the 1955-56 time period.[3]

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3. RESTRICTED DATA, ADC Historical Study No. 2, Sep

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GENERAL SAFETY CONSIDERATIONS

Maintaining ADC's future atomic arms free from unauthorized or accidental detonation (without disabling them of their nuclear impact when needed) entailed guarding them against three categories of vulnerability: (1) technological imperfections and malfunctions; (2) human errors that traditionally had figured high -- over 50 per cent -- in accident causation; and (3) deliberate attempts to trigger them without authorization (either by saboteurs or persons of unbalanced mentality). The first category, technological imperfections and malfunctions, included not only defective apparatus inside and attached to the rocket, but also ground handling equipment, storage and checkout facilities and interceptor launching equipment coming into contact with the rocket. Fortunately, ADC was not alone in facing these

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[Cont'd] 1953; Ltr, ADC to USAF, "Atomic Weapons in Air Defense," 26 Nov 1954 [DOC 2]; * RESTRICTED DATA, USAF, "Hq USAF Logistic Planning Guidance Air-To-Air Rocket," 8 Nov 1954 [DOC 3]; DF ADC, DCS/M to DCS/O, "Special Weapons Briefing, Albuquerque, 19 Jul 1954," 22 Jul 1954 [DOC 4]; Hist of ADC, Jan-Jun 1954, pp. 146-47; Hist of ADC, Jul-Dec 1954 pp. 88-89; RESTRICTED DATA, Ltr, ADC to USAF, "Storage and Handling Dolly for Ding Dong," 20 Apr 1955 [DOC 5]; Rpt, AFSWC to ADC, "Weekly Summary Status of Project Ding Dong," 10 May 1955 [DOC 6]; Msg AFOOP-OP-D, USAF to ADC, 10 Jun 1955 [DOC 7]; Hist of ADC, Jan-Jun 1955, p. 90; Ltr, ADC to USAF, "Utilization of Atomic Weapons on F-89D/H," 21 Feb 1955 [Doc 315 in Hist of ADC, Jan-Jun 1955].

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problem areas; other USAF commands (including AFSC, AFLS and ATC), the Atomic Energy Commission, the Joint Chiefs of Staff, and various prime contractors, among others, were also deeply involved.[4]

MB-1 "GENIE" AND FACILITIES

While planning for, and fabrication of, the MB-1 air-to-air rocket (subsequently carried by the F-89J, F-101B, and F-106A) dated back to 1951-1955, it was 1957 before the MB-1 actually entered the air defense scene. Between times, prototypes of the rocket were fabricated and, beginning in late 1955, test fired without warheads at Holloman AFB, New Mexico. Starting on 8 March 1956, live ballistic tests fired from interceptors were conducted for the first time, again without warheads. Difficulties revealed with rocket motor performance and flight stability were shortly solved and corrected. Because of time limitations, the MB-1 development and production schedule was telescoped to coincide with conversion of F-89D's to the "J" configuration, so that some of both would be ready, together with necessary support facilities, by the 1 January 1957 target date. Consequently,

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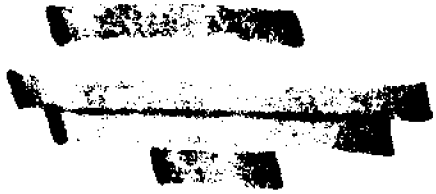
4. Ikle, op. cit., pp. iv-v, 10-21.



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tests of the MB-1 were incomplete as of the end of 1956.[5]

By mid-1957, physical tests of the MB-1 were over. Nineteen more airborne MB-1's without warheads were aimed at QB-17 and QF-80 drones, only a few of which failed to burst. The total count amounted to 34 probable hits out of 37 attempts, resulting in a 92 per cent kill probability for the MB-1.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

Elaborate plans were laid the following year for further tests of live MB-1's in late 1958, called Project OPERA HAT. But this time ADC was caught in the cross currents of international pressure to halt atomic testing -- manifested in part by the U.S. moratorium announced in November 1958 -- and the tests, accordingly, were cancelled.

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5. Hist of ADC, Jul-Dec 1955, p. 105; Hist of ADC, Jan-Jun 1956, p. 56; Hist of ADC, Jul-Dec 1956, p. 107; Msg RDZPD-6-4-E, ARDC to ADC, 6 Jun 1956 [Doc 283 in Hist of ADC, Jan-Jun 1956]; Msg OOMWA-657, AMC to WRAMA, 22 Nov 1956 [Doc 133 in Hist of ADC, Jul-Dec 1956]; RESTRICTED DATA, ADC Historical Study No. 14, History of Air Defense Weapons 1946-1962, pp. 289-94.

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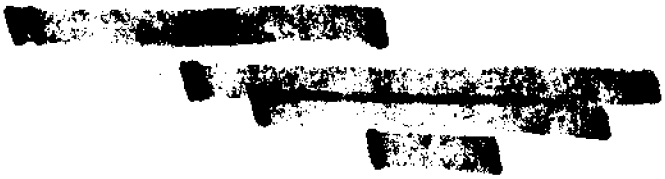

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Virtually this same pattern repeated itself in late 1963 as ADC's hopes for tests of live MB-1's and GAR-11's in Project BLUE STRAW were doomed to frustration by restoration of the moratorium.[6]

As finally developed the MB-1 pocketed a king-sized punch. Manufactured by the Douglas Aircraft Company, the MB-1 was a large, heavy weapon, as air-to-air rocket sizes go, weighing over 800 pounds and extending nine and one-half feet in length. At its widest girth, it measured nearly a foot and one-half in diameter. Therefore, by virture of its dimensions alone, the MB-1 required special handling. A four-wheel trailer designated the MF-9 was especially designed and produced to cradle the "Genie" in storage and transport it to and from the alert area for use. The MF-9 trailer possessed a self-contained hydraulic lift so that loading crews could safely raise and lower the MB-1 for loading and unloading operations and minimize physical contact with the weapon. The MB-1 contained a solid propellant MD-1 rocket motor made by Aerojet General Corporation that propelled it about six miles at speeds approximating Mach 3; it could reach altitudes up to 75,000 feet.[6]

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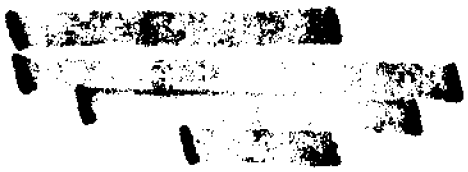

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The MK-25 sealed warhead of the MB-1 weighed about 219 pounds. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

A timer fuze ignited the HE imploding it symmetrically, compressing the plutonium to a point of detonation.

Although it received no guidance outside that provided by the interceptor's fire control system, the "kill area" of the MB-1 was so great as virtually to preclude a miss. It was estimated, as noted above, to have a kill rate of 92 per cent. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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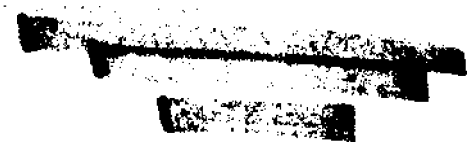

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MMB-1. Almost from the day the MB-1 came off the drawing board, thought was given to equipping it with a radar proximity fuze to improve its reliability in an ECM environment. Originally proposed by ADC in 1955, the plan for an MB-1 proximity fuze dragged on several years before finally being approved. Not till October 1961 was a contract awarded to the Douglas Aircraft Company to develop a nose cone containing both a timer and a proximity fuze, with a view to perfecting the MMB-1 "Super Genie," as it was called, for operational use by 1963. Air Force Systems Command foresaw an increased kill probability for the MMB-1 since aircrews, prior to triggering their "Super Genies," would select the fuze best suited to their targets. The first MMB-1 prototype was readied for testing in February 1963; but a hitch occurred in the plans. Mounting costs for MMB-1 development, together with Defense Department cuts in USAF development funds, had placed the project squarely in competition with higher-priority projects for additional USAF funds. The upshot was that the MMB-1's downfall as a going project was precipitated. Notwithstanding ADC's strongest protests, further MMB-1 development was officially cancelled on 5 March 1963.[8]

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8. Hist of ADC, Jul-Dec 1957, pp. 107-08; Hist of ADC, Jul-Dec 1960, p. 246; Hist of ADC, Jan-Jun 1961, p.207;

[redacted]

Despite its powerful charge, the MB-1, like the GAR-11 and BOMARC warheads that came later, was a sealed pit weapon "one-point" safe. Fissionable materials were sealed in a container that rendered contamination impossible as long as the container remained intact. Unless intentionally triggered (by deliberately performing a prescribed number of positive, independent actions in proper sequence to energize the fuzing and firing systems), neither the MB-1, the GAR-11, nor the BOMARC IM-99A/B could experience a full-scale nuclear explosion, according to expert opinion. Before the arming system inside the MB-1 could actuate the fuzing and firing mechanisms that ignited the warhead, the rocket had to be properly launched and travel a certain distance from the carrying interceptor. Furthermore, the

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[Cont'd] ADC Historical Study No. 14, op. cit., pp. 294-95; FORMERLY RESTRICTED DATA, USAF, Current Status Report, Feb 1963, p. 3-5 [HRF]; Msg ADODC 3183, ADC to USAF, 19 Nov 1962 [DOC 13]; NOFORN EX CANADA, Msg ADCCR 1950, ADC to USAF, 14 Sep 1961 [DOC 14]; Msg SCGV-27-9-27, AFSC to ADC, 27 Sep 1961 [DOC 15]; Msg ASZDGW-31-10-21, ASD to ADC, 31 Oct 1961 [DOC 16]; Msg AFSSA-AS-5 94723, USAF to AFSC, 22 Jan 1962 [DOC 17]; Msg ADCCR-1719, ADC to USAF, 22 Jun 1962 [DOC 18]; Msg ADCVC 1816, ADC to USAF, 9 Jul 1962 [DOC 19]; Msg ADOOP-WT 318, ADC to SAAMA, 31 Jan 1963 [DOC 20]; Msg ADCVC 299, ADC to USAF, 30 Jan 1963 [DOC 21]; Msg Douglas Acft Co to ASD, 14 Feb 1961 [DOC 22]; Msg ADCVC 538, ADC to USAF, 19 Feb 1963 [DOC 23]; Msg ADOOP-WT 627, ADC to ASD, 1 Mar 1963 [DOC 24].

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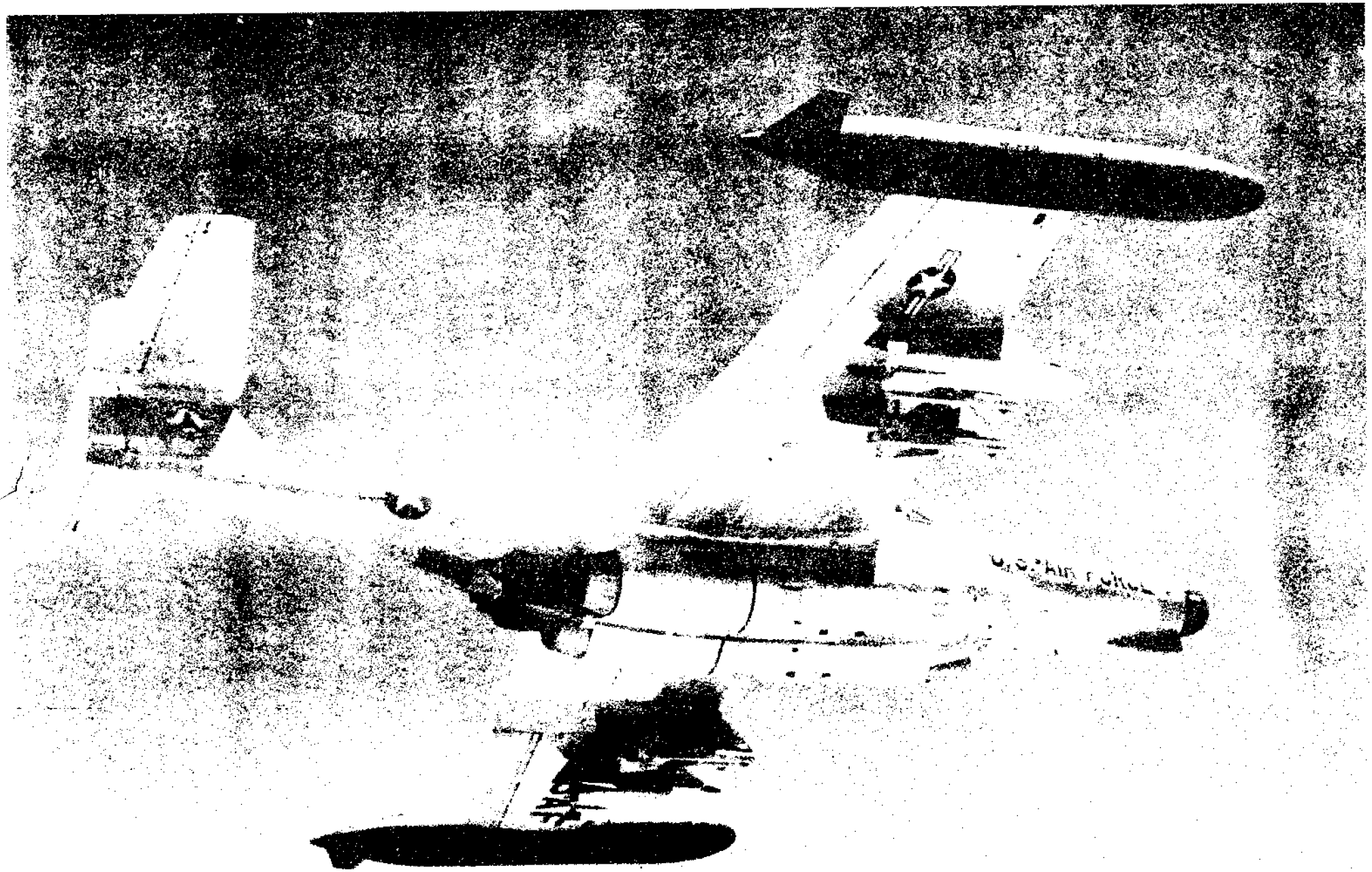

F-89J carrying two inert versions of the MB-1 (painted white) as well as four smaller GAR-2 Falcon missiles.

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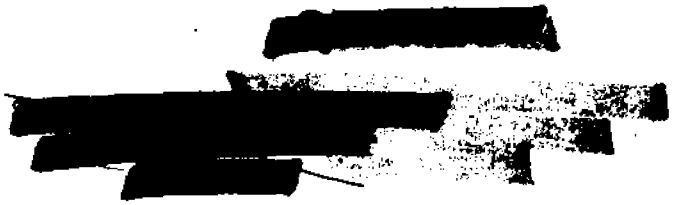
interceptors employed to carry the MB-1, and later the GAR-11, contained certain safety features, including separate launching circuits and "Arm/Safe" and "Armament Selector" switches ordinarily kept safety-wired and sealed, calling for a deliberate conscious effort on the part of the aircraft commander to break the seals and re-adjust the switches before rendering the nuclear weapons launchable.

About the worst that might happen to the MB-1 or to any warhead "one-point" safe was for the High Explosive (HE) element of the triggering mechanism, because of fire or impact (resulting from a smashup or from being dropped in flight), to catch fire and burn, or explode. If the HE did explode, it would not result in a symmetrical implosion, which the fuzing and firing systems alone could generate; therefore a nuclear detonation would not ensue. Nevertheless, the sealed container was apt to rupture, allowing the internal charge of plutonium to scatter downwind, probably creating serious plutonium poisoning wherever it spread.

While the safeguards and techniques perfected to protect against accidental nuclear blasts of the MB-1 were reassuring, they were no reason for complacency. In addition to grave consequences issuing from an inadvertant



explosion of the HE component or of the solid propellant contained in the rocket motor, there lingered the everlasting menace of an irrational person or a saboteur familiar with the working mechanism of the MB-1 purposely touching off a full-scale explosion. Furthermore, the possibility that an MB-1 or other atomic weapon might fully detonate if struck directly by lightning had never been altogether ruled out.[9]

For the most part, however, the lightning issue was academic. Except when in the open while in transit or while deployed for loading operations, tactical MB-1's employed with alert aircraft were protected with cover afforded either by an alert hangar or by the interceptor fuselage (in later Century series models); while those in storage (where they spent most of their lifetime tucked safely away) were sheltered in specially constructed bins.

Indeed, getting MB-1 storage assembly and maintenance compounds authorized, sited, surveyed, funded, contracted

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9. Ikle, op cit., pp. 2, 12-13, 21-37, 52, 98; RESTRICTED DATA, Hq USAF Special Weapons Center, Safety Study of the MK-25/MB-1 Air-to-Air Rocket for the F-89J Application, SWVN-58-1, Jan 1958 [DOC 11]; ADCM 27-4, Program Control Plan F-89J, 15 Apr 1959, pp. 6-7 [DOC 12]; Hist of EADF, Jan-Jun 1957, p. 86, and Jan-Jun 1958, pp. 13-14; Hist of ADC 1958, p. 225; ADCM 355-1, op. cit., 1 Jan 1962 [HRF].

and erected consumed much of the time spent by ADC on nuclear subjects from 1955 to 1957. No MB-1's could be delivered, according to a DOD policy, until facilities were completed to house and maintain them in the style prescribed. ADC siting teams visited a number of bases in early 1955; and mindful of security requirements and applicable explosive quantity distances, they selected prospective sites for MB-1 facilities at Oxnard, Hamilton, Paine, Truax, Bunker Hill, Youngstown, Dover, Otis, Presque Isle, Griffiss, Wurtsmith and K.I. Sawyer. Meanwhile, ADC originally asked USAF for $10,000,000, raised later to $18,000,000, to pay construction costs of the first round of MB-1 facilities. By the end of 1955, USAF approved a construction schedule for fiscal years 1956 and 1957, which was subsequently revised and expanded to conform to changing needs. In February 1956, the standards for storing and maintaining the MB-1 were codified and published in the MB-1 Weapon System Logistic Plan. The rush was on to arm a portion of the regular ADC interceptor force with nuclear rockets, with the 1 January 1957 target date imposed on ADC by USAF and the National Security Council kept uppermost in view. Construction commenced on MB-1 facilities at Hamilton, Wurtsmith, Dover and K.I. Sawyer in early 1956, and those at Hamilton and Wurtsmith

were sufficiently completed by year's end to allow several F-89J's based there to assume an alert posture armed with MB-1's as of 1 January 1957, thus meeting the NSC-assigned deadline.[10]

Costing over $1,000,000 per complex, the MB-1 storage, testing and security facilities erected at each base assigned the "Genie" was purposely set apart from other on-base components to localize whatever damage might originate therein, yet be near enough to interceptor loading aprons to allow expeditious loading in case of emergency. A typical MB-1 storage area, designed and constructed uniformly to serve an F-101B or F-106A squadron as well as the F-89J squadron first to employ the "Genie," occupied upwards of fifteen acres of ground and contained from three to five storage magazines plus an assembly and check-out building. If bunched closely together, the magazines and maintenance building were individually shielded by earthen barricades.

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10. Msg ADMIS-2 3178, ADC to USAF, 28 May 1955 [DOC 25]; Rpt, ADMIS to DCS/M "Narrative Visit Report, Pre-Negotiation Conference for Selection of an Architect-Engineer to Design 'Ding Dong' Facilities," 8 Aug 1955 [DOC 26]; Msg 52766, USAF to ADC, 1 Dec 1955 [DOC 27]; Msg ADMAC-CD 0020, ADC to USAF, 24 Jul 1957 [DOC 28]; Msg ADMAC-CA 383, ADC to WADF, 26 Feb 1958 [DOC 29]; Hist of ADC, Jan-Jun 1956, p. 52.

Each storage magazine, measuring 156 feet long by 35 feet wide, contained 30 cubicles or bins made of reinforced concrete and hung with steel doors, housing one MB-1 apiece cradled on an MF-9 trailer or a storage pallet. The self-contained assembly and check-out building was compartmentalized into an uncrating room, heating and air conditioning area, ready room, latrine, office and records area, maintenance and parts storage area, and an assembly and test area.

Pressure and electrical tests on the MK-25 warhead were among the tests performed in this building. Pressure tests were ordinarily administered every 30 days. Fearing that an inadvertant detonation might occur, electrical tests of the MK-25 were discontinued in late 1957 until the T-284 tester was modified or replaced. Eventually, the T-304A electrical tester became available and warhead electrical tests were resumed. Other components of the "Genie" were regularly checked every 60 days with warhead disconnected, including tests of the fuze section, igniter circuitry, and heater blanket circuitry.

To protect the "Genie" from detonation by saboteurs, the entire MB-1 ordnance compound was surrounded by a layer of seven-foot high, chain-link fencing extending about 1360

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feet long by 490 feet wide. Together with a security control building guarding the entranceway, the fencing figured prominently in barring access to all but authorized personnel. Alarm systems were installed to sound warning of unauthorized penetrations. As a further precautionary measure, qualified guards or armament technicians were detailed to accompany the weapons anytime they were removed from the storage compound. While loaded aboard interceptors assigned the alert duty, guards were posted nearby to protect the nuclear armament from unwanted intrusions.[11]

While fulfillment of the MB-1 facilities program represented one of ADC's greatest obstacles to achieving an early nuclear capability, there were lesser ones besides.

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11. ADCM 27-4, op. cit., 15 Apr 1959, pp. 8-11 [DOC 12]; RESTRICTED DATA, AFSWC, SWVN-58-1, op. cit., January 1958, pp. 14-16 [DOC 11]; ADCM 27-8, Program Control Plan, F-101B, 15 May 1958, pp. 9-12, 23 [HRF]; Ltr, USAF to All Major Cmds, "Explosive Safety Criteria Applicable to Rocket, Air-to-Air, Type MB-1," 17 Jun 1955 [Doc 221 in Hist of ADC, Jul-Dec 1955]; RESTRICTED DATA, Msg SWVWT 18-65-E, AFSWC to AMC, 15 Aug 1957 [DOC 30]; RESTRICTED DATA, Msg MC 7-16110-E, AMC to AFSWC, 16 Aug 1957 [DOC 31]; RESTRICTED DATA, Msg SWVWT 1-7-97-E, AFSWC to AMC, 21 Aug 1957 [DOC 32]; RESTRICTED DATA, Msg AFMME -AR 59614, USAF to AMC, 26 Aug 1957 [DOC 33].

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Like any weapons system being newly introduced, there were collateral needs for developing proper handling techniques and suitably configured tools and other equipment for MB-1 ground servicing crews -- sometimes by trial and error -- all of which took time to perfect. Work in this area began in 1955; as noted above, the MF-9 trailer was developed for use. Equipment and engineering evaluation tests were conducted in late 1956, months before ADC received the MB-1, during which time changes deemed essential to safety and efficiency were adopted. During the same year, an MB-1 dummy rocket was developed for purposes of exercising ground handling crews in the skills of practice assembly, check-out and loading procedures. A training version, also with inert warhead, was devised for aircrew practice launching.

Despite these advance preparations, however, standardized handling procedures were woefully lacking during the first months of ADC's nuclear air-defense career, requiring improvisation based on experience gained by ADC representatives the year before during the dry runs and experimental trials.[12]

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12. Hist of WADF, Jan-Jun 1957, pp. 97-98; Hist of WADF, Jul-Dec 1958, pp. 42-43.

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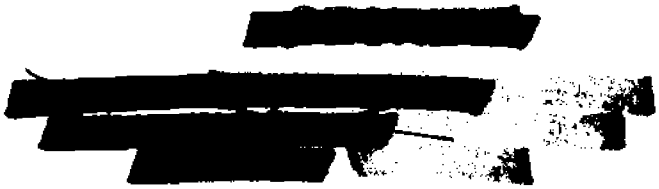

To ease the problem of standardizing procedures, ADC issued manuals, SOP's, regulations, checklists and other official literature directive in nature over a period of years, spelling out step by step, in considerable detail, the sequence and progression of activities involving nuclear armament. Armament crew assignments were carefully systematized and expounded, and aggressive OJT programs were enforced. An energetic suggestion program was adopted that encouraged the development of improved techniques and features calculated to dispatch nuclear activities with further safety and alacrity. Engineering improvements were constantly sought that would further the integrity and inviolability of nuclear missiles as well as associated subsystems.[13]

F-89J/MB-1 Combination. The Northrop two-place F-89 model interceptor originally entered service with ADC in 1951; but it was 1957 before it was capable of carrying nuclear armament. Beginning in March 1956, during modification

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13. Ikle, op. cit., pp. 13-21; ADCM 355-1, op. cit., 1 Jan 1962 [HRF]; RESTRICTED DATA, AFM 122-1, op. cit., 15 Sep 1961 [HRF]; ADCR 52-1, Technical Training MB-1 Assembly and MB-1 and GAR Loading Training, 15 Jul 1962 [HRF]; ADCM 136-1, ADC Munitions Technical Manual Weapons Loading Management, 1 Nov 1962 [HRF].

project "Bellboy," F-89D-style interceptors were converted to the F-89J configuration expressly to equip them for carrying two MB-1 "Genie" nuclear rockets attached to pylons suspended from either wing. The MG-12 fire control system was developed and installed for aiming and triggering the MB-1 at targets singled out by the radar. The first F-89J's were delivered to the Command in December 1956. On 1 January 1957, as noted above, F-89J's were standing alert equipped with the MB-1, nine at Hamilton Air Force Base, California, and six at Wurtsmith AFB, Michigan, marking the advent of nuclear arms in U.S. air defense. The F-89J/MB-1 combination comprised ADC's sole atomic weapons system until 1959, when F-101B, F-106A and BOMARC squadrons began phasing in. Each F-89J squadron deployed in the United States was assigned 112 MB-1's. Besides two MB-1's, the F-89J carried as secondary armament two GAR-2A's.[14]

During 1957, construction of MB-1 facilities was unable to keep abreast of expectations, as delays at Dover, Paine, Griffiss, Otis and Oxnard pushed scheduled completion

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14. ADC Historical Study No. 14, Air Defense Weapons, 1946-1962, pp. 209-10, 293; ADCM 27-4, Program Control Plan F-89J, 15 Apr 1959, pp. 1-12 [DOC 12]; Hist of ADC, Jan-Jun 1957, pp. 129, 142; Hist of ADC, Jul-Dec 1956, p. 118.

[redacted]

dates months behind. At mid-1957, the F-89J squadrons at Hamilton and Wurtsmith were still the only ones maintaining alerts armed with the MB-1, although ADC had fully intended that four others join them by this time. Foreseeing the trend of things and anxious to become more nuclear-capable without undue delay, ADC asked in early 1957 that waivers be granted to the edict requiring completed MB-1 facilities before "Genies" were delivered. ADC was convinced that existing facilities could be altered to provide suitable interim storage areas. But the DOD refused to budge from its original position. Steadfast to the last, however, ADC finally dissuaded DOD in late 1957, so that squadrons equipped with adequate interim storage facilities and pronounced ready to assume operations with the F-89J/MB-1, were assigned four MB-1's for standing alerts until permanent facilities were finished. Provision was also made to airlift more MB-1's to these squadrons when forewarned of an impending attack.[15]

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15. Msg ADOOP-O 0115, ADC to Air Def Forces, 25 Sep 1957 [Doc 248 in Hist of ADC, Jul-Dec 1958]; Hist of ADC, Jan-Jun 1956, p. 52; Hist of ADC, Jul-Dec 1956, p. 119; Hist of ADC, Jan-Jun 1957, pp. 129-30, 142-43; Hist of ADC, Jul-Dec 1957, pp. 72-73; Hist of WADF, Jan-Jun 1958, pp. 80-81; Hist of WADF, Jul-Dec 1958, pp. 42-43; Msg ADMAC-OD 00649, ADC to AMC, 1 Feb 1957 [Doc 217 in Hist of ADC, Jan-Jun 1957];

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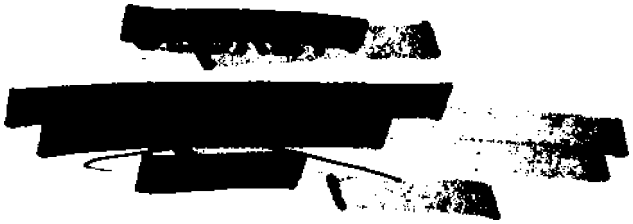

Lt. General Joseph Atkinson, then Commander of ADC, stressed the urgency for F-89J units to become operationally ready with the MB-1. Obviously pleased with the magnitude of additional air defense capability offered by the F-89J/MB-1 combination, he informed the Air Defense Forces in September 1957:*

> The F-89J is the only MB-1 carrier in the current ADC inventory and must be considered equally important as the weapon. We are being equipped with these aircraft and weapons as rapidly as possible, commensurate with production, base facilities and training of personnel. It is my desire that commanders of all echelons take necessary actions to assure the most rapid and effective integration of this nuclear weapon system into our air defense complex. We must make every possible effort to ascertain that each F-89J we possess can be armed with MB-1 rockets and effectively utilized in the event of hostilities.

[Cont'd] Hist of ADC 1958, pp. 267-68; Hist of CADF, Jan-Jun 1958, pp. 50-52; Hist of EADF, Jan-Jun 1958, pp. 11, 63 (fn 26); Msg ADOOP-O 0185, ADC to Air Def Forces, 15 Nov 1957 [Doc 203 in Hist of ADC, Jul-Dec 1957]; Hist of CADF, Jul-Dec 1958, pp. 28-29; Msg ADMAC-CD 0020, ADC to USAF, 24 Jul 1957 [DOC 28]; Msg EAMAC-3 9979, EADF to ADC, 9 Aug 1957 [DOC 34]; Msg AFMSS-EA-1 59919, USAF to AMC, 4 Sep 1957 [DOC 35]; Msg EAMDM 1096, EADF to ADC, 9 Sep 1957 [DOC 36]; Msg AFMSS-EA-1 50156, USAF to AMC, 10 Sep 1957 [DOC 37]; Msg ADMAC-CA 0833, ADC to SAC, 23 Dec 1957 [DOC 38]; Msg MAC378, 32 AD to ADC, 22 Sep 1959 [DOC 39].

* Msg ADOOP-O 0115, ADC to Air Def Forces, 25 Sep 1957 [Doc 248 in Hist of ADC, Jul-Dec 1958].

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By the end of 1957, five more F-89J squadrons were phased in together with allocated MB-1's, despite the fact that only three of them owned completed MB-1 storage compounds. At the height of their use in 1958, more than 260 F-89J's were on hand to equip eleven squadrons. Their useful service lifetime in the regular force lasted till the end of 1960. While most F-89J squadrons had become operational by 1959, it did not spell an end to construction of MB-1 storage compounds. Indeed, some 30 bases in all were slated for them because of Century interceptors to phase in by 1961, as a result of which construction work continued for the rest of the decade.[16]

One of the eleven F-89J squadrons, the 59th FIS, was stationed at Goose Air Base, Labrador. The 59th FIS acquired its F-89J's in July 1957 with the expectation that the Canadian government would shortly permit the storage of

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16. Hist of ADC, Jan-Jun 1957, pp. 129-30, 142-43; Hist of ADC, Jul-Dec 1957, pp. 95-96; Hist of WADF, Jan-Jun 1957, pp. 72-73; Hist of WADF, Jan-Jun 1958, pp. 80-81; Msg ADMAC-OD 00649, ADC to AMC, 1 Feb 1957 [Doc 217 in Hist of ADC, Jan-Jun 1957]; Hist of ADC, 1958, pp. 267-68; Hist of CADF, Jan-Jun 1958, pp. 50-52; Hist of EADF, Jan-Jun 1958, pp. 11, 63 (fn 26); Msg ADOOP-O 0185, ADC to Air Def Forces, 15 Nov 1957 [Doc 203 in Hist of ADC, Jul-Dec 1957]; Hist of CADF, Jul-Dec 1958, pp. 28-29; Msg ADMAC-CD 0020, ADC to USAF, 24 Jul 1957 [DOC 28]; Msg EAMAC-3 9979, EADF to ADC, 9 Aug 1957 [DOC 34]; Msg AFMSS-EA 1 59919,

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U.S. nuclear weapons on Canadian soil. So confident, indeed, was USAF that an agreement would soon be consummated that an MB-1 storage and maintenance complex was authorized, funded and constructed. But political undertones permeated the whole problem; the issue became controversial with one Canadian faction siding for and another against allowing the United States this provilege. Some Canadian leaders were willing to settle for jointly controlled storage rights. As the years rolled by without formal dispensation being granted by the Canadian Government, alternate plans were carefully weighed. After much soul-searching, a plan was adopted whereby the 64th Air Division would airlift MB-1's to the 59th FIS at Goose in times of emergency, which at best was clumsy and time-consuming. In July 1959, an ORI team, after observing a test of the plan, concluded that, given the most ideal of circumstances, at least six hours would be absorbed delivering MB-1's from the United States to the 59th FIS -- scarcely time enough to help repel early waves of

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[Cont'd] USAF to AMC, 4 Sep 1957 [DOC 35]; Msg EAMDM 1096, EADF to ADC, 9 Sep 1957 [DOC 36]; Msg AFMSS-EA01 50156, USAF to AMC, 10 Sep 1957 [DOC 37]; Msg ADMAC-CA 0833, ADC to SAC, 23 Dec 1957 [DOC 38]; Msg MAC 378, 32 AD to ADC, 22 Sep 1959 [DOC 39].

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attacking bombers. However, the impetus to obtain atomic storage rights at Goose slowed down in 1960 when the 59th FIS exchanged its F-89J's for F-102A's that were equipped to carry conventional weapons only. But the issue cropped up anew when the F-102A's were modified to carry GAR-11 atomic armament in 1961, not only at Goose but at Thule, Greenland, where nuclear storage rights had yet to be granted by Denmark.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

As for Thule, a select number of tactical GAR-11's were housed at Seymour Johnson for airlift to Thule during an emergency.[17]

Meanwhile, as regards the F-89J fleet, tactical methods for delivering the MB-1 by F-89J, at first fluid, gradually shifted from the lead-collision course style,* to that of the front quarter attack, adopted as dogma in 1958. To offset an altitude advantage enjoyed by oncoming bombers, the

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

* A broadside approach so the interceptor could take advantage of added time and larger target surface to achieve a lock-on with the interceptor fire control system.

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climbing and snap-up modes of frontal attack were regularly practiced. Escape maneuvers were also perfected, so that the pilot gained reasonable confidence that he could turn in time, following release of an MB-1, to avoid the dangerous aftereffects of the explosion.[18]

Until permanent, fully certified doctrine governing F-89J/MB-1 activities could be firmly established, interim rules were drafted and circulated formulating policy with respect to these matters. Before alerts were first assumed with the MB-1 in early 1957, the JCS granted interim permission for use of the F-89J/MB-1 weapons system. By ordaining that live MB-1's could not be flown in tactical aircraft unless under conditions of Air Defense Readiness or higher states of alert, the JCS, in effect, removed the risk of an airborne MB-1 accident during peacetime resulting from an inadvertant rocket launching or jettisoning, or from the impact of an interceptor crash. In essence, the JCS ruling, except during emergencies, grounded the MB-1 inventory.

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18. RESTRICTED DATA, Msg DCS/O-TR 0849C, APGC to USAF, 2 Jul 1957 [DOC 8]; Hist of ADC, Jul-Dec 1956, pp. 92-93; Hist of ADC, Jan-Jun 1957, 123-24; Hist of ADC, Jul-Dec 1957, pp. 82-87; Hist of WADF, Jul-Dec 1957, pp. 79-81; Hist of ADC, 1958, p. 186; ADCM 55-5, 1 Mar 1958, p. 24 [Doc 348 in Hist of ADC, 1958].

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But ADC felt strongly that MB-1's should be flown in peacetime by the F-89J, both during day-to-day identification missions in case unknowns proved to be hostile, and during practice missions exercising wartime plans to reposition MB-1's in a dispersed posture, preferably before advanced states of alert were implemented. Pointing to a scientific analysis which concluded that plutonium contamination caused by an accidental MB-1 detonation (as might result from the crash of a Genie-ladened F-89J) could be adequately controlled, ADC asked in 1957 that the JCS edict be rescinded or eased. But ADC's efforts were in vain; the command was forced to bow to higher authority, which remained adamant to its ruling that MB-1's during peacetime remain earthbound until a substantial threat existed. For a brief time in late 1957, some thought was given to devising an alternate, safer MB-1 warhead, tentatively called "Fleegle." [redacted] (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

In consequence of the JCS policy, no live MB-1's were flown for tactical purposes by the command for over five years, till late 1962, when dispersal operations implemented during the Cuban Crisis called for them to be flown

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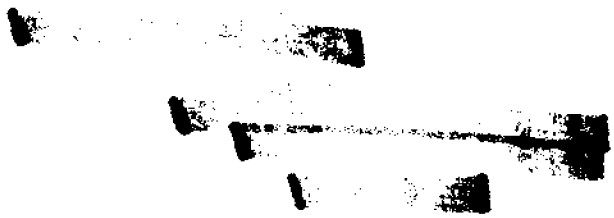

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from home base to various preselected bases by Century series[19] aircraft.

While this may have limited MB-1 use in the air solely to times of emergency, there were no similar restrictions at first to their use on the ground. They were employed both for practice drills and for active air defense alerts. On December 6, 1957, ADC levied an operational requirement for F-89J squadrons to load two live MB-1's on 18 F-89J's within one hour's time. Accordingly, three-fourths of each F-89J squadron would be readied to stop the worst of oncoming waves of enemy bombers. This directive was modified at mid-1958, however, after discovery that it was simply unachievable during off-duty periods at those squadrons lacking on-base housing (because of the necessity to recall MB-1 ground servicing teams from miles away), while it imposed morale-breaking hardships on those squadrons having on-base housing (by keeping MB-1 teams on call during their leisure time).

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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Consequently, on 1 June 1958, ADC changed the requirement so that F-89J units were to maintain the capability of mass-loading MB-1's on all operationally ready interceptors (up to 18) in one hour during normal duty hours, and on a minimum of five interceptors in one hour during off-duty hours. Command and force level representatives from the office of Inspector General regularly and frequently conducted mass-loading exercises on the F-89J fleet to test and appraise its performance of this task. By diligent training, practice and close adherence to loading procedures painstakingly perfected for their guidance, ground handling crews demonstrated time and again their skillfulness and dexterity in handling MB-1's expeditiously and safely, enabling them to meet ADC's criteria for successful mass-loading. These exercises, together with another exercise simulating interceptor crashes involving nuclear armament, were ordinarily incorporated as part of a squadron tactical evaluation or operational readiness inspection.[20]

The alert requirement enjoined by CINCNORAD was tied to the JCS injunction prohibiting flight with the MB-1, for

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20. Hist of EADF, Jan-Jun 1958, pp. 63-66; Hist of WADF, Jan-Jun 1958, pp. 82-83 and Jul-Dec 1958, p. 43; Msg ADOOP-O 0022, ADC to SAC, 20 Jan 1958 [DOC 46]; Hist of ADC, Jul-Dec 1957, pp. 85-86.

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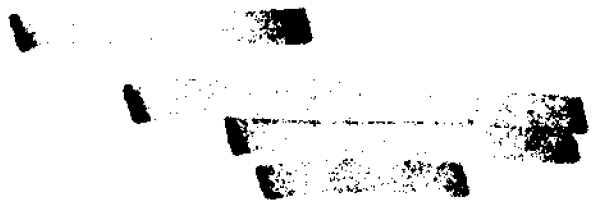

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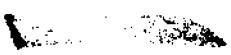

reasons of safety, under air defense conditions less than Air Defense Readiness (i.e. during periods of Normal Preparedness or Increased Readiness). Since one of ADC's primary functions was identification of aerial targets sighted on radar, which, when of significant import but of unknown origin (and unidentifiable on the ground), entailed scrambling one or both of two interceptors maintained on five-minute alert to execute visual identifications, it meant that interceptors assigned this duty must, of necessity, not be armed with nuclear armament. On the other hand, unless some suitable air defense posture, aside from that provided by ADC's mass-loading requirement, was offered, the whole purpose of the F-89J/MB-1 weapons system would be subverted. The answer, a compromise at best, lay in a partial standby alert for emergency use. In addition to maintaining two interceptors on five-minute alert armed merely with conventional (non-atomic) GAR missiles (so they could fly identification missions during periods of Normal Preparedness and Increased Readiness), two other F-89J's loaded with live MB-1's stood a 30-minute alert in alert hangars at each squadron in the interest of exploiting the maximum weapons-potential in case of attack. *

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* Actually, only one of the two F-89J's assigned 30-minute alert with two MB-1's had to have them loaded; the

[redacted]

Although certain refinements were introduced in November 1958 and later, substantially the same requirements obtained, with minor variations, for the rest of the useful lifetime of the F-89J/MB-1 in the regular interceptor force.[21]

Insofar as mating the MB-1 rocket to the F-89J interceptor was concerned, the hookup was comparitively simple. Having ample room to operate in, F-89J loading crews were practically immune to the awkward handling, slipping and fumbling situations sometimes caused by cramped working conditions in loading the later Century interceptor models. Unlike successor Century series aircraft, which contained armament bays where MB-1's and GAR-11's, together with conventional GAR missiles, were crowded into the belly of a fuselage (after considerable exertion on the part of loading crews inching them into position from crouched postures), the F-89J was armed openly, with MB-1's connected about shoulder-level above the ground. Two MB-1's on MF-9 trailers

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[Cont'd] other two MB-1's, if preferred, could be positioned on trailers in the alert hanger near their designated F-89J.

21. Hist of ADC, Jul-Dec 1957, pp. 84-85; CONAD/NORAD Hist Summaries, Jul-Dec 1957, p. 72, Jan-Jun 1958, pp. 79-81, and Jul-Dec 1958, pp. 109-13; Hist of EADF, Jul-Dec 1958, p. 123; Hist of CADF, Jan-Jun 1958, pp. 41-42, 53-54.

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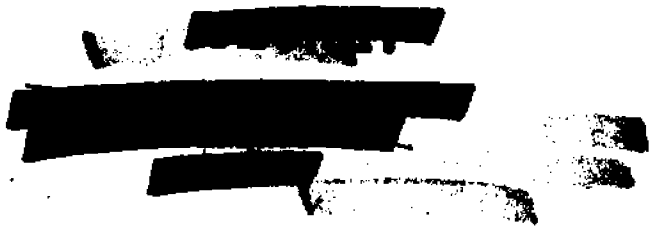

were positioned under armament pylons suspended from either wing, then raised by the MF-9 lift and mounted on launcher rails affixed to the armament pylons. Umbilical cables were connected so the MB-1 might receive electronic guidance signals and necessary power from the F-89J. Explosive bolts fastened a portion of the launcher rail to the pylon, thus enabling pilots to jettison their MB-1 rockets during flight in case they were forçed into a crash landing.[22]

F-89J Incidents/Accidents (1957-1959). Partially as a result of this roomy access for mounting the MB-1 on F-89J armament rails, personnel errors by MB-1 loading crews were practically non-existent. For the most part, the handful of reported incidents involving the F-89J in combination with the MB-1 concerned technical malfunctions and defects, most of which involved inert dummy or training versions of the MB-1 (reported for analysis and correction because of the implication that like episodes might be repeated when live "Genies" were used under similar conditions). Such an incident occurred on 3 December 1957, then thrice again in

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22. AFSWC, SWVN-58-1, op. cit., Jan 1958, pp. 10-11 [DOC 11]; Hist of EADF, Jan-Jun 1958, pp. 88-92 (pictorial sequence of MB-1/F-89J loading).

[redacted]

1958 (13 and 15 March and 28 April), when MB-1 practice rockets fitted with dummy warheads dropped off their pylon racks as the F-89J's carrying them were landing. Each mishap resulted because a rocket shear bolt snapped which, though supposedly designed to endure stresses up to three "G's" strong, failed to withstand the considerably lesser stress of alighting. On 23 July 1959, a fourth shear bolt failed.[23] Stronger ones were fabricated to replace them.

Meanwhile, starting in July 1958, another potentially dangerous situation developed when explosive jettison bolts (designed to free the F-89J of its nuclear load during in-flight emergencies) accidentally detonated, at several bases. MB-1 practice rounds were consequently released. In one instance at Ellsworth (27 May 1959), a tactical MB-1 was involved, but the MF-9 trailer stationed beneath it kept the MB-1 from dropping to the ground. On at least five different occasions F-89J jettison bolts exploded accidentally during 1958-1959. In time, it was discovered that MB-1 rocket motor heater blankets were short-circuiting and

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23. AFSWC, SWVN-58-1, op. cit., Jan 1958, pp. 2, 11 [DOC 11]; ADC, Office Chief of Safety, Project 10 Accident/Incident List 1956-1958, ca. 1960 [DOC 47]; ADC, Office Chief of Safety, Project 10A Accident/Incident List for 1959, 8 Dec 1960 [DOC 48].

[redacted]

grounding out on the rocket motor case, causing the jettison bolts to fire. After the defective blankets were singled out and replaced, the hazard from this quarter ceased existing.[24]

MB-1 SAFETY RULES

But one substantial reason no large outbreak of accidents involving the MB-1 materialized early in their operational lifetime was the creation and enforcement of iron-clad MB-1 safety rules spelling out step by step, in painstaking detail, the processes for arming interceptors with the "Genie" and protecting them from all but authorized, deliberately actuated launches. As early as 1957, as noted above, interim safety rules had been approved by the JCS for application with the F-89J/MB-1 weapons system. By early 1958, the Air Force Special Weapons Center (Kirtland AFB, New Mexico) had thoroughly tested and, aside from certain

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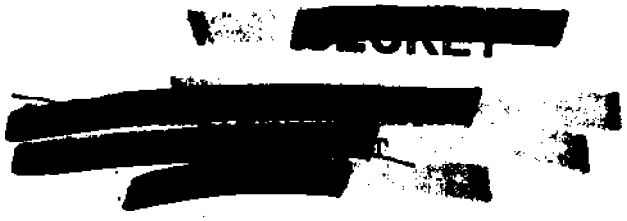
24. ADC Chief of Safety, Project 10 Accident/Incident List 1956-1958, ca. 1960 [DOC 47]; ADC, Office Chief of Safety Project 10A Accident/Incident List for 1959, 8 Dec 1960 [DOC 48]; Msg WVCT-6-6-E, AFSWC to OOAMA, 3 Jun 1959 [Doc 351 in Hist of ADC, Jan-Jun 1959]; Msg FSO 543, 54 FIS to ADC, 8 Jun 1959 [Doc 352 in Hist of ADC, Jan-Jun 1959]; Msg ADMME-CA 2497, ADC to Air Divs, 30 Oct 1959 [Doc 139 in Hist of ADC, Jul-Dec 1959]; Hist of ADC, Jan-Jun 1959, pp. 226-27 and Jul-Dec 1959 p. 133.



recommendations, endorsed as sound the F-89J/MB-1 mechanics and safety techniques so long as arming procedures were scrupulously adhered to. Similar studies of the F-101B/MB-1 and F-106A/MB-1 conducted at the Center during 1958 confirmed the basic safety of these systems -- again providing that the procedures prescribed were strictly followed. Then in August 1959, the Secretary of Defense granted interim approval to MB-1 safety rules for the F-101B and F-106A as drawn up by Nuclear Weapons Systems Safety Group (NWSSG), whereupon ADC was permitted to load "Genies" on the "Voodoos" and "Delta Darts" phasing into the Command. The F-101B and F-106A started phasing in during 1959; the F-89J fleet, while phased out of the regular force by 1960, changed hands to the ANG.[25]

Safety rules developed by the Nuclear Weapons Systems Safety Group (NWSSG) to govern MB-1/interceptor activities called for foolproof safeguards and controls for regulating

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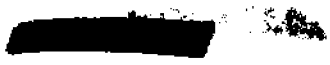
25. AFSWC, SWVN-58-1, op. cit., Jan 1958 [DOC 11]; Air Force Special Weapons Center, SWVN-58-11, Safety Study of Nuclear Weapon Suspension and Release systems of F-101B/MB-1 and F-106A/MB-1, June 1958 [DOC 49]; USAF, Nuclear Weapon System Safety Group, Final Study of the F-106A/MB-1 Weapon System, NWSSG 58-27, Dec 1958 [HRF]; USAF, Nuclear Weapon System Safety Group, Final Study of the F-101B/MB-1 Weapon System, NWSSG 58-25, Nov 1958 [HRF]; Hist of ADC, Jul-Dec 1959, pp. 134-35; Msg ADOOP-WM 12-H-14, ADC to Air Divs, 12 Aug 1959 [Doc 144 in Hist of ADC, Jul-Dec 1959]; Hist of CADF, Jan-Jun 1958, pp. 41-42.



"Genie"-armed interceptors under every situation -- while parked on the ground, flying, and preparing to land. The business of balancing nuclear air defense readiness essential to protect North America, against safety devices to prevent damage from nuclear accidents, was a delicate one. When assigned ground alert duty, MB-1 armed interceptors, were prohibited from being moved under their own power. As soon as electrical in-flight ejection rack locks were installed on the F-101B and F-106A, they were kept locked, safetied and sealed; the trigger restraining pin of the F-89J was left inserted. Until the rack locks were installed, safety pins were required on the ejector racks. During interceptor loading and down-loading operations, rocket motor igniter safety pins were left inserted to rule out any chance of the rocket motor starting prematurely. Inside interceptor cockpits, the Armament Selector switch and Arm/Safe switch were safetied and sealed. During periods of air defense readiness or high states of alert (redefined in 1960 as Defense Condition (DEFCON) 1 or Air Defense Emergency*, when

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* In April 1960, NORAD reconstituted the categories of the alert into five progressive defense readiness conditions (DEFCON's) and the Air Defense Emergency, defined as follows: DEFCON 5, normal readiness; DEFCON 4, increased intelligence watch; DEFCON 3, above normal readiness; DEFCON 2, preparations for maximum readiness, if required; DEFCON 1, maximum readiness; Air Defense Emergency, readiness to implement all air defense agreements involving civilian and military agencies.

[redacted]

MB-1 loaded interceptors at last became eligible for scrambling, procedures were carefully defined for controlling all contingencies of nuclear activity. Interceptor commanders were instructed to avoid flights over densely populated areas when possible, to break the seal on the Armament Selector Switches only after receiving confirmation that hostile aircraft were present, and when returning to base with an MB-1 still aboard, to "safety" this switch before landing (or in the case of the F-89J, reinsert the trigger restraining pin). Procedures for jettisoning nuclear rockets over predesignated water areas in case of in-flight emergencies were carefully spelled out. These and other rules were designed to maintain an effective, yet suitably safe posture requiring a deliberate, calculated effort on the part of the aircraft commander during times of emergency to launch his MB-1 armament, while precluding chances of an accidental launch on the ground or in the air. As F-106A and F-101B's obtained electrical in-flight ejection rack locks, certain restrictions were relaxed. On January 6, 1960, ADC was informed that the MB-1 safety rules as they applied to the F-89J, F-101B and F-106A, had been signed by President Eisenhower in late 1959. Refinements and changes were incorporated from time to time, but basically their

[redacted]

character remained substantially the same. Rules similar to these were issued for the F-102A/GAR-11 system at mid-1961.[26]

THE F-101B/F-106A -- MB-1

The advent of MB-1-armed Century aircraft brought in train new griefs and headaches. In place of 11 squadrons made up from an inventory of about 260 F-89J's, the regular

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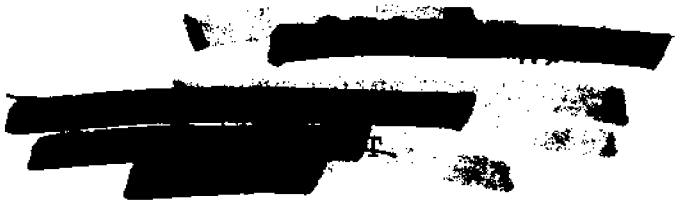
26. RESTRICTED DATA, Msg AFCIS 75416, USAF to ADC, 9 Jan 1961 [DOC 50]; RESTRICTED DATA, Msg BLACK BEAR #19, ADMME-DE 104, ADC to Air Divs, et al, 17 Jan 1961 [DOC 51]; Msg BLACK BEAR #34, ADCSA-M 349, ADC to Air Divs, et al, 15 Feb 1961 [DOC 52]; Msg BLACK BEAR #35, ADCSA-M 350, ADC to Air Divs, et al, 15 Feb 1961 [DOC 53]; Msg ADOOP-WM 3402, ADC to USAF, 22 Dec 1960 [DOC 54]; Msg AFOOP-DE 78685, USAF to AFDCF, 19 Jan 1961 [DOC 55]; Msg AFCAV 98021, USAF to SAC, 30 Aug 1961 [DOC 56]; RESTRICTED DATA, Ltr, ADCL 122-5, ADC to Air Divs, et al, "Summary of Safety Rules for the Peacetime Operation of Nuclear Weapons -- F-101B, BLACK BEAR #23, 27 Jan 1961 [Doc 589 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Ltr, ADCL 122-6, ADC to Air Divs, et al, "Summary of Safety Rules for the Peacetime Operations of Nuclear Weapons -- F-106A, BLACK BEAR #24, 27 Jan 1961 [Doc 590 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Msg AFIIS 79334, USAF to CINCNORAD, 19 Jun 1961 [Doc 591 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Msg AFIIS 83928, USAF to AFINS (Kirtland), 7 Jul 1961 [Doc 592 in Hist of ADC, Jul-Dec 1961]; Hist of ADC, Jul-Dec 1959, pp. 134-36; Msg AFCFN-N 60833, USAF to ADC, 6 Jan 1960 [Doc 146 in Hist of ADC, Jul-Dec 1959]; Hist of ADC, Jan-Jun 1960, pp. 126-30; ADCM 136-1, ADC Munitions Technical Manual Weapons Loading Management, 1 Nov 1962 [HRF]; Hist of ADC, Jul-Dec 1961, p. 246; Hist of ADC, Jan-Jun 1959, pp. 228-29; Hist of WADF, Jan-Jun 1960, pp. 65-66; NORAD/CONAD Historical Summaries, Jul-Dec 1959, p. 58 and Jan-Jun 1960, pp. 38-39.



force employing the MB-1 gradually grew to 17 squadrons of the F-101B and 14 of the F-106A drawn from an inventory approaching 400 "Voodoos" and 250 "Delta Darts" -- considerably more than twice the number as before. Accordingly, the quantity of MB-1's in use and the amount of activity involving them could not help but multiply. Each F-101B squadron was authorized 148 MB-1's; each F-106A squadron, 107 of them. While storage, testing, and handling facilities and methods were generally the same, the loading and unloading chores considerably worsened. Unlike the F-89J which was armed openly at shoulder level (as described above), the F-101B and F-106A contained armament bays within the fuselage, about waist-high above the ground, calling for loading crews to squat and arm them from crouched positions in working space that, at best, was cramped. When nuclear fledged F-102A's later joined the inventory, they, too, exacted similar hardships from GAR-11 loading crews.[27]

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27. Hist of ADC, Jul-Dec 1961, p. 175; Msg ADMAC-CA 383, ADC to WADF, 25 Feb 1958 [DOC 29].

To illustrate this problem, F-101B loading crews originally faced considerable difficulty aligning the MF-9 trailer, together with its MB-1 load, beneath the proper rack destined to receive the "Genie." That the crews, often as not, were racing against the clock during mass-loading exercises did not serve to help matters, either. Their work-area vision thus obscured by the aircraft's close proximity to the ground, the crews later found it profitable to compensate by painting guidelines on certain portions of the aircraft for matching the position of the MF-9 trailer in proper relation to the ejector rack.[28]

The F-101B carried for primary armament two MB-1 rockets mounted side by side on ejector racks attached to a hydraulically actuated rotary armament door. Two forward lugs and one aft lug on each MB-1 secured the weapon to hooks on the rack. As discussed later, this hookup system was to give rise to a number of problems. Electrical in-flight ejector rack locks were subsequently developed and, by 1962, applied to the F-101B, as well as to the F-106A, as further surety that the MB-1 mounting lugs would not become detached prematurely and allow the MB-1 to fall. When

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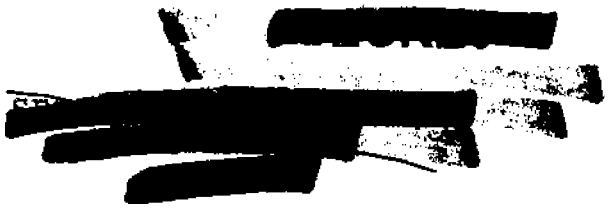
28. ADCM 136-1, op. cit., 1 Nov 1962, p. 63 [HRF].



loaded with two MB-1's, the F-101B armament door was flipped so that the "Genies" were carried internally. Hence, before they were automatically launched by the MG-13 fire control system of the F-101B, the armament door was rotated 180 degrees to place them in proper firing position. Secondary armament for the F-101B was comprised of either two GAR-1D's or two GAR-2A's.[29]

The F-106A could only deliver one MB-1 per flight, which was fastened to an ejector rack mounted in the center of the aft section of the F-106A armament bay. The F-106A's MA-1 aircraft and weapon control system automatically triggered the MB-1 at the critical moment. The F-106A secondary armament numbered four conventional GAR-3A/4A falcons.[30]

Rocket Motor Problem. Introduction of the F-101B and F-106A raised again a rocket motor problem that had troubled the MB-1 long before. While the original military characteristics for MB-1 rocket power had called for a motor

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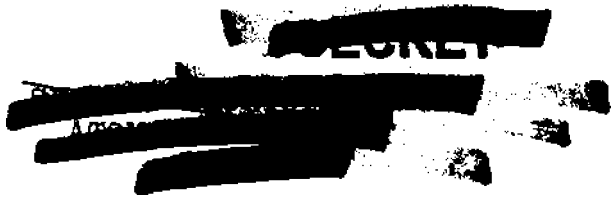
29. ADCM 27-8, op. cit., 15 May 1958 [HRF]; AFSWC, SWVN 58-11, op. cit., Jun 1958, pp. 33-34 [DOC 49]; ADCM 136-1, op. cit., 1 Nov 1962, pp. 63-70 [HRF].

30. ADCM 136-1, op.cit., 1 Nov 1962, pp. 97-107 [HRF]; AFSWC, SWVN 58-11, op. cit., Jun 1958, pp. 63-64 [DOC 49]; ADCM 27-10, Program Control Plan F-106, 22 Jun 1960 [HRF].

capable of operating from -65 degrees to +160 degrees Farenheit, the MD-1 Aerojet motor actually developed in 1955-56 only qualified for use between the temperatures of -20 degrees and +140 degrees. A heating blanket containing thermostatic controls was incorporated in the rear of the MB-1, therefore, to encircle the Aerojet motor and warm it in winter when connected to the heater circuitry of the F-89J. As long as the MB-1 was mated to the F-89J, cold weather would not bother it.

But the story changed when the F-101B and F-106A entered the scene, because neither of them was equipped with heating circuitry for warming the MB-1 heater blanket during cold weather. It was not uncommon for temperatures to drop during mid-winter to the minus 40's and 50's, particularly at bases near the northern border like Glasgow, Grand Forks, Loring, Duluth and Dow. Experiments were therefore carried out to develop substitute rocket motors conditioned to withstand extreme temperatures considerably lower than the -20 degrees the Aerojet motor was good for. The Thiokol Corporation, by 1959, had developed one capable of operating down to -40 degrees, while Aerojet General designed another that test-fired on six occasions at -75 degrees. But for various reasons, neither of these two proved suitable and the



development contract then in force was cancelled near the end of 1961. ADC, nevertheless, pressed the issue vigorously, stressing the importance of acquiring an MB-1 motor operable during extreme cold, preferably to -75 degrees. Meanwhile, the MC-1 and MD-1 portable blower heaters were successfully tested in 1960 so that in wintertime, they were wheeled out to MB-1 armed F-101B's and F-106A's standing alert, then positioned to funnel a stream of hot air into armament bays for purposes of warming the "Genies."[31]

In 1961, OOAMA, after conducting tests on the Aerojet MD-1 motor still in use concluded that even the -20 degree capability of the MD-1 had been wrongfully optimistic, and that 0 degree Farenheit was about the lowest temperature that MD-1 propellent would fire. The positive low-operating limit was accordingly re-adjusted to zero degrees, necessitating surveys of storage bin temperatures during winter time conditions, and a modification to enable MB-1's to be

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31. AFSWC, SWVN-58-1, op. cit., Jan 1958, p. 9 [DOC 11]; Msg ADMME-DE 2307, ADC to AFSWC, 19 Oct 1961 [DOC 57]; Msg SWVCT 27-10-74, AFSWC to ADC, 27 Oct 1961 [DOC 58]; Msg ADMME-DE 2481, ADC to AFSWC, 7 Nov 1961 [DOC 59]; Msg ADMME-DE 2633, ADC to AFSWC, 24 Nov 1961 [DOC 60]; Msg SWVCT 8-12-9, AFSWC to ADC, 8 Dec 1961 [DOC 61]; Msg ADMME-EB 2654, ADC to RCAF, 9 Jul 1963 [DOC 62]; Hist of ADC, Jan-Jun 1959, p. 276; Hist of ADC, Jul-Dec 1960, pp. 246-47.

kept warm enough while in storage. Where the surveys showed a need for storage area temperature control, step-down transformers were placed in MB-1 storage bins during the winter of 1961-62 to feed low voltages into the MB-1 heater blankets. Consequently, the "Genie" whether in storage or on an alert interceptor, was protected against the sub-zero temperatures that might render its rocket motor inert. In 1963, hope was restored that a replacement motor was in the offing as word filtered down that OOAMA had consummated a development contract for another MB-1 rocket motor.[32]

Tactics were painstakingly worked out so the F-101B and F-106A interceptors followed the most advantageous approach to target for exploiting interceptor, FCS and MB-1 capabilities against hostile bombers. Beginning in 1959, the 4750th Test Squadron at Tyndall experimented with the various feasible attacks, codifying the results in ADCM 55-5

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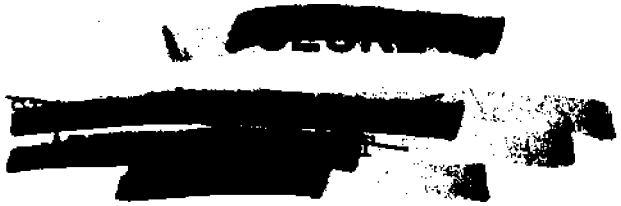
32. Interview w/Maj E.A.Rogers, ADMME, 29 Oct 1963; Msg ADMME-DE 1177, ADC to OOAMA, 6 Jun 1961 [DOC 63]; Msg ADMME-DE 1433, ADC to OOAMA, 10 Jun 1961 [DOC 64]; FORMERLY RESTRICTED DATA, Msg ADMME-DE 2684, ADC to OOAMA, 30 Nov 1961 [DOC 65]; Msg ADMME-DE 2140, ADC to OOAMA, 3 Oct 1961 [DOC 66]; Msg ADMME-DE 2523, ADC to Air Divs, 9 Nov 1961 [DOC 67]; Msg ADMME-DE 2533, ADC to OOAMA, 13 Nov 1961 [DOC 68]; Msg ADMME-DE 2616, ADC to 25 AD, 22 Nov 1961 [DOC 69]; Msg ADMME-DE 13 ADC to Air Divs, 3 Jan 1962 [DOC 70]; Msg 30-MME-D S-296-62, 30 AD to ADC, 31 Jan 1962 [DOC 71].



standard tactics manual. The preferred basic attack ultimately decided on called for an approach off the target's stern, unless the target possessed a speed or altitude advantage. Escape maneuvers were also perfected to allow F-101B and F-106A aircrews to evade the aftermath of the MB-1 nuclear explosion.[33]

As with the F-89J, the MB-1 figured prominently in F-101B/F-106A mass-loading requirements and in their alert commitments. Furthermore, in 1961, another issue -- that of dispersal involving more MB-1 activity -- was ushered into the air defense picture. Actually all three elements -- the mass-loading requirements, the alert posture, and dispersal -- were closely interrelated, with the latter two particularly depending on each other. They aimed to constitute the regular force into versatile weapons system capable of surviving early wave ICBM attacks, then cope with ensuing waves of hostile manned bombers. As regards mass-loading goals, ADC enjoined F-101B/F-106A interceptor units

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33. Hist of ADC, Jan-Jun 1959, pp. 222-24; Hist of ADC, Jul-Dec 1959, p. 131; Hist of ADC, Jan-Jun 1960, pp. 130-32; Hist of ADC, Jul-Dec 1960, pp. 179-81; Hist of ADC, Jul-Dec 1961, pp. 274-77; ADCM 55-5, 1 Jan 1963 [HRF]; Msg ASNDSL-16-7-23, ASD to ADC, 16 Jul 1963 [DOC 72]; Msg ADOTT-D 2805, ADC to ASD, 26 Jul 1963 [DOC 73]; Msg ADOTT-D 2834, ADC to Air Divs, 29 Jul 1963 [DOC 74].

to demonstrate, with little or no advance notice, a capability to arm all operationally ready aircraft (excepting those committed to an early alert) with primary and secondary armament within one hour during normal duty hours. At least one mass-loading training exercise per unit was to be conducted each month. By the same token, these same units were supposed to strive for a fifteen-minute turnaround capability resulting in five aircraft being simultaneously rearmed with MB-1 and secondary armament, refueled and otherwise reserviced for another mission within one quarter hour after "landing" following a previous mission. The goal of a 15-minute turnaround, long sought by both ADC and USAF, had lapsed into abeyance while the MB-1/F-106A and F-101B weapons combination were yet new and the loading crews handling the MB-1 inexperienced. In late 1960, it was reinstated as a goal to achieve so long as safety standards were not sacrificed in the process, which conceivably might lead to detonation of an MB-1 and disaster for the MB-1 armed unit. By 1962, turnaround crews were expected to have gained experience enough to accomplish the turnaround in 15-minutes time with only minor exceptions. In addition, each F-101B and F-106A squadron gradually worked up to achieve a limited mutual turnaround capability starting in

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1961, so that by 1962 each F-101B squadron was expected to be capable of reservicing and providing MB-1 armament for four F-106A's and vice versa, preferably within a half-hour's time. As of September 1963, this mutual turnaround requirement was reduced from four to two interceptors of the opposite number.[34]

Meanwhile, beginning in 1961, at USAF's bidding ADC developed a dispersal plan calculated to save the interceptor force from annihilation by a sudden shower of first and second-wave enemy ICBM's. The dispersal concept was destined to manifest considerable impact on the conventional alert commitment, in the course of which activities involving the MB-1 and GAR-11 were drastically stepped up. Secondary dispersal bases were picked for most squadrons of the regular interceptor force, where one-third or more of a squadron's interceptors, armed with primary armament, could deploy when warned of an impending ICBM attack, presumably to escape

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34. ADCR 55-9, Armament Loading Capability, 1 May 1962 [DOC 75]; Hist of ADC, Jan-Jun 1960, pp. 129-30; Hist of ADC, Jul-Dec 1960, pp. 204, 219; Hist of ADC, Jan-Jun 1961, pp. 176-77; Msg ADMME-DE1116, ADC to 25 AD, 24 Apr 1962 [DOC 76]; RESTRICTED DATA, BLACK BEAR #185, Msg ADOOP-WM 1308, ADC to Air Divs, et al, 10 May 1962 [DOC 77]; Msg ADOOP-WM 4004, ADC to Air Divs, 4 Sep 1963 [DOC 78].

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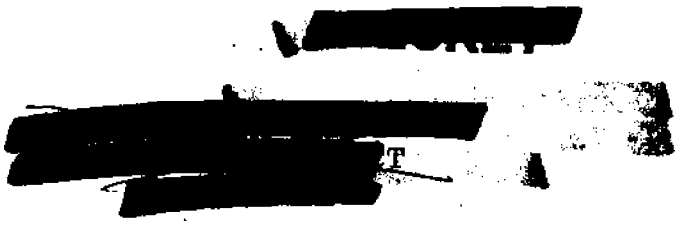
obliteration thereby. Eventually, dispersal bases were to house permanent contingents from parent squadrons on a rotational basis, and house sufficient nuclear and conventional armament to equip them for a series of missions.

Anticipating future nuclear storage needs at dispersal bases, ADC engineers designed a new type of multiple-cell magazine that was comparitively inexpensive in cost and, following a detonation test conducted in April 1963, proved promising for confining damage from explosive propagation to the cell of original detonation. The cells were made of an arch of medal resting on a concrete foundation, and were covered by a layer of earth two feet thick over their tops. Each cell was separated from the others by a minimum of 16.5 feet, with fill dirt sandwiched in between. Additional tests of the storage cells were scheduled for late 1963. Meanwhile, to further protect from explosive propagation the tactical MB-1's then in storage at home bases, sandbag barricades were ordered at ADC's direction in mid-1962 and, upon delivery, stacked inside the center cells of existing MB-1 storage magazines. At the same time ADC was experimenting with new MB-1 storage magazines for dispersal bases, the command was also casting around for authorization to lengthen the 30-day inspection interval for



alert MB-1's at dispersal bases to 60 days, and to allow certain MB-1 inspections to be performed at dispersal sites. But as of mid-1963, ADC still awaited approval.

It was clear that the traditional alert commitment* could not possibly satisfy the demands of the dispersal concept. Obviously, serious readjustments were demanded to expand the size of interceptor alerts before one-third or more of a squadron's interceptors could disperse with only fifteen minutes advance notice. In February 1962, therefore, an increased alert posture was implemented. Interceptor squadrons of the regular force placed one-third of all possessed tactical aircraft on a 15-minute (or less) alert status, with two of them as before, standing five-minute alerts armed with non-nuclear secondary missiles, while all others in the alert contingent were armed with both primary and secondary armament. Because of the greater workloads and round-the-clock operations thrust on weapons loading crews to meet the demands of increased alert, thereby reducing the number

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* The traditional alert called for two interceptors armed solely with secondary non-nuclear missiles standing 5-minute vigils and readied for scrambling on identification missions against unknown targets; two others armed with primary nuclear armament served on backup alert for emergency action against known hostiles once DEFCON 1 or an Air Defense Emergency was declared.

of crews on hand at any one time, ADC doubled the time allowed them during mass-loading exercises, permitting them two hours, instead of one to equip all operationally ready interceptors with primary and secondary armament, excepting the two interceptors assigned the 5-minute, identification alert. "Genie"-armed interceptors were still prohibited from flying, however, unless either Defense Readiness Condition (DEFCON) 1 or an Air Defense Emergency was declared, according to regulations. While denied this privilege by regulation, actual dispersal of interceptors armed with MB-1's and GAR-11's was ordered by CINCONAD (upon receiving JCS authorization), and subsequently carried out during the Cuban crisis of October 1962, despite a DEFCON that never rose to the gravity of a DEFCON 1 situation calling for maximum readiness.* In all, 169 nuclear-armed interceptors from 28 squadrons (about one-fifth of the regular interceptor force) deployed to 16 dispersal bases -- the first time ADC interceptors were permitted to fly armed with atomic weapons. So that dispersed interceptors could stand alerts at dispersal bases where less space was available than stipulated by regulations, ADC granted interim waivers

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* DEFCON 3 was the highest number reached during the Cuban crisis.

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to quantity-distance criteria permitting nuclear-loaded interceptors to be bunched more closely together. During the period of the Cuban quarantine, lasting from 22 October to December 1962, the handling and loading of nuclear weapons multiplied many times more than usual. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

Yet not a single serious accident occurred that involved an MB-1 or a GAR-11 -- a dramatic tribute to the efficacy of the nuclear safety program.[35]

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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The interceptor dispersal thus ordered and successfully implemented during the Cuban crisis focused attention again on several privileges ADC had been seeking which entailed loosening the safety rules a notch or two. It seemed only reasonable to ADC that "Genie" loaded interceptors on 15-minute alert should be given the right to taxi under their own power so their reaction capabilities to dispersal orders could be properly evaluated. In April 1963, ADC obtained authorization to taxi MB-1 armed alert aircraft providing suitable obstacles were situated to prevent unauthorized takeoffs. For various reasons, this was found impossible to fulfill at all bases, so at mid-1963 ADC was prepared to relinguish the taxiing concept as long as the right was retained to start the engines of these alert-duty interceptors. Perhaps more important was ADC's wish that F-101B's and F-106A's be permitted to flight-ferry their tactical MB-1's between home and dispersal bases, as directed by CONAD even during periods of normal readiness (DEFCON 5), for purposes of testing and implementing

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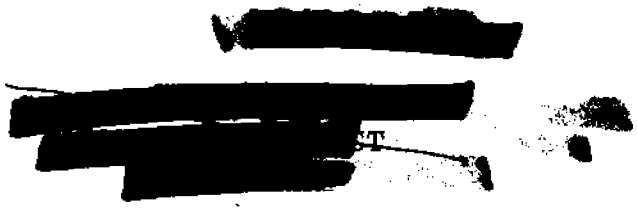
[Cont'd] [DOC 89]; Msg ADMME-EB 847, ADC to OOAMA, 20 Mar 1963 [DOC 90]; FORMERLY RESTRICTED DATA, Msg ADMME-EC 1858, ADC to OOAMA, et al, 16 May 1963 [DOC 91]; Msg ADMME-EB 2030, ADC to 28 AD, 4 Jun 1963 [DOC 92]; ADC Munitions Bulletin, No. 63-4, 15 Apr 1963 ,[DOC 93].



the requirements of dispersal. For safety's sake, the rocket motor igniter would be disconnected to preclude an unauthorized launching of an MB-1 being ferried. Furthermore, ADC eagerly sought the right to scramble MB-1 armed interceptors for identification and dispersal missions, under the aegis of CONAD, at the DEFCON 3 instead of the DEFCON 1 level. As of mid-1963, however, ADC still awaited approval from higher authority.[36]

Just how did the Command manage to operate with nuclear weapons so long without one major atomic accident? Seven years skipped by without a nuclear catastrophe -- that most decisive of all criteria for judging the success or failure of the program. One answer, of course, lay in the technological safeguards perfected for and incorporated in each weapon -- the self-contained "one-point safe" network inside each rocket together with finely-tooled paraphernalia placed in interceptors so that a certain sequence of positive actions was necessitated to launch and energize the weapons, as described above. But, more than this was required to keep down an accident rate that potentially

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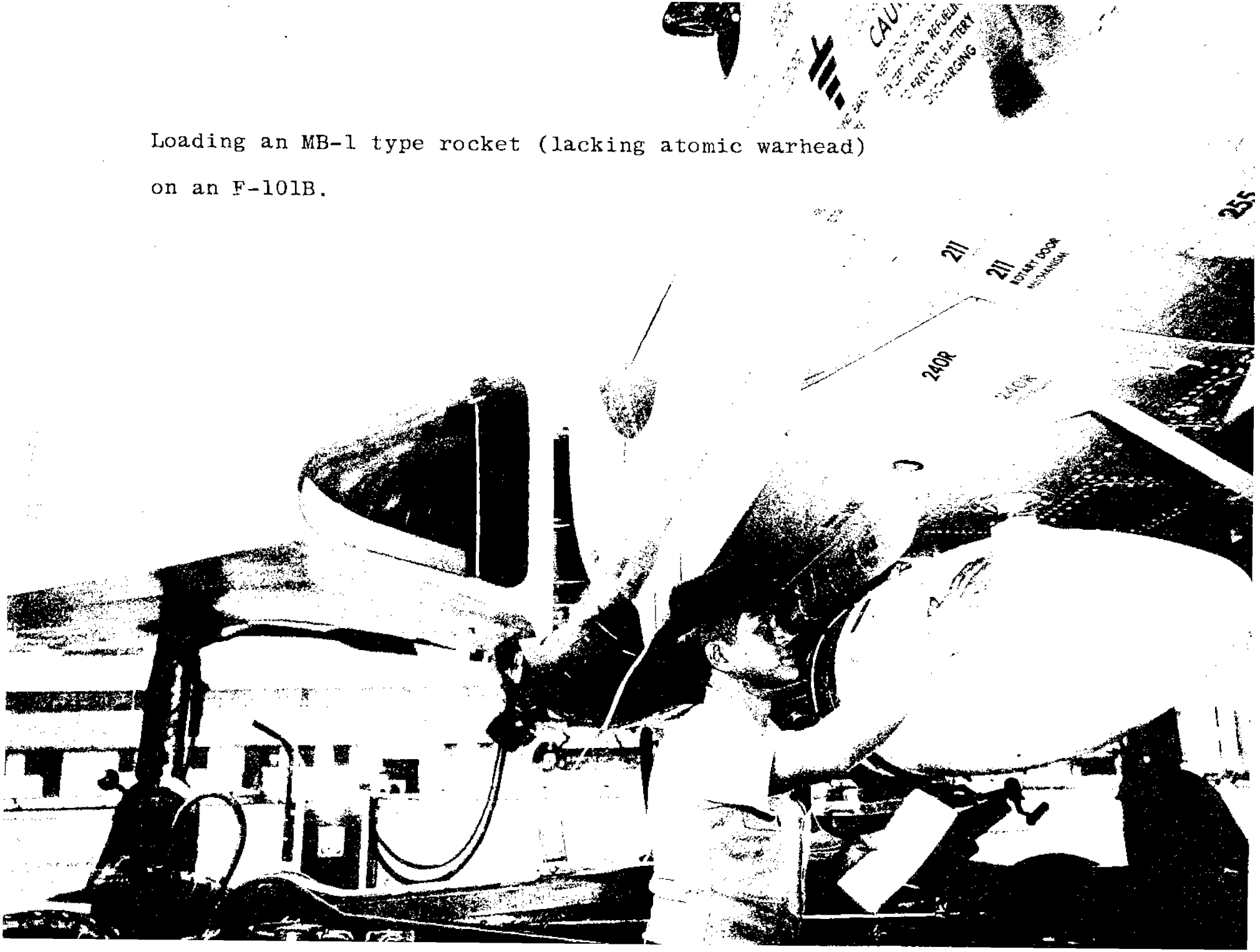
36. RESTRICTED DATA, AFR 122-36A and 35A, 29 Apr 1963; Interview w/Maj K.M. Kirchofer, 23 Oct 1963; Msg ADOOP-WM 1994, ADC to Air Divs, 29 May 1963 [DOC 93A]; Msg ADOOP-WM 2881, ADC to USAF, 6 Aug 1963 [DOC 94].

Loading an MB-1 type rocket (lacking atomic warhead) on an F-101B.



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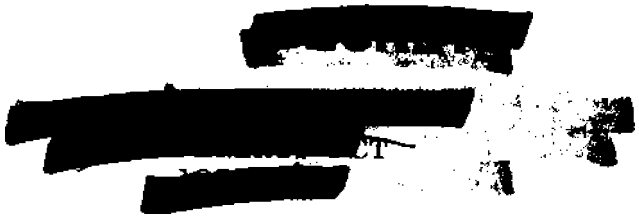
could get out of hand by virtue of the multitude of weapons and crewmen, and their bustling activity. Admittedly, several incidents did occur, as described later herein, which in some cases may have come close to serious accidents. But, considering the size of the inventory and the operations, remarkably few resulted. The number of nuclear episodes smacking of very real danger, contrary to expectations, surprisingly decreased as the quantity of nuclear weapons and the amount of their activity increased.

TIGHTENING NUCLEAR CONTROL

The safety and success of the nuclear armament program was traceable in large part to the groundwork laid for controlling the conduct of this activity, including application of the safety rules approved by USAF, DOD, JCS and the President. In preparation for integrating F-101B/F-106A-MB-1 weapons, IM-99A/B BOMARC missile units, and F-102A/GAR-11 squadrons, and in anticipation of the inevitable hike in nuclear activities that the introduction of these systems would generate, ADC established a Directorate of Missile/Nuclear Safety under the Chief of Safety in late 1958, not long after USAF had created the Nuclear Weapon System Safety Group (NWSSC) headquarters at Kirtland AFB, New Mexico.



From that time on, control over nuclear matters was gradually strengthened and enlarged, both at headquarters ADC and in the field. In the spring of 1959, the "buddy system" (later redesignated the "two-man" concept) was ordered implemented at all tactical units employing nuclear armament, so that at least two qualified individuals would always be on hand when access to a nuclear warhead was required. This guaranteed that any mentally deranged persons or saboteurs who somehow gained access to a warhead would not be with it alone and unobserved. About this same time, MB-1 Assembly and Loading Teams were organized by Air Training Command to visit ADC tactical units for familiarizing them with MB-1 handling procedures. Mass-loading exercises were encouraged. Check lists and directives were published and disseminated regularly and frequently, and Base Nuclear Accident Response Teams were drilled. In the autumn of 1959, USAF focused anew on the importance of nuclear safety by making it a special subject for inspection. Tactical units employing nuclear weapons were subjected to rigorous, comprehensive inspections at least once every 18 months. Inspections were conducted by special teams representing the Inspectors General of either ADC or USAF. Tactical weapons were employed during mass-loading phases

of the test. In late 1959 and 1960, a full-time, qualified missile/nuclear safety officer was authorized for each defense force, division and tactical unit using nuclear ordnance. In addition to monitoring compliance with ADC's safety directives, technical orders and check lists, these safety officers were expected to prepare training literature pertaining to missile/nuclear safety. Procedures were established for reporting accidents or incidents affecting nuclear armament.[37]

But this was still not enough. Surveys and inspections conducted during 1960 revealed that information and directives pertaining to nuclear arms were not reaching all pertinent channels up and down the line, that weapons handling proficiency (for which F-89J squadrons had achieved

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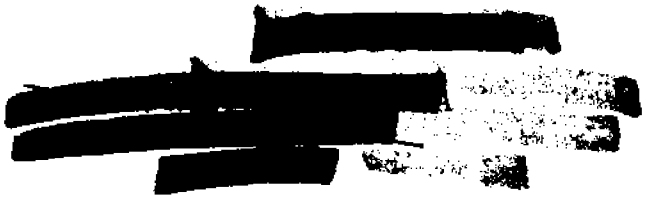
37. ADCR 122-1, "Missile/Nuclear Accident Prevention," 2 Jan 1961 [Doc 578 in Hist of ADC, Jul-Dec 1961]; AFR 122-1, "Responsibilities for Nuclear Safety Accident and Incident Prevention Programs," 15 May 1960; ADC Suppl 1 to AFR 58-4, "Responsibilities for Missile Accident Prevention Programs," 8 Feb 1961; Ltr, Chief of Safety ADC to Cmdr ADC, "Reorganization of the Chief of Safety," 9 Oct 1961 [Doc 579 in Hist of ADC, Jul-Dec 1961]; Ltr, ADC to WADF, "Guidance-Missile/Nuclear Safety Officers," 11 Jan 1960 [Doc 580 in Hist of ADC, Jul-Dec 1961]; Hist of ADC, Jan-Jun 1959, p. 224; ADCR 55-28, op. cit., 14 Jun 1962 [DOC 80]; AFM 122-1, op. cit., 15 Sep 1961, pp. 1-2 to 1-3 [HRF]; Hist of CADF, Jan-Jun 1959, pp. 51-52; Hist of WADF, Jan-Jun 1959, p. 79; Hist of WADF, Jul-Dec 1959, pp. 87-89; Hist of WADF, Jan-Jun 1960 pp. 59-60.



a high and stable reputation), was wanting for Century model interceptor systems because of their newness, and that uniformity and standarization among units for accomplishing the storage, handling, maintenance and loading activities left much to be desired despite the existence of check lists, technical orders (T.O.'s) and directives spelling out each successive step in detail.

Several innovations were introduced, therefore, in late 1960-early 1961. For one thing, the "Black Bear" communications system was adopted to transmit instructions to pertinent units in the field. Until ADC could codify in regulations and manuals the policies and procedures regarding the storage, assembly, maintenance, handling, loading and safety of nuclear weapons, written communications discussing these subjects were designated "Black Bear" documents which were given preferential treatment assuring rapid, direct automatic distribution. Consequently, the time lag between the period when orders were issued and implemented was reduced to a fraction of what once had obtained. The "Black Bear" communications system had particular significance in the light of the command's nuclear safety policy, expounded by Lt General Robert M. Lee, ADC Commander, in 1961:[38]

Safety is paramount in all activities involving

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38. "Black Bear" Msg 65, n.d., but about May 1961

> nuclear weapons. The written instructions and procedures which govern these activities are designed to achieve absolute safety. Therefore, rigid, detailed compliance with these instructions and procedures is mandatory. Perfection is the only acceptable standard.

To instill disciplined, unequivocal compliance to accepted, standardized methodology, a series of ADC technical manuals in the -136 series was formulated, published and accordingly delivered to proper units to serve as dogma on matters of nuclear activities. The field training program, thoughtfully composed to cover every facet of nuclear activity, was intensified, while a carefully prepared interceptor weapons launcher checkout program, requiring frequent periodic checks, was aggressively pursued. As a further guarantee that storage, maintenance, handling and loading operations were systematically standardized on a command-wide basis, a six-man "Bear Cat" Munitions Standardization Team was organized at ADC in December 1960 and began visiting field units in 1961. In the middle of 1961, the team was

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[Cont'd] [DOC 95]; Col W. Comstock, Dep Dir of Maint., ADC, "Nuclear Safety in Air Defense Command," United States Air Force Nuclear Safety (published by Directorate of Nuclear Safety, Kirtland AFB, N.M.), Vol IX (Mar 1962), pp. 24-25, [DOC 96]; ADCR 11-5, "Black Bear" 15 May 1961 [Doc 581 in Hist of ADC, Jul-Dec 1961]; ADC HOI 11-20, "Black Bear," 15 May 1961 [Doc 582 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 2256, ADC to USAF, 14 Oct 1961 [Doc 583 in Hist of ADC, Jul-Dec 1961].

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assigned the added task of assuring standardized operations involving conventional weapons as well as nuclear weapons. The team, drawn from both DCS/Materiel and Chief of Safety, visited a number of Air National Guard squadrons as well as the squadrons of the regular interceptor force. In February 1962, the "Bear Cat" team was expanded into two ADC Command Assistance Teams (ADCAT), which persevered in making the rounds of tactical units for insuring the uniformity and systemization of the various weapons functions. Meanwhile, in mid-1961, the ADC Munitions Bulletin was inaugurated by the Maintenance Directorate to transmit, on a monthly basis, helpful advice, suggestions and informal information regarding nuclear armament to the tactical units.[39]

Evidence of ADC's continuing close attention to matters of this kind was manifested with the creation, in May 1961, of a Missile/Nuclear Safety Council. The Council

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39. Col Comstock, "Nuclear Safety in ADC," op.cit., Mar 1962, pp. 25-29 [DOC 96]; ADCR 136-3, "Munitions Standardization Team," 14 Jul 1961 [Doc 585 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Presentation to Missile/Nuclear Safety Council, ADMME, "Bear Cat Standardization Team," 4 Aug 1961 [Doc 586 in Hist of ADC, Jul-Dec 1961]; ADC Munitions Bulletin No.62-2, 15 Feb 1962 [DOC 97]; ADC, ADMME-E, "ADC Munitions Bulletin," 1 Jun 1961 [DOC 98]; ADCR 52-1, MB-1 Assembly and MB-1 and GAR Loading Training, 1 May 1961 [HRF]; ADCR 52-1 op.cit., 15 Jul 1962 [HRF]; ADCR 66-2, ADC Interceptor Weapons Trainer Checkout Program, 8 Aug 1962 [DOC 99].

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was headed by the Chief of Staff, ADC, and included the Chief of Safety, Chief of Weapons Systems Safety Division, Command Inspector General, Command Surgeon, Command Director of Information, and the Assistant Deputy Chiefs of Staff for Operations, Materiel and Personnel. The Council was charged with "assisting and expediting the solution to problems that have Missile/Nuclear Safety implications, and... [insuring] the safest operation in every phase of nuclear weapons...." As a result of the combined efforts of the Council, the Weapons Systems Safety Division and its accident/incident analysis program, the "Bear Cat" and "ADCAT" teams, the safety officers in the field, the USAF and ADC Inspectors General, plus the ADC Munitions Bulletin and the "Black Bear" communications system, a conspicuous reduction resulted from year to year in the accident/incident rate involving nuclear weapons in proportion to the increasing amount of activity. During calendar year 1962, for example, movements involving GAR-11 types were reported at 3,000, while those involving MB-1 types numbered 90,000! Despite the growing number of weapons integrated into the Command's resources, the one-third interceptor alert posture assumed in 1962, the dispersal with nuclear armament during the Cuban crisis, and the ANG alerts using MB-1 armed F-89J

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starting in late 1962 -- all of which added up to a formidable rise in accident exposure -- a decrease in incidents/ accidents occured.[40]

Lt General Herbert B. Thatcher, shortly after assuming command of ADC in August 1963, endorsed the following policy for application by the Command as regards responsibility for nuclear safety:[41]

> Every command echelon in ADC is charged with the responsibility for nuclear safety. However, the primary and basic command responsibility rests squarely on the squadron commander. In turn, direct responsibility for supervision and for work performance rests squarely on every officer, non-commissioned officer and airman for their specific area of supervision and/or specific functional task.
>
> The responsibility of the ADC commander is to insure that each individual clearly understands and discharges his responsibilities. This means that each individual who fails to do so, according to the standard cited herein, will be identified and specific corrective action will be taken in each case. It is expected that all personnel will fully discharge their responsibilities in achieving this goal.

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40. ADC HOI 122-1, "Missile/Nuclear Safety Council," 25 May 1961 [Doc 587 in Hist of ADC, Jul-Dec 1961]; IOC, ADCSA-M to Member, Missile/Nuclear Safety Council, "Minutes of Missile Nuclear Safety Council Meeting," 10 Aug 1961 [Doc 588 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-EB 396, ADC to AFSWC, 6 Feb 1961 [DOC 100].

41. ADC Policy Directive, Air Defense Command Policy for Nuclear Safety, signed by Lt Gen Herbert Thatcher, ca. Sept 1963 [DOC 101].

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GAR-11/F-102A

In the midst of all this activity emerged the F-102A/GAR-11 nuclear force. Beginning in November 1960, the F-102A fleet (in use since 1956) was subjected to the Figure 7/GAR-11 modification program so the F-102A, like the F-101B and F-106A, would also have a nuclear capability. Airframe changes (USAF No. 976) were incorporated in 1960-61, therefore, to rig the F-102A for carrying two GAR-11's,* fastened to two ejector racks mounted in the fore and aft section of the F-102A armament bay. By the end of 1961, all but two of the F-102A squadrons had obtained the necessary changes. In all, about 200 F-102A's were involved. Each F-102A squadron (reduced from 11 to 9 in 1963) authorized GAR-11's was assigned 136 of the nuclear missiles. Not till October 1963 was the F-102A squadron based at Goose granted permission by Canada to store tactical GAR-11's.

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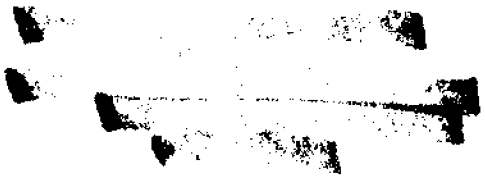
* An optional armament load for the F-102A called for one GAR-11 together with secondary armament of three GAR-2A's or three GAR-1D's. For a brief time in 1959-60, the GAR-11 was contemplated for use with the F-101B and F-106A in place of their MB-1 primary armament; but the idea was discarded, among other reasons, because of conversion costs involved. Another proposal to construct a different nuclear Falcon missile especially for the F-106A, identified as the GAR-3B, had been turned down in 1959.



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The 57th FIS flying F-102A's at Keflavik, transferred to ADC in 1962, was programmed for the GAR-11 modification in January 1964. Meantime, a conventional continuous rod H.E. warhead was developed, and in 1962 successfully tested, that would fit the missile -- designated GAR-11A. But ADC, as of mid-1963, had not stipulated a requirement for ordering this non-nuclear version.[42]

The roots of GAR-11 development were traceable to a decision made in 1956 not to reconfigure the F-102A, then in production, so it could carry the MB-1, as previously proposed. A later decision to reduce the number of F-106A's to be produced forced a prolongation of the F-102A's effective life span in the tactical inventory, giving rise once more to thoughts of arming the F-102A fleet with nuclear ordnance. When General Curtis E. LeMay (then Vice Chief of Staff, USAF), in December 1957, expressed a desire to see the Falcon missile fitted with an atomic warhead, ADC needed no further

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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encouragement. Within months Hughes was awarded a development contract; by 13 May 1958, a prototype was ready for testing and the first unguided firing was conducted, followed nine days later (22 May) by the first guided firing of a GAR-11, as it came to be known. The JCS approved development of an atomic warhead for the missile the same month. (b)(3):42 USC § 2162 (b)(3):42 USC § 2162 (Atomic Energy Act of 1954) DOE b(3) (b)(3):42 USC § 2162 (Atomic Energy Act of 1954) February 1960 was originally established as the target date for GAR-11 operational readiness; but unlike the MB-1, the GAR-11 was not destined to meet its deadline.[43]

Extensive testing of the GAR-11 began in the late summer of 1959. Category I testing (conducted primarily by

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[Cont'd] 984, ADC to Air Divs, 11 Apr 1962 [DOC 105]; Msg ADMME-DB 1291, ADC to 25 AD, 9 May 1962 [DOC 106]; Msg ADOOA 2065, ADC to USAFE, 3 Aug 1962 [DOC 107]; Msg ASZDGW-28-11-41 ASD to AFSC, 28 Nov 1962 [DOC 108]; Msg ADMME-D 3543, ADC to 29 AD, 26 Dec 1962 [DOC 109]; Msg ADOOP-WM 1740, ADC to 26 AD, 3 May 1963 [DOC 110].

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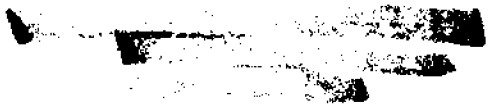

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the contractor) started eventfully when seven accurate GAR-11 hits were scored out of the first seven tries. Any missile passing within 185 feet of the target was considered a hit, because the GAR-11 contained a proximity fuze and would, in tactical use, carry a nuclear warhead. The eighth try, however, made on 10 August 1959, missed the target when the fuze was prematurely triggered. The next five test missiles, launched between 15 September 1959 and 4 March 1960, passed within lethal range of the target destruction. The 14th Category I launching, made on 20 April 1960, was unsuccessful when the missile failed to guide properly because of a faulty micro switch in the launch rail. The three subsequent tests -- 2, 9 and 20 May 1960 -- produced hits. A malfunctioning MG-10 fire control system caused failures on 10 and 27 June. Between 3 August and 6 December 1960 another 20 Category I GAR-11's were launched, 16 of which came within target's destruction radius. Of a total of 39 Category I missiles tested during the 16-month period ending 6 December 1960, 32 guided successfully and 31 of these were regarded as scoring hits.[44]

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44. Msg RDZSDG-30992-E, Dir Sys Mgt to ARDC, 28 Aug 1959 [Doc 406 in Hist of ADC, Jul-Dec 1960]; Msg RDZSDG-31129-E, Dir Sys Mgt to ARDC, 1 Oct 1959 [Doc 407 in Hist of ADC, Jul-Dec 1960]; Msg RDZSDG-31167-E, Dir Sys Mgt to ARDC, 19 Oct 1959 [Doc 408 in Hist of ADC, Jul-Dec 1960];

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In certain respects, ARDC Category II tests, which began in May 1960 and were conducted concurrently with Category I tests at Holloman Air Force Missile Development Center, achieved results similar to those of Category I. The first three Category II GAR-11's test-launched 25 May, 14 June and 22 June scored hits. The first Category II failure occurred 22 June when a test missile lost guidance after three seconds of flight and missed by 200 feet. By 29 August 1960, when Category II tests ended, 20 test missiles had been fired. Seventeen of these achieved

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[Cont'd] Msg RDZSDG-31325-E, Dir Sys Mgt to ARDC, 3 Dec 1959 [Doc 409 in Hist of ADC, Jul-Dec 1960]; Msg RDZSDG-30286-E, WADD to ARDC, 11 Mar 1960 [Doc 410 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG 30471-E, WADD to ARDC, 22 Apr 1960 [Doc 411 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-30515-E, WADD to ARDC, 6 May 1960 [Doc 412 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-30560-E, WADD to ARDC, 17 May 1960 [Doc 413 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-30601, WADD to ARDC, 27 May 1960 [Doc 414 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-30751-E, WADD to ARDC, 30 Jun 1960 [Doc 415 in Hist of ADC, Jul-Dec 1960]; Msg WWADG 9-8-535, WADD to ARDC, 12 Aug 1960 [Doc 416 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-4-18-8-586, WADD to ARDC, 18 Aug 1960 [Doc 417 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG-3-18-8-587, WADD to ARDC, 19 Aug 1960]; Msg WWZDGA-3-11-528, WADD to ARDC, 4 Nov 1960 [Doc 419 in Hist of ADC, Jul-Dec 1960]; Msg MCLDC-1789, ADC (MCLDC) to ADC, 6 Sep 1960 [Doc 420 in Hist of ADC, Jul-Dec 1960]; Msg WWZDGA-8-12-526, WADD to ARDC, 9 Dec 1960 [Doc 421 in Hist of ADC, Jul-Dec 1960]; ADC, ADLPG-I, Weekly Act Rept, 11 May 1960 [HRF].

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guidance and 16 scored hits. At least seven of the 16 successful Category II missiles were estimated to have come within ten feet of the target.[45]

The fact that 80 per cent of all GAR-11's launched during Categories I and II had guided with lethal range of the target did not mean that all GAR-11 components had

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45. Msg MDTFN 4-6-E, AFMDC to ADC, 16 Apr 1960 [Doc 422 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 4-16-E, AFMDC to ADC, 26 Apr 1960 [Doc 423 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 4-19-E, AFMDC to ADC, 2 May 1960 [Doc 424 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN-5-4-E, AFMDC to ADC, 10 May 1960 [Doc 425 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 5-12-E, AFMDC to ADC, 23 May 1960 [Doc 426 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 5-16-E, AFMDC to ADC, 27 May 1960 [Doc 427 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 6-3-E, AFMDC to ADC, 6 Jun 1960 [Doc 428 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 6-8-E, AFMDC to ADC, 11 Jun 1960 [Doc 429 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 6-14-E, AFMDC to ADC, 17 Jun 1960 [Doc 430 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 6-18-E, AFMDC to ADC, 21 Jun 1960 [Doc 431 in Hist of ADC, Jul-Dec 1960]; Msg MWEFN 2-23-E, AFMDC to ADC, 24 Jun 1960 [Doc 432 in Hist of ADC, Jul-Dec 1960]; Msg MDTBF 6-26-E, AFMDC to WADD, 1 Jul 1960 [Doc 433 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 7-2-E, AFMDC to ADC, 6 Jul 1960 [Doc 434 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 20-7-14-E, AFMDC to ADC, 22 Jul 1960 [Doc 435 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 28-7-21, AFMDC to ADC, 2 Aug 1960 [Doc 436 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 4-8-4, AFMDC to ADC, 4 Aug 1960 [Doc 437 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 10-8-11, AFMDC to ADC, 16 Aug 1960 [Doc 438 in Hist of ADC, Jul-Dec 1960]; Msg MDTFE 18-8-17, AFMDC to ADC, 18 Aug 1960 [Doc 439 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 25-8-25, AFMDC to ADC, 26 Aug 1960 [Doc 440 in Hist of ADC, Jul-Dec 1960]; Msg MDTFN 1-9-1, AFMDC to ADC, 3 Sep 1960 [Doc 441 in Hist of ADC, Jul-Dec 1960]; Msg WWZDGA 3-11-528, WADD to ARDC, 4 Nov 1960 [Doc 419 in Hist of ADC, Jul-Dec 1960]; ADC, ADLPG-I, Weekly Act Repts, 25 May, 28 Jul 1960 [HRF].

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functioned smoothly. Despite the fact that a fairly high amount of reliability was demonstrated, there were 21 proximity fuze malfunctions reported out of 36 firing as of the first week of September 1960. No fuze impulse at all was generated in two high-altitude (49,000 feet) shots, while the fuze was activated either early or late in the other 19 instances. These latter 19 failures were ascribed to random and spurious fuze pulses caused by over-sensitivity of the fuze, inability of the fuze to distinguish target returns from other radiation, and random radiation within the GAR-11 missiles themselves. The proximity fuze employed in Category I and II tests, a transistorized version of an earlier vaccum tube type, was susceptible to inadvertent triggering by pulses on the power supply line and the power output line. As a result of this proximity fuze trouble, the live-firing portion of the ADC Category III tests, originally scheduled for Tyndall between 6 September and 30 October 1960, were suspended in order to allow sufficient time for development of an adequate proximity fuze. Non-firing portions of the Category III tests were conducted between July and October 1960.[46]

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46. Msg ADOOP-T 2461, ADC to USAF, 1 Sep 1960 [Doc 442 in Hist of ADC, Jul-Dec 1960]; Msg MCLDC-1789, ADC

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Work on such a fuze commenced in early September 1960. By late October Hughes was becoming confident that the spurious fuze pulsing problem had been solved. Two fuzes, a "C" and a "D" model, were devised, the first to serve as an interim fuze until the second became available in June 1961. The "C" model was a fuze essentially isolated from the induced energies of the GAR-11. The "D" model incorporated "C" model improvements plus other circuits to increase reliability and improve countermeasures capabilities. By early December 1960, firing tests of both fuzes had commenced. By the end of January 1961, eight GAR-11's equipped with the new proximity fuzes were fired but the results were mixed. Five of the eight missiles were launched at high-altitude targets (50,000 to 60,000 feet), and the fuzes functioned as desired. The other three, aimed at low-altitude targets (3,000 to 5,000 feet), ended with unsuccessful fuzing.

[Cont'd] (MCLDC) to ADC, 6 Sep 1960 [Doc 420 in Hist of ADC, Jul-Dec 1960]; SECRET/NOFORN EX CANADA, Msg ADOOP-T 2559, ADC to USAF, 15 Sep 1960 [Doc 443 in Hist of ADC, Jul-Dec 1960]; Msg ADOOP-T 2584, ADC to USAF, 16 Sep 1960 [Doc 444 in Hist of ADC, Jul-Dec 1960]; Msg ADMME-DB 2781, ADC to 28 AD, 10 Oct 1960 [Doc 445 in Hist of ADC, Jul-Dec 1960]; Msg WWZDGA-9-11-535, WADD to ADC, 11 Nov 1960 [Doc 344 in Hist of ADC, Jul-Dec 1960]; ADC, ADLPG-I, Weekly Act Repts, 16 Sep and 7 Oct 1960 [HRF]; 73 AD Category III Test F-102/MG-10/GAR-11, Phases I, II and III [HRF].

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Random fuze pulses were detected in two of the three low-altitude shots. The "D" model fuzes went into production later in 1961.[46]

Even if the proximity fuze problem had not caused a delay of some six to eight months, operational GAR-11's would have been delayed this length of time from another cause. Delivery of nuclear warheads for GAR-11 missiles, scheduled to be furnished by the Atomic Energy Commission (AEC) in October 1960, was delayed till late 1961. Accidents, involving high explosives, at the Los Alamos Scientific Laboratory, necessitated changes in production facilities and safety procedures which halted production of certain components needed in development tests of the nuclear warhead. First it was believed that warheads for the GAR-11

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46. Msg WWZDG 1-9-528, WADD to ADC, 1 Sep 1960 [Doc 446 in Hist of ADC, Jul-Dec 1960]; Msg SWVSE 29-9-49, AFSWC to WADD, 30 Sep 1960 [Doc 447 in Hist of ADC, Jul-Dec 1960]; Msg WWZDG 19-10-526, WADD to ARDC, 19 Oct 1960 [Doc 448 in Hist of ADC, Jul-Dec 1960]; Msg WWZDGA 9-11-535, WADD to ADC, 11 Nov 1960 [Doc 344 in Hist of ADC, Jul-Dec 1960]; Msg LMDC 443, AMCASC to AFPR Hughes, 26 Oct 1960 [Doc 449 in Hist of ADC, Jul-Dec 1960]; Msg AFOOP-DE 67100, USAF to USAFE, 6 Dec 1960 [Doc 345 in Hist of ADC, Jul-Dec 1960]; Msg WWZDGA-1-2-526, WADD to ARDC, 2 Feb 1961 [Doc 550 in Hist of ADC, Jan-Jun 1961]; Msg WWZDGA 8-12-526M, WADD to ARDC, 9 Dec 1960 [Doc 421 in Hist of ADC, Jul-Dec 1960]; Msg LMDC 497, AMC to USAF, 20 Dec 1960 [Doc 346 in Hist of ADC, Jul-Dec 1960]; ADC, ADLPG-I, Weekly Act Rept, 7 Oct 1960 [HRF]; Msg ADMME-DB 1907, ADC to AFLC, 11 Sep 1961 [DOC 111].

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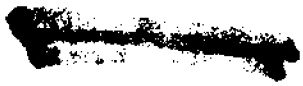

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could be made available in February 1961. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

The firing phase portion of the GAR-11 Category III tests (conducted by ADC at Tyndall) had been purposely delayed, first (as noted above) until another proximity fuze was fabricated, and second, until the AEC's reconfigured warhead underwent its operational suitability test. After the latter was accomplished in December 1961, other things combined to push back the live-firing phase of the Category III testing period, including shortages of adequate target drones, test missiles and testing time on the Eglin Gulf Range. Finally, Category III live-firing tests were held from May to July 1962. Twenty-five GAR-11 missiles, lacking atomic warheads, were launched against QF-80 and QB-47 drone targets at altitudes ranging

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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from 2,000 to 35,000 feet. Of 20 missiles providing valid guidance tests, 19 coming within an average distance of 29.8 feet of the target were successful, with 74 feet being the farthest and two direct hits, the closest. Only one failure also resulted from evaluations of the Safety and Arming Unit (incorporated in the GAR-11 as a nuclear safety device to prevent warhead detonation before the missile had been spirited a safe distance from the F-102A launching it). But the FM-CW radar proximity fuze supposed to trigger a signal to the warhead when within approximately 185 feet of the target, despite the reworking it had undergone by Hughes, failed about half the time.

Meanwhile, GAR-11's equipped with warheads had been released for tactical use with the F-102A fleet, beginning in 1961, because of ADC's need to increase its arsenal of atomic weapons. With the prospect that only half of them, if launched against hostile targets, might detonate because of defective fuzing mechanisms, ADC hastened tests of specially modified fuzes in early 1963 in hopes that a retro-fit program could get under way in late 1963 for replacing unreliable fuzes with good ones.[48]

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48. 73 AD, Final Rpt Category III F-102/MG-10/GAR-11 Phase IV tests, 21 Sep 1962 [HRF]; Msg ADOOP-P 1874, ADC to

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While the Hughes GAR-11 was a shorter and less powerful air-to-air weapon than the MB-1, its nuclear destructive capability was by no means small. Containing a semi-active radar homing mechanism, the GAR-11 could lock on and pursue its target once automatically launched by the F-102A/MG-10 fire control system, making it a rocket to reckon with during any air defense battle. It weighed about 250 pounds, measured 85 inches long by 11.4 inches in diameter at its widest point. The Thiokol solid propellant rocket motor that powered the GAR-11 provided 12,900 pound-seconds of thrust, enabling the GAR-11 to reach altitudes up to 60,000 feet and travel several miles distance.

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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[Cont'd] 73 AD, et al, 16 Jul 1962 [DOC 112]; Msg ADOOP-P 1935, ADC to ASD, 19 Jul 1962 [DOC 113]; Msg ADMME-DB 1029, ADC to SAAMA, 4 Apr 1963 [DOC 114]; Msg ADOOP-WT 1737, ADC to USAFE, 3 May 1963 [DOC 115]; FORMERLY RESTRICTED DATA, Msg ADMME-D 2021, ADC to Dir Spec Wpns, 3 Jun 1963 [DOC 116]; FORMERLY RESTRICTED DATA, Msg ADMME-DB 2601, ADC to Dir Spec Wpns, 3 Jul 1963 [DOC 117]; ADC Munitions Bulletin, No. 63-3, 15 Mar 1963, p. 5 [DOC 118]; Hist of ADC, Jan-Jun 1961, pp. 205-07; ADC Historical Study No. 14, op. cit., pp. 298-300.

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954) Because of the accuracy of the missile and explosive power of its warhead, the GAR-11 probability of kill was rated at 90 per cent. The warhead was a self-contained, sealed unit "one-point" safe measuring 10.7 inches in diameter, 15 inches in length, and about 50 pounds in weight.

Certain facilities for the GAR-11 were not unlike those employed for the MB-1. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954) For ground handling and loading operations, the GAR-11 was carried on a modified MF-9 trailer -- the same as used with the MB-1 but adapted to GAR-11 needs.

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(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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During checkout functions, the GAR-11 was subjected to a number of tests on a missile checkout console, including those of the angle tracking, range tracking, steering, internal power, fuzing and relock components. In 1961, a controversy arose over GAR-11 console checkout procedures. The Air Force Special Weapons Center (AFSWC) contended that the MK-54 warhead should be detached from each GAR-11 before the missile underwent console checkout -- contrary to prescribed methods allowing the marriage of warhead to missile during checkout. AFSWC argued that until a complete interlock modification embracing all console circuitry could be fabricated and incorporated in the console, separation of warhead from missile was essential during the checkout phase to prevent unwanted and potentially dangerous console electrical charges from reaching the warhead. An interlock console modification would serve as a positive check against this possibility, because it would require disconnecting the arming and fuzing cable from the warhead connector before console power could be admitted to any portion of the GAR-11. The Aeronautical Systems Division (ASD) reviewed this matter from a technical standpoint and tentatively deduced that a major and costly modification was in the offing if this interlock system was required.

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Furthermore, ASD estimated that GAR-11 checkout time would be doubled (from 15 to 30 minutes) if the warhead was removed, then reinstalled, for the checkout process. ASD, nevertheless, agreed that warhead separation was desirable during checkout until a foolproof solution was devised.[50]

ADC was quick to contest this viewpoint, reminding ASD that the existing console protected the warhead so long as proper checkout procedures were followed and the warhead arming and fuzing unit was disconnected before any current was applied to the missile. ADC complained, moreover, that doubling the checkout time to 30 minutes would mean that only half of the needed quantity of GAR-11's could be processed for use, unless the number of technicians assigned to each squadron was increased. Besides, detaching the GAR-11 warhead for each console check would raise another nuclear safety problem -- that of excessive handling of atomic ordnance -- since the frequency of warhead handling would increase considerably. Despite ADC's arguments, Middletown Air Materiel Area (MAAMA), on 31 August 1961,

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50. ADCR 52-14, "Technical Training GAR-11 "Technical Training GAR-11 Maintenance, Stroage and Loading," 1 May 1961 [HRF]; RESTRICTED DATA, Msg ADLSW 28-7-3, ADC Rep, AFSWC (Kirtland) to ADC, 31 Jul 1961 [Doc 595 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Msg AFSWC 2-7-02, ASD to AFSC, 3 Aug 1961 [Doc 596 in Hist of ADC, Jul-Dec 1961].

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ordered F-102A/GAR-11 squadron to remove warheads for GAR-11 checkouts until a console modification was effected. The order, however, was applicable only a brief time. The Nuclear Weapons Systems Safety Group met two weeks later and declared that the GAR-11 could safely undergo console testing with warhead attached, providing that established procedures were followed. MAAMA's order, therefore, was rescinded. GAR-11 technicians were cautioned to follow procedures that would make sure the warhead cable was the first cable connected to the test console and the last cable removed.[51]

Safety rules similar to those approved earlier for MB-1 carrying interceptors were authorized at mid-1961 for the F-102A/GAR-11 combination. Following the inadvertent release of a missile by an F-101B during the summer of 1961,

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51. RESTRICTED DATA, Msg ADCSA-M 1700, ADC to ASD, 14 Aug 1961 [Doc 597 in Hist of ADC, Jul-Dec 1961]; Msg MANBS-8, MAAMA to 5040 Consol Acft Maint Sq, 31 Aug 1961 [Doc 598 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Msg AFIDF-A-3-09-03-E, Dep IG for Safety, USAF to ADC, 6 Sep 1961 [Doc 599 in Hist of ADC, Jul-Dec 1961]; RESTRICTED DATA, Msg AFIDF-A-3-09-8-E, Dep IG for Safety, USAF to ADC, 14 Sep 1961 [Doc 600 in Hist of ADC, Jul-Dec 1961]; Msg ASZDGW 20-9-4, ASD to MAAMA, 21 Sep 1961 [Doc 601 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-DB 2020 Black Bear 117, ADC to Air Divs, 21 Sep 1961 [Doc 602 in Hist of ADC, Jul-Dec 1961]; Msg MANBS 1070, MAAMA to ADC, 25 Sep 1961 [Doc 603 in Hist of ADC, Jul-Dec 1961].

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ADC re-evaluated the operating procedures pertaining to the F-101B/F-106A/MB-1 and F-102A/GAR-11 systems, and subsequently reaffirmed their validity.

In at least one respect, however, the F-102A/GAR-11 rules, by early 1963, were one step ahead of the MB-1 rules. The F-102A was privileged to ferry the tactical GAR-11 (with rocket motor igniter disconnected to preclude an inadvertent launch) if directed by CINCNORAD/CINCONAD. This was the same right ADC was seeking at this time for the MB-1 systems. The mass-loading, turnaround, alert commitment and dispersal requirements were practically the same as those for the F-101B/F-106A/MB-1 systems.[52]

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52. RESTRICTED DATA, Msg ADOOP-WM 2718, ADC to USAF, 6 Dec 1961 [DOC 123]; ADCM 136-1, op. cit., 1 Nov 1962 [HRF]; ADCR 55-9, op. cit., 1 May 1962 [DOC 75]; ADCR 55-32, op. cit., 9 May 1962 [DOC 81]; RESTRICTED DATA, Msg AFIIS 83928, USAF to AFINS (Kirtland), 7 Jul 1961 [Doc 592 in Hist of ADC, Jul-Dec 1961]; Hist of ADC, Jan-Jun 1961, pp. 127-29; Msg ADCSA-M 1854, ADC to Dep IG for Safety, USAF (Norton), 1 Sep 1961 [Doc 593 in Hist of ADC, Jul-Dec 1961]; Msg ADCSA-W 2015, ADC to Dep IG for Safety, USAF 21 Sep 1961 [Doc 594 in Hist of ADC, Jul-Dec 1961]; Msg ADCSA-M 1847, ADC to Dir Nuclear Safety Research (Kirtland), 1 Sep 1961 [DOC 124]; Msg AFINS-1-9-18-61-E, Dir Nuclear Safety Research to ADC, 7 Sep 1961 [DOC 125]; Msg ADCSA-W 2081, ADC to AFSWC, 27 Sep 1961 [DOC 126]; Msg SWVCT 12-9-11, AFSWC to ADC, 13 Sep 1961 [DOC 127]; BLACK BEAR 63-25, Msg ADOOP-WM 947, ADC to Air Divs, 28 Mar 1963 [DOC 128]; FORMERLY RESTRICTED DATA, Msg ADMME-EB 991, ADC to 28 AD, 2 Apr 1963 [DOC 129]; Msg ADOOP 1597, ADC to Air Divs, 19 Apr 1963 [DOC 130]; Msg ADOOP-WM BLACK BEAR 63-25, 1835, ADC to Air Divs, 14 May 1963 [DOC 131].

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Tactics were carefully ironed out by the 4750th Test Squadron at Tyndall to assure that the F-102A approach to target would be most suited for launching, and exploiting the GAR-11 to best advantage. Unless the target possessed a decided speed or altitude advantage, a front quarter attack at an angle 135 degrees from the target's tail was favored. Also an escape maneuver was worked out to permit F-102A aircrews to turn to avoid the atomic contamination resulting from the GAR-11 detonation.[53]

GAR-9 AIR-TO-AIR ATOMIC GUIDED MISSILES (HUGHES)

The GAR-9 was unique in that it was orphaned before it was born. At least in 1959, years before a GAR-9 prototype was ready, plans were dropped to build the F-108 interceptor originally intended as the GAR-9's mother aircraft. Development of the GAR-9 was continued, together with the advanced ASG-18 fire control system designed to launch it, in hopes that a suitable high-speed interceptor capable of

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53. Hist of ADC, Jul-Dec 1960, pp. 180-81; Hist of ADC, Jul-Dec 1961, p. 276; ADCM 55-5, 1 Jan 1963 [HRF]; 73 AD Final Report Category III F-102/MG-10/GAR-11 Phase IV Tests, 21 Sep 1962 [HRF]; Msg ADOOP-WT 1737, ADC to USAFE, 3 May 1963 [DOC 115].

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using them, perhaps of the Improved Manned Interceptor class, would be authorized sometime in the future. Beginning in July 1956, ADC formulated specifications and characteristics, from which Hughes, by 1961, constructed a prototype model.

The GAR-9 contained a semi-active radar guidance component designed to lock on a target up to 43 nautical miles away (100 nautical miles on certain targets employing electronic jamming) and flying up to 100,000 feet high. The missile measured 150.5 inches long by 13.5 inches in diameter, and weighed 800 pounds. It was powered by an Aerojet-General solid-propellant rocket motor weighing 325 pounds and measuring 58.6 inches long by 12 inches in diameter. (b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

(b)(3):42 USC § 2162 (Atomic An alternate HE warhead would also be available for use.

In August 1961, the first GAR-9 missile was launched on the ground. By January 1962, three unguided missile firings had been accomplished to verify the GAR-9 launching envelope. On 15 January, a GAR-9 launched from the ground came within 55 feet of its QF-80 drone target flying at 13,500 feet above. Four months later, on 25 May 1962, the

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first GAR-9 air-to-air launching was tested from a B-58 flying at 36,000 feet, resulting in a six-foot near miss of its QF-80 drone target flying 15 nautical miles from the B-58. Striking even closer was the next air-to-air guided launch from a B-58 on 17 August 1962, during which the QF-80 drone target was grazed.[54]

While nothing short of complete success seemed to attend the 1962 GAR-9 test firings, a sharp turn of direction occurred in early 1963. On 21 February 1963, a GAR-9 was launched, again from a B-58, but this time at a supersonic Regulus II target. Failure ensued; the rocket motor failed to ignite and the GAR-9 plunged into the water. Within about a month's time, another GAR-9 was test fired against a Regulus II, resulting this time in the Hughes missile disintegrating in flight, whereupon an investigation was started to ferret out the reasons for its break up. Also, methods to increase availability of the B-58 test bed, which had been denied the test team an inordinate number of times

(b)(3):42 USC § 2162 (Atomic Energy Act of 1954)

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because of repeated groundings and numerous maintenance difficulties and repairs, were under investigation at this time. By July 1963, certain modifications had been applied to the B-58 enabling it to make supersonic test flights with the ASG-18/GAR-9 advanced weapon system. More changes were in the offing for the B-58 test bed, besides.[55]

AIR NATIONAL GUARD

Beginning in late 1959, F-89J's released by ADC's regular interceptor squadrons (in exchange for Century series aircraft) began pouring into ANG interceptor squadrons assigned an M-day commitment with ADC. Originally, 12 ANG squadrons were earmarked for F-89J's; but a change to the ADC/ANG program, which was in a fluid state between 1960 and 1961, reduced the number to eight squadrons equipped with the F-89J and, by 1961, assigned to ADC. A ninth F-89J squadron was added in 1962. Meanwhile, ANG units authorized the F-102A, raised from four to six squadrons in 1960, received their "Delta Darts" in early 1961.* And beginning

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55. RESTRICTED DATA, USAF, Current Status Report, March 1963, pp. 3-16, 3-17 [HRF]; ADC, ADLPW-A, Weekly Act Rept, 8 Apr 1963 [HRF]; RESTRICTED DATA, USAF, Current Status Report, Jul 1963, p. 3-23 [HRF].

* The six ADC/ANG F-102A squadrons were: 182nd

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on 1 July 1961, the operational ADC/ANG interceptor force, except for a few squadrons, began placing two interceptors per squadron on five-minute, around-the-clock alerts analogous to those performed by ADC's regular interceptor force.

Since mid-1960, ADC had supported a proposal to equip the ADC/ANG F-89J squadrons with MB-1 nuclear rockets. ADC figured that 50 MB-1's assigned each F-89J augmentation unit, while stored and maintained under the custody of ADC technicians, would strengthen the Command's hand for dealing with massed bomber attacks. Moreover, both in October 1960 and January 1961, ADC expressed a desire to arm the six ADC/ANG F-102A squadrons with GAR-11's. To complicate matters, there was a sizeable funding problem involved. Only three F-89J squadrons were situated on USAF bases where nuclear storage facilities were available -- the 116th FIS at Spokane, the 179th FIS at Duluth, and 132nd FIS at Dow -- meaning that the others would require having small-sized storage facilities constructed for them at an estimated cost of $500,000 per base. Aside from construction costs, a contingent of ADC personnel would have to be assigned to guarantee

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[Cont'd] (Kelly AFB, Tex); 111th (Ellington AFB, Tex); 122nd (New Orleans NAS, La); 159th (Imeson Aprt, Fla); 175th (Joe Foss Fld, Sioux Falls, SD); and 146th (Greater Pittsburgh Aprt, Pa).

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continuance of federal custody and control of allocated MB-1's as required by law. Despite these cost and staffing obstacles, the JCS and Department of Defense, as well as USAF, approved (by mid-1961) the arming of ADC/ANG F-89J squadrons with the MB-1. Construction of MB-1 facilities was accordingly approved the same year at five non-collocated ANG F-89J units: the 123rd FIS (Portland IAP, Ore), 134th FIS (Burlington MAP, Vt), 176th FIS (Truax Fld, Wisc), 178th FIS (Hector Aprt, Fargo, ND), and 186th FIS (Great Falls MAP, Mont). The 124th FIS (Des Moines, Iowa), which exchanged F-86L's for F-89J's in 1962, was subsequently accorded authorization for an MB-1 facility, too, making six in all. In September 1961, the JCS and DOD approved ADC's proposal to modify the six ADC/ANG F-102A squadrons for carrying GAR-11. Calendar year 1964 was later forecast as the time period for accomplishment.[56]

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56. Hist of ADC, Jan-Jun 1959, pp. 190-91; Hist of ADC, Jan-Jun 1960, pp. 100-02; Hist of ADC, Jul-Dec 1960, pp. 173-74; Hist of ADC, Jul-Dec 1961, pp. 198-200; Msg ADMME-DE 2311, ADC to Air Divs, 17 Aug 1960 [Doc 437 in Hist of ADC, Jan-Jun 1961]; FORMERLY RESTRICTED DATA, Msg ADMME-DE 2585, ADC to USAF, 16 Sep 1960 [Doc 438 in Hist of ADC, Jan-Jun 1961]; Msg ADMME-DE 2840, ADC to OOAMA, 13 Oct 1960 [Doc 439 in Hist of ADC, Jan-Jun 1961]; FORMERLY RESTRICTED DATA, Msg ADODC 3090, ADC to 30 AD, 10 Nov 1960 [Doc 440 in Hist of ADC, Jan-Jun 1961]; Msg ADCCR 100, ADC to USAF, 17 Jan 1961 [Doc 366 in Hist of ADC, Jul-Dec 1960]; Msg ADCMO-G 720, ADC to USAF, 6 Apr 1961 [Doc 441 in Hist of ADC, Jan-

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Over a year elapsed between the time F-89J squadrons were authorized tactical MB-1's and when any actually employed them for alert duty. Meantime, the lines of custodial responsibility, embracing the storage, servicing, maintenance, loading and guarding of MB-1's, were clarified and carefully spelled out in early 1962 so that Federal control over them would be sustained inviolate. ADC received DOD permission to employ ANG air technicians to help guard nuclear-loaded F-89J's, thereby alleviating a burdensome manpower drain that otherwise would have been levied on the Command's limited resources. Arrangements were also made to transmit applicable BLACK BEAR nuclear activities messages to F-89J guard units. F-89J/MB-1 support plans were drawn up; interrelationships were ironed out; manpower tables were established; and other essential details resolved. Then in late 1962, the three F-89J squadrons having on-base access to MB-1 storage, maintenance and servicing facilities (because they were

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[Cont'd] Jun 1961]; Msg ADMME-DE, ADC to NGB, 19 May 1961 [Doc 442 in Hist of ADC, Jan-Jun 1961]; Msg AFOOP 78221, USAF to CINCONAD, 14 Jun 1961 [Doc 443 in Hist of ADC, Jan-Jun 1961]; NORAD Historical Summary, Jan-Jun 1961, pp. 55-56; RESTRICTED DATA, USAF, Current Status Reports, Jan 1961, pp. 3-34, Mar 1961, p. 3-33, May 1961, p. 3-31, Jun 1961, p. 3-33, and Jul 1961, p. 3-33 [HRF]; RESTRICTED DATA, Msg ADLSP 2695, ADC to 26 AD, et. al., 8 Oct 1962 [DOC 135]; Msg ADOOP-WM 0051, ADC to 30 AD, 20 Oct 1959 [DOC 136].

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collocated with regular ADC squadrons possessing these facilities) -- the 132nd (Dow), 179th (Duluth) and 116th (Spokane) -- assumed an alert posture calling for two F-89J's armed with MB-1's on 15-minute alert status. All the restrictions pertaining to the MB-1 in combination with the F-89J, itemized in safety rules governing ground alert and airborne (during DEFCON 1 or Air Defense Emergency) situations, were made to apply to the ANG squadrons.[57]

Five of the six non-collocated F-89J squadrons, according to early schedules, were due to assume comparable alert postures armed with "Genies" in 1963, since MB-1 facilities for them were programmed for completion by December 1962. But lagging construction work caused postponements in anticipated completion dates,. first to mid-1963,

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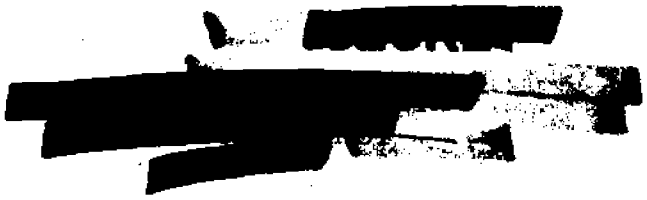
57. ADCM 27-2, Vol II, Chg G, 3 Dec 1962 [HRF]; RESTRICTED DATA, ADC to ADC Staff Agencies, "USAF Current Status Report - January 1961," 19 Feb 1962 [HRF]; Msg AFOOP 98594, USAF to ADC, 5 Feb 1962 [DOC 137]; Msg ADOOP-WM 397, ADC to USAF, 9 Feb 1962 [DOC 138]; Msg ADMME-DE 385, ADC to USAF, 8 Feb 1962 [DOC 139]; Msg ADOOP-WM 654, ADC to Air Divs, 7 Mar 1962 [DOC 140]; Msg ADOOP-WM 666, ADC to Air Divs, 8 Mar 1962 [DOC 141]; Msg ADOOP-WM 1686, ADC to CINCNORAD, 20 Jun 1962 [DOC 142]; Msg ADCIG-S 370, ADC to USAF, 7 Feb 1962 [DOC 143]; RESTRICTED DATA, Msg ADCCS 625, ADC to USAF, 5 Mar 1962 [DOC 144]; BLACK BEAR Msg 172, ADCIG-S-I 1082, ADC to Air Divs, et. al., 19 Apr 1962 [DOC 145]; Msg ADCMO-E 1226, ADC to USAF, 4 May 1962 [DOC 146]; ADCR 11-5, "Administrative Practices 'BLACK BEAR'," 5 Nov 1962 [DOC 147]; Interview with L/Col J.A. Patalive, 9 May 1963; Msg ADCIG-S 971, ADC to AFLC, 29 Mar 1963 [DOC 148].



then to December 1963. It seemed likely that 1964 would arrive before they commenced standing atomically-armed alerts. Necessary ADC/ANG relationships, meantime, were perfected to insure that the integrity of federal custody and control of allocated MB-1's would continue intact at these non-collocated bases. The F-89J squadron at Des Moines (added in 1962), while programmed to acquire its MB-1 facility during FY 1964, would not actually see it readied for use before the spring of 1965, according to forecasts. Although construction delays were thus preventing non-collocated F-89J squadrons from assuming nuclear alerts, the half dozen squadrons involved were not denied access to MB-1's during an emergency. A limited number of "Genies" were kept in store for them at ADC storage facilities on bases within range of the non-collocated F-89J units, so that interceptors from them, in case of attack, would fly to these bases to obtain their MB-1's.

As regards the six ADC/ANG F-102A squadrons, the period for interceptor GAR-11 modifications remained firm (as of mid-1963) for 1964. During the first half of 1963, another two ADC/ANG squadrons -- the 157th FIS (McEntire AFB, SC) and the 151st FIS (McGhee Tyson Aprt, Tenn) -- traded their F-104's for F-102A's. Presumably these two would

also be converted, possibly in 1964 along with the other six, in which case a total of eight ADC/ANG F-102A squadrons would be issued GAR-11's.[58]

NUCLEAR SAFETY INSPECTIONS

To check the methods by which nuclear weapons were handled, loaded, stored and protected at interceptor and BOMARC squadrons, USAF and ADC inspection teams regularly conducted Initial Capability Inspections, Capability Inspections, and Nuclear Weapon Spot Checks. The Initial Capability Inspection was held 30 or more days before the squadron was scheduled to receive nuclear ordnance.

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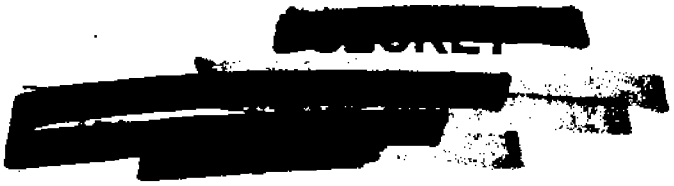
58. FORMERLY RESTRICTED DATA, ADC to ADC Staff Agencies, "USAF Current Status Report - May 1962," 21 Jun 1962, p. 2 [HRF]; FORMERLY RESTRICTED DATA, Msg ADCES 437, ADC to Air Divs, 8 Feb 1963 [DOC 149]; FORMERLY RESTRICTED DATA, Msg ADOOP-WM 408, ADC to 30 AD, 6 Feb 1963 [DOC 150]; Msg ADMME-EB 482, ADC to SAAMA, 13 Feb 1963 [DOC 151]; FORMERLY RESTRICTED DATA, Msg ADMME-EB 748, ADC to Det 1, CHADS, 12 Mar 1963 [DOC 152]; Msg ADMME-D 860, ADC to NGB, 21 Mar 1963 [DOC 153]; Msg ADCMO 1033, ADC to USAF, 5 Apr 1963 [DOC 154]; RESTRICTED DATA, Msg 30-CIG 05005, 30 AD to ADC, 21 May 1963 [DOC 155]; NOFORN/RESTRICTED DATA, Msg ADCCS 2100, ADC to USAF, 11 Jun 1963 [DOC 156]; Msg ADMDC 2903, ADC to CINCONAD, 8 Aug 1963 [DOC 42]; Msg ADPDP-L 2968, ADC to NGB, 14 Aug 1963 [DOC 157]; Msg ADOOP-WM 2995, ADC to USAF, 21 Aug 1963 [DOC 158]; Msg ADMME-EB 5094, ADC to Air Divs, 25 Sep 1963 [DOC 159]; Msg ADOOP 5251, ADC to USAF, 10 Oct 1963 [DOC 160].



Capability Inspections, which accounted for the majority of the inspections performed, were conducted within 90 days after the unit obtained nuclear weapons, and thereafter at intervals not exceeding 18 months. If possible, the Capability Inspection was performed in conjunction with an Operational Readiness Inspection (ORI). Nuclear weapon Spot Checks, on the other hand, were performed on any unit at any time. For the most part, the inspections, and particularly the Capability Inspections, covered the following nuclear weapon activities: security system (including the intrusion alarm network as well as implementation of the "buddy system"); weapons storage, maintenance, and assembly; warhead mating, testing, handling, and loading. Other phases of the inspection covered ground transportation of weapons, base logistical and administrative support, and weapon training programs. While in most instances, the inspections resulted in satisfactory ratings, they served to uncover defects and reveal shortcomings which, if left uncorrected, might lead to serious consequences. Units adjudged unsatisfactory were relieved of their combat-ready status until again proved proficient with nuclear weapons within 90 days after failing an inspection.[59]

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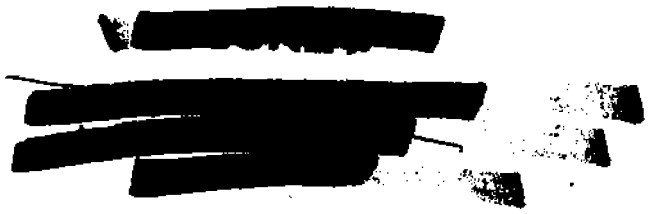
59. ADCM 127-2, "Missile/Nuclear Safety Criteria,"

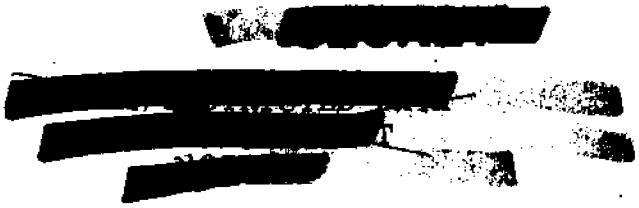


Although USAF singled out nuclear safety as a special subject for inspection in late 1959, months elapsed before qualified teams could be organized at USAF and ADC to bring this about. In the meantime, units earmarked to possess nuclear weapons received advance inspections for testing their capability to operate and maintain them. And certain activities peculiar to operational nuclear-armed units, such as exercises simulating "Broken Arrow" nuclear accidents, and tests of nuclear mass-loadings and turnarounds (generally involving inert training versions of the MB-1) were covered as an integral part of the unit ORI.* Security systems of MB-1 storage compounds were checked and DECUF (Defense Capability Under Fallout) plans were observed as part of the customary ORI. By mid-1960, individual tests of the nuclear activities of units were well under way.[60]

[Cont'd] 1 Aug 1962 [DOC 161]; Msg ADMME-EB 2619, ADC to USAF, 28 Sep 1962 [DOC 162]; AFR 123-9, 31 Aug 1960 [Doc 620 in Hist of ADC, Jul-Dec 1961]; AFR 123-6, 16 Nov 1961 [Doc 621 in Hist of ADC, Jul-Dec 1961]; ADCR 122-2, "Missile/Nuclear Safety Criteria," 8 May 1961 [Doc 622 in Hist of ADC, Jul-Dec 1961].

* After mid-1962, mass-loading tests were conducted with live nuclear rockets.

60. RESTRICTED DATA, ADC, Tactical Evaluation/ORI of 25 AD, 10 Nov 1959, pp. 1A-2A, D1-D6, 2F-8F [Doc 399 in Hist of ADC, Jan-Jun 1960]; RESTRICTED DATA, ADC, Tactical Evaluation ORI of 28 AD, 25 Jan 1960 [Doc 402 in Hist of ADC, Jan-



During late 1960, nearly half of ADC's interceptor squadrons were inspected to ascertain their competence in matters related to nuclear armament. As part of an ORI of the 26th Air Division in July 1960, for example, the 98th FIS (Dover) submitted to an armament capability test. While four other interceptor squadrons of the 26th were adjudged satisfactory, the 98th FIS was stripped of its combat operational readiness status because of violations detected in MB-1 procedures and safety rules. For one thing, one of the rockets had been accepted and was loaded in an F-101B without a motor safety pin installed. Moreover, supervisors and loading personnel were not properly qualified and certified; and supervisors were not employing prescribed check lists during the critical armament loading function.

Shortly afterward, the USAF team found that the 445th FIS (Wurtsmith) "could not satisfactorily accomplish assigned nuclear weapon responsibilities," chiefly owing to unsatisfactory weapons loading procedures resulting from use of unauthorized, locally developed check lists. In contrast, the 15th FIS (Davis-Monthan) -- the next squadron to undergo

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[Cont'd] Jun 1960]; RESTRICTED DATA, ADC, Tactical Evaluation ORI of 28 AD, 11 Apr 1960 [Doc 405 in Hist of ADC, Jan-Jun 1960]; RESTRICTED DATA, ADC, ORI of 29 AD, 6 May 1960 [Doc 406 in Hist of ADC, Jan-Jun 1960]; Hist of WADF, Jan-Jun 1958, pp. 82-83; Hist of WADF, Jul-Dec 1958, pp. 89-90.

a capability inspection -- although failing to pass an ORI, was passed by the ADC inspection team on that part of the ORI dealing with nuclear weapons and nuclear safety. Again three months later, when it underwent (and incidentally passed) a second ORI, the 15th FIS was still considered satisfactory with respect to its nuclear weapons activities.[61]

Meantime, the 98th FIS was re-inspected by a USAF team in August, and again fell short. This time two F-101B's standing a five-minute alert were discovered not to have their master armament switch guards "safetied" and sealed, as required; two other F-101B's standing a one-hour alert, each loaded with two tactical MB-1's and two GAR-2's, did not have the switch guards and restraints on their armament selector switch properly "safetied" and sealed. Moreover, the team learned that rescinded check lists were being employed, despite the fact that revised check lists had been made available.[62]

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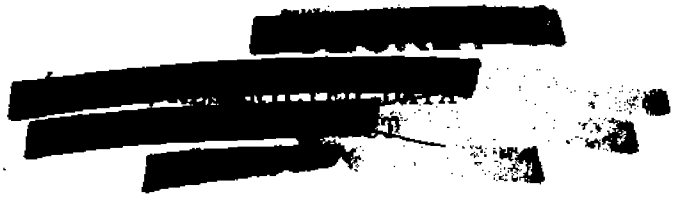
61. Field Memo Rpt, 26 AD ORI, 11-22 Jul 1960 [Doc 246 in Hist of ADC, Jul-Dec 1960]; Msg AFCRM 07-8, USAF Dep IG for Inspection to USAF, 21 Jul 1960 [Doc 247 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-ORI 6-60, ADCIG-ORI Team to USAF, 6 Aug 1960 [Doc 248 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG 14-60, ADCIG ORI Team to USAF, 23 Nov 1960 [Doc 249 in Hist of ADC, Jul-Dec 1960].

62. Msg AFCRM Y-74, USAF Dep IG for Inspection to USAF, 27 Aug 1960 [Doc 250 in Hist of ADC, Jul-Dec 1960].



When informed of the results, General Atkinson found "such utter disregard for the requirement of safety, operational capability and military discipline...intolerable." Immediately afterward, the 98th FIS was drastically reorganized, especially as regards maintenance of nuclear weapons, and the 26th Air Division formed an inspection and assistance team to visit its fighter squadrons, including the 98th FIS, every quarter.[63]

Then the 29th FIS (Malmstrom), during a capability inspection conducted by an ADC team, was not only rated unsatisfactory on the nuclear weapons aspect of an ORI, but was also stigmatized by an MB-1 accident in the course of its ORI. Weaknesses were detected in the squadron's MB-1 training program as well as in the testing, inspection and loading phases of its MB-1 activities.[64]

By the end of September 1960, ADC was convinced that drastic action was required to halt carelessness in the

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63. Msg ADCCR 2476, ADC to 26 AD, 6 Sep 1960 [Doc 251 in Hist of ADC, Jul-Dec 1960]; Msg ADCSA-M 2447, ADC to Air Divs, 1 Sep 1960 [Doc 252 in Hist of ADC, Jul-Dec 1960]; Msg 26CCR 0547-S, 26 AD to ADC, 9 Sep 1960 [Doc 253 in Hist of ADC, Jul-Dec 1960].

64. Msg ADCIG-I 004429, ADC to USAF, 21 Sep 1960 [Doc 254 in Hist of ADC, Jul-Dec 1960].

handling of nuclear weapons. Division commanders were told on 30 September:[65]

> This matter is of the gravest concern to the Commander and, in fact, is considered by him to be the most critical and important single problem within the Air Defense Command at this time....General Atkinson's policy has been and remains that deficiencies in nuclear safety are simply unacceptable...He desires that responsible commanders at every echelon give daily personal attention to the status of each of his nuclear equipped units and take action as required to insure compliance with established standards of safety, reliability and reaction time.

It did not take long for the 29th FIS to improve its MB-1 program. By the end of October, acceptable procedures had been adopted. Personnel and equipment were brought more quickly and safely to the MB-1 loading area, technicians were schooled to attain standardization and follow safety criteria, supervision was substantially bettered, and the MB-1 training program was revamped. Teams from ADC, the 28th Air Division, USAF, and ATC visited the 29th FIS to provide special assistance in various categories of its MB-1 program. Then, in November, the 29th FIS was subjected to another capability inspection by ADC and was given a rating of satisfactory as regards nuclear weapons. The 29th FIS

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65. Msg ADCCS 2691, ADC to All Air Divs, 30 Sep 1960 [Doc 254 in Hist of ADC, Jul-Dec 1960].

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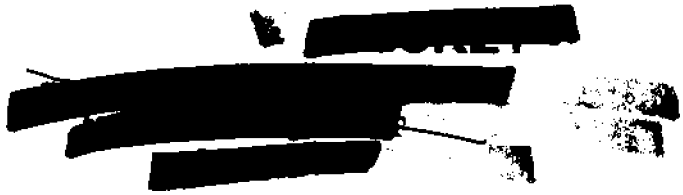

again demonstrated its competence in all facets of nuclear weapons activities in January 1961.[66]

From the time ADC brought into sharp focus for division commanders the gravity of the nuclear weapons problem, the trend swung in the opposite direction. The preponderence of squadrons inspected for the rest of the year earned satisfactory ratings in this category. As noted above, the 29th FIS, upon re-inspection, proved satisfactory. The 445th FIS also underwent re-inspection and was awarded a satisfactory rating. Soon the 62nd, 84th, 322nd, 49th, and 27th squadrons followed suit by gaining satisfactory ratings of their own and subsequently strengthening weaker portions of their programs disclosed in the inspection reports. Two other units, however, did not pass inspection. The 325th Fighter Wing, servicing the 318th FIS (McChord), (1) lacked the

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66. Msg 29CIG 004888, 29 AD to ADC, 13 Oct 1960 [Doc 256 in Hist of ADC, Jul-Dec 1960]; Msg 29CIG 004889, 29 AD to ADC, 13 Oct 1960 [Doc 257 in Hist of ADC, Jul-Dec 1960]; Msg 29OOT 004909, 29 AD to ADC, 14 Oct 1960 [Doc 258 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 2941, ADC to USAF, 25 Oct 1960 [Doc 260 in Hist of ADC, Jul-Dec 1960]; Msg ADCCS 2967, ADC to USAF, 31 Oct 1960 [Doc 259 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 115-C, ADC to USAF, 10 Nov 1960 [Doc 261 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 3392, ADC to USAF, 21 Dec 1960 [Doc 262 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-ORI 1-61, ADCIG-ORI Team to ADC, 9 Jan 1960 [Doc 263 in Hist of ADC, Jul-Dec 1960].

Loading an MB-1 type rocket (lacking atomic warhead) on an F-106A.

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capability to mass-load F-106A's efficiently in one hour (the maximum time allowed at that time); (2) neglected to adhere to established technical orders; (3) employed insufficiently qualified loading crews; and (4) left something to be desired in nuclear weapons training and supervisory functions. An intensified training program was thereupon launched, and within six weeks qualified crews were on duty, technical orders were religiously followed and the other flaws were ironed out in preparation for a re-inspection sometime in February 1961. Interceptors of the 319th FIS (Bunker Hill), somewhat like those of the 98th FIS several months before, were discovered without guards on special weapon release lock switches and without armament selector switches properly "safetied" and sealed, while certain additional shortcomings were also unearthed in other portions of the squadron's armament program. Considerable effort then took place to put the 319th on a satisfactory footing. Certain personnel changes were effected, a full scale training program in all phases of missile/nuclear safety was tackled, a safety council was established, an accident/incident prevention program was inaugurated, and loading personnel were recertified. By the end of the year, the 319th FIS considered

itself sufficiently toned up to undergo another unannounced inspection anytime in 1961.[67]

The year 1961 proved a busy one as regards nuclear weapons inspections. Aside from inspections conducted at BOMARC missile bases, there were 30 capability inspections, four initial capability inspections and eight spot inspections. USAF inspection teams undertook eight of the inspections; ADC inspection teams performed 34 of them. The 42 inspections involved 31 units of the fighter force and included two fighter wings that supported two squadrons apiece. Thus 33 of the command's then 41 squadrons -- equal to 80 per cent of the fighter force -- were inspected. Two units were inspected three times, and seven units twice.

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67. Field Memo Rpt, 30 AD ORI, 12-21 Oct 1960, 21 Oct 1960 [Doc 264 in Hist of ADC, Jul-Dec 1960]; Msg AFCRM OS 244, USAF Dep IG for Insp to USAF, 2 Nov 1960 [Doc 265 in Hist of ADC, Jul-Dec 1960]; Msg AFCRM 5954, USAF Insp Team to ADC, 4 Nov 1960 [Doc 266 in Hist of ADC, Jul-Dec 1960]; Msg AFCRM ODC 11-6, USAF Dep IG to USAF, 17 Nov 1960 [Doc 267 in Hist of ADC, Jul-Dec 1960]; Msg 26CIG 040, 26 AD to ADC, 9 Dec 1960 [Doc 268 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 12-3, 12-4, ADC Insp Team to SAC, 8 Dec 1960 [Doc 269 in Hist of ADC, Jul-Dec 1960]; Msg 26CIG 045, 26 AD to ADC, 28 Dec 1960 [Doc 270 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 066, ADC to USAF, 11 Jan 1961 [Doc 271 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 00-4137, ADC Insp Team to USAF, 10 Nov 1960 [Doc 272 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 3393, ADC to USAF, 21 Dec 1960 [Doc 273 in Hist of ADC, Jul-Dec 1960]; Msg AFCRM 11-10, USAF Dep IG to USAF, 9 Nov 1960 [Doc 274 in Hist of ADC, Jul-Dec 1960]; Msg 30CIG-S-90-60, 30 AD to ADC, 11 Nov 1960 [Doc 275 in Hist of ADC, Jul-Dec 1960]; Msg ADSA-M 3140,

Not quite half the inspections took place during the first six months of the year. These started conspicuously well, with the first eleven of 20 inspections ending in satisfactory ratings. The three units inspected in January -- 343 Fighter Group (servicing the 11th FIS at Duluth), 78th Fighter Wing (servicing the 83rd and 84th squadrons at Hamilton), and 507th Fighter Group (servicing the 438th FIS at Kincheloe) -- earned satisfactory ratings unhindered by major flaws. Although discrepancies were unearthed in the security and maintenance areas of the 329th FIS (George) during the next ADC Capability Inspection (held from 30 January to 2 February 1961), this squadron performed well enough[68] to receive a satisfactory score.

[Cont'd] ADC to Air Divs, 16 Nov 1960 [Doc 276 in Hist of ADC, Jul-Dec 1960]; Msg ADCIG-I 3270, ADC to USAF, 5 Dec 1960 [Doc 277 in Hist of ADC, Jul-Dec 1960]; Msg 30CIG-S-128-60, 30 AD to ADC, 6 Dec 1960 [Doc 278 in Hist of ADC, Jul-Dec 1960].

68. FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-39-S, ADC (IG Insp Team) to USAF, 7 Jan 1961 [Doc 623 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg WGCAS S-05, ADC (IG Insp Team) to ADC, 7 Jan 1961 [Doc 624 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-S-1, ADC (IG Insp Team) to USAF, 12 Jan 1961 [Doc 625 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-1329-035, ADC (IG Insp Team) to ADC, 3 Feb 1961 [Doc 626 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 28CIG OS77, 28 AD to ADC, 18 Feb 1961 [Doc 627 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 501, ADC to USAF, 7 Mar 1961 [Doc 628 in Hist of ADC, Jul-Dec 1961].

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Soon afterward, the 319th FIS (Bunker Hill) and the 325th Fighter Wing (servicing the 318th FIS at McChord), both of which had obtained unsatisfactory ratings during inspections in late 1960, were subjected to ADC Capability Inspections. In both cases, the units achieved satisfactory evaluations unmarred by major defects. A similar result was attained by the 75th FIS (Dow) during a USAF Capability Inspection several days later. Although the three inspections that immediately followed at the 13th FIS (Glasgow), 87th FIS (Lockbourne) and 456th FIS (Castle), conducted between 20 February and 9 March, culminated in satisfactory ratings, various shortcomings were observed. The 13th FIS, for example, fell short in its security equipment; while both the 456th and 87th squadrons were considered undermanned at their MB-1 storage sites. The 84th Fighter Group (servicing the 498th FIS at Spokane), on the other hand, passed its inspection blemishfree later that same month (13-16 March).[69]

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69. Hist of ADC, Jul-Dec 1960, pp. 197-98; FORMERLY RESTRICTED DATA, Msg ADCIG-1-2-11, ADC (IG Insp Team) to USAF, 9 Feb 1961 [Doc 629 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 02253, ADC (IG Insp Team) to USAF, 10 Feb 1961 [Doc 630 in Hist of ADC, Jul-Dec 1961]; Msg AFIRI-A-3-2-45, USAF (IG Insp Team) to USAF, 22 Feb 1961 [Doc 631 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 13 MAEO23C, ADC (IG Insp Team) to USAF,

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Despite the limitations in nuclear weapons activities discovered at some units, as mentioned above, it was not until the first week of April, when the 60th FIS (Otis) underwent an ADC capability inspection, that a squadron was stigmatized with an unsatisfactory grade. Several glaring deficiencies were uncovered at the 60th, including violations in the security and maintenance departments. Furthermore a weapons maintenance team accepted an MB-1 suspected of being defective. The 60th FIS was instantly relieved of its status as an active nuclear-capable unit until it could demonstrate, upon re-inspection, competence enough for reinstatement, as it subsequently did. To be sure, the 60th FIS corrected practically every deficiency discovered in a matter of hours. Then from 5 to 6 May, during a reinspection of its nuclear weapons activities, the 60th

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[Cont'd] 24 Feb 1961 [Doc 632 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I-C 670, ADC to USAF, 30 Mar 1961 [Doc 633 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 87MA61-36, ADC (IG Insp Team) to USAF, 24 Feb 1961 [Doc 634 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I-C 682, ADC to USAF, 31 Mar 1961 [Doc 635 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 465CAS 61-625, ADC (IG Insp Team) to USAF, 9 Mar 1961 [Doc 636 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I-C 712, ADC to USAF, 5 Apr 1961 [Doc 637 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 33, ADC (IG Insp Team) to USAF, 17 Mar 1961 [Doc 638 in Hist of ADC, Jul-Dec 1961].

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FIS performed satisfactorily, thereupon reverting to a nuclear capable status.[70]

Lt. General Lee, ADC Commander, observed about this time that:[71]

> In the past six months, we have made marked progress throughout this command in nuclear weapons safety and efficiency. For this I compliment all of you who have contributed. However, in recent weeks, inspections by the Inspector General and assistance visits by the Bear Cat Team have identified units which are not capable of handling their weapons with safety. This indicates to me a lack of complete and precise understanding of the rigid requirement for perfection in all nuclear weapons activity. I am, therefore....[re-emphasizing] this requirement to all commanders and...[bringing] it directly to the attention of every individual concerned.

All seven of the remaining inspections conducted to the mid-year turning point ended with satisfactory ratings. Although shortcomings were discovered at three of them -- the 95th FIS (Andrews), 456th FIS (Castle) and 87th FIS (Lockbourne),

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70. FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-281, ADC (IG Insp Team) to USAF, 6 Apr 1961 [Doc 639 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 26ODC 0193-S, 26 AD to NORAD, 8 Apr 1961 [Doc 640 in Hist of ADC, Jul-Dec 1961]; Msg 551MME-Q, 551 AEW&C Wg to MOAMA, 8 Apr 1961 [Doc 641 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 26CIG 023, 26 AD to ADC, 24 Apr 1961 [Doc 642 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 984, ADC to USAF, 9 May 1961 [Doc 643 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-368, ADC (IG Insp Team) to USAF, 6 May 1961 [Doc 644 in Hist of ADC, Jul-Dec 1961].

71. "Black Bear" Msg 65, Lt Gen Lee to all members of ADC concerned with nuclear weapons, n.d. (ca. May 1961 [DOC 95].

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the latter two of which had experienced one inspection earlier in the year (as noted above) -- they were not serious enough to prevent satisfactory scores. Host base support provided by Headquarters Command for the 95th FIS (Andrews AFB), for example, left something to be desired, while the 87th FIS (Lockbourne) lacked its allotment of skilled technicians in the nuclear weapons field, particularly at supervisory levels, as a consequence of which the squadron's nuclear weapons training program lagged behind ADC's standards, and its weapons mass-loading capability suffered. After stepping up the frequency of its mass-loading training exercises to compensate in some measure for this personnel shortage, the 87th FIS (in August) was subjected to, and successfully passed without reservation, a third inspection of its nuclear weapons activities. Meanwhile, up to mid-year, the 78th Fighter Wing (servicing the 83rd and 84th Squadrons at Hamilton) passed its second inspection on 11 April; and the 414th Fighter Group (servicing the 437th FIS at Oxnard), 1st Fighter Wing (servicing the 71st and 94th Squadrons at Selfridge), 49th FIS (Griffiss), and as described above, the 60th FIS (Otis) passed inspections during April and May. Hence, the 20 inspections carried out during the first part of the year were subdivided into 12 satisfactory ratings,

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seven satisfactory ratings limited by shortcomings, and one unsatisfactory rating.[72]

Practically this same success-failure ratio repeated itself during the second half of the year. Between 17 and 20 July, the 48th FIS (Langley) successfully passed an initial capability inspection, qualifying thereby to receive nuclear weapons. Later the same month, the 52nd Fighter

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72. FORMERLY RESTRICTED DATA, Msg ADCIG-I 3070, ADC (IG Insp Team) to USAF, 7 Apr 1961 [Doc 645 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 017, ADC (IG Insp Team) to USAF, 13 Apr 1961 [Doc 646 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 1039, ADC to USAF, 17 May 1961 [Doc 648 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg FCCG-I 61-445, ADC (IG Insp Team) to USAF, 13 Apr 1961 [Doc 647 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I-61S-192, ADC (IG Insp Team) to USAF, 21 Apr 1961 [Doc 649 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 61-446, ADC (IG Insp Team) to AMC, 13 Apr 1961 [Doc 650 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I C-6188, ADC (IG Insp Team) to USAF, 28 Apr 1961 [Doc 651 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 22-E, ADC (IG Insp Team) to USAF, 19 May 1961 [Doc 652 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 87-CAS-61-367, ADC (IG Insp Team) to 30 AD, 5 Jun 1961 [Doc 653 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 30-CIG-S-216-61, 30 AD to ADC, 26 Jun 1961 [Doc 654 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 1417, ADC to USAF, 7 Jul 1961 [Doc 655 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA/NOFORN, Msg 30-CCR-S-309-61, 30 AD to ADC, 7 Aug 1961 [Doc 656 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 587, ADC (IG Insp Team) to USAF, 25 Aug 1961 [Doc 657 in Hist of ADC, Jul-Dec 1961].

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Group (servicing the 2nd FIS at Suffolk) and 98th FIS (Dover) were subjected to, and passed, capability inspections performed by the command, but a number of insufficiencies of a lesser nature were turned up at both units. The three capability inspections performed in August on the 478th Fighter Wing (servicing the 18th FIS at Grand Forks), 32nd Fighter Wing (servicing the 5th FIS at Minot) and as noted above, the 87th FIS (Lockbourne) all culminated in satisfactory ratings.[73]

But the first one conducted in September on the 15th FIS (Davis-Monthan) uncovered a number of faults with that squadron's nuclear weapon loading activities, resulting in the second and last unsatisfactory rating given during the

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73. FORMERLY RESTRICTED DATA, Msg ADCIG-I 1218, ADC (IG Insp Team) to USAF, 20 Jul 1961 [Doc 658 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-IS-601, ADC (IG Insp Team) to USAF, 28 Jul 1961 [Doc 659 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 1861, ADC to USAF, 5 Sep 1961 [Doc 660 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 26OOP-WF 0578-S, 26 AD to ADC, 20 Oct 1961 [Doc 661 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-IXY 45, ADC (IG Insp Team) to USAF, 3 Aug 1961 [Doc 662 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADPTR-TM 1654, ADC to 26 AD, 7 Aug 1961 [Doc 663 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG 1889, ADC to USAF, 8 Sep 1961 [Doc 664 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-18-18-4, ADC (IG Insp Team) to USAF, 18 Aug 1961 [Doc 665 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 8-27, ADC (IG Insp Team) to USAF, 23 Aug 1961 [Doc 666 in Hist of ADC, Jul-Dec 1961].

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year. The inspection team found that unreliable stray voltage checks had been accepted as valid, that certain steps prescribed by weapon-loading ADC check lists were sometimes omitted or performed out of sequence, and that loading crew members displayed below average proficiency. Management and supervision of the weapon loading function was declared substandard, and standardization was found lacking in the weapon-loading training program. The squadron embarked on a program to correct its defects; training activities were improved, check lists were religiously followed, and supervisory personnel underwent rigorous schooling. Within a month's time the 15th was sufficiently toned up to undergo another inspection. It satisfactorily passed a re-inspection on 12 October.[74]

The remaining fifteen inspections ended in ratings of satisfactory, or of satisfactory with some room for improvement. An initial capability inspection from 6 to 7 September at the

74. Msg ADCIG-161-90, ADC (IG Insp Team) to USAF, 8 Sep 1961 [Doc 667 in Hist of ADC, Jul-Dec 1971]; Msg 28MME-D 1C411, 28 AD to ADC, 4 Oct 1961 [Doc 668 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 28CIGIS 415, 28 AD to ADC, 6 Oct 1961 [Doc 669 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-1 61-105, ADC (IG Insp Team) to USAF, 13 Oct 1961 [Doc 670 in Hist of ADC, Jul-Dec 1961].

[redacted]

57th Fighter Group (64th FIS at Paine) showed that that unit was prepared to receive nuclear weapons. Aside from improvements needed in security, manning and other designated areas, the 325th Fighter Wing (servicing the 318th FIS at McChord), 444th FIS (Charleston) and 84th Fighter Group (servicing the 498th FIS at Spokane), where nuclear weapons spot inspections were conducted by USAF in September, demonstrated competence enough to earn satisfactory ratings. For two of them -- the 325th Fighter Wing and the 84th Fighter Group -- these inspections amounted to their second for the year. The 445th FIS (Wurtsmith) and 56th Fighter Wing (servicing the 62nd FIS at K.I. Sawyer) passed capability inspections later the same month, although the 56th Fighter Wing was found improveable in its security category.[75]

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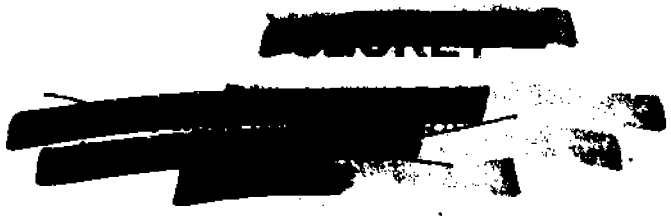
75. Msg ADCIG-I 61-09-07, ADC (IG Insp Team) to USAF, 8 Sep 1961 [Doc 671 in Hist of ADC, Jul-Dec 1961]; Msg ADCIG-I 2849, ADC to USAF, 19 Dec 1961 [Doc 672 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg AFIWI-C-09 421, USAF Dep IG for Insp to USAF, 8 Sep 1961 [Doc 673 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 2256, ADC to USAF, 14 Oct 1961 [HRF]; FORMERLY RESTRICTED DATA, Msg 26CYG 039, 26 AD to ADC, 22 Sep 1961 [Doc 674 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg 26CIG 043, 26 AD to ADC, 13 Oct 1961 [Doc 675 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 2365, ADC to USAF, 25 Oct 1961 [Doc 676 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg AFIWI-C 82, USAF Dep IG for Insp to ADC 22 Sep 1961 [Doc 677 in Hist of ADC, Jul-Dec 1961]; Msg AFIWI-09-16-E, USAF Dep IG for Insp to ADC, 25 Sep 1961 [Doc 678 in



As described above, the 15th FIS (Davis-Monthan), during its second inspection of the year 12 October, redeemed its previous rating of unsatisfactory. Earlier the same month, the 29th FIS (Malmstrom) had successfully passed an inspection, too; while later on, during November and early December, the 27th FIS (Loring), 48th FIS (Langley), 539th FIS (McGuire), and 76th FIS (McCoy) were awarded, upon inspection, satisfactory ratings. For the 48th FIS, this was the second inspection of the year. Later in December, three USAF Spot Inspections were performed at the 78th Fighter Wing (servicing the 83rd and 84th squadrons at Hamilton) -- its third inspection of the year; the 329th FIS (George) -- its second of the year; and the 408th Fighter Group (servicing the 322nd FIS at Kingsley). All three units won satisfactory ratings qualified by imperfections detected in their security system, which were subsequently rectified.

The overall figures for the latter half of 1961 tallied at 12 satisfactory ratings, nine satisfactory (but

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[Cont'd] in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 9-15, ADC (IG Insp Team) to USAF, 29 Sep 1961 [Doc 679 in Hist of ADC, Jul-Dec 1961]; Msg Uncl ADCIG-I-W 6209, ADC (IG Insp Team) to USAF, 20 Sep 1961 [from ADCIG files].

improveable) ratings, and one unsatisfactory rating. For the entire year, there existed only two unsatisfactory ratings out of 42 inspections (about five per cent). Compared with results of those performed during the second half of 1960, when six inspections out of about 14 (approximately 43 per cent) proved unsatisfactory, this reflected considerable progress.[76]

Again the preponderant amount of the regular interceptor force was subjected to rigorous inspections of nuclear functions during 1962. About 80 per cent of the interceptor force experienced at least one nuclear inspection by ADC, USAF or Defense Atomic Support Agency (DASA), with

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76. Hist of ADC, Jul-Dec 1960, pp. 193-98; Msg ADCIG-I 0249, ADC (IG Insp Team) to USAF, 6 Oct 1961 [from ADCIG files]; Msg NYMDC 61S-4927, NYADS to USAF, 18 Nov 1961[Doc 680 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 1535, ADC (IG Insp Team) to USAF, 5 Dec 1961 [Doc 681 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg AFIWI-C-1-2924, USAF Dep IG for Insp to USAF, 9 Dec 1961 [Doc 682 in Hist of ADC, Jul-Dec 1961]; Msg ADCIG-I-A 137, ADC to USAF Dep IG for Insp, 17 Jan 1962 [Doc 683 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 192, ADC to USAF, 23 Jan 1962 [Doc 684 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg AFIWA-C-2115, USAF Dep IG for Insp to USAF, 12 Dec 1961 [Doc 685 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 176, ADC to USAF, 23 Jan 1962 [Doc 686 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg AFIDI 6379, USAF Dep IG for Insp to USAF, 14 Dec 1961 [Doc 687 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Msg ADCCS 158, ADC to USAF, 22 Jan 1962 [Doc 688 in Hist of ADC, Jul-Dec 1961].

one unit receiving four inspections, seven receiving three inspections, 13 receiving two, and ten, one. Out of a total of 61 inspections (aside from those performed at field-level echelons), 37 were performed by ADC, 13 by DASA (called Technical Standardization Inspections), and 11 by USAF. In all but five cases, a satisfactory rating was earned. Nevertheless, certain factors were discovered that limited the nuclear armament performance of most of the units pronounced satisfactory which were soon corrected. Often, these were found in the security, ground communications, and alarm systems. Several units lacked nuclear weapons officers because of the acute shortage of personnel qualified in this speciality. Explosive ordnance disposal (EOD) operations were found wanting at some units, as well.[77]

The five units rated unsatisfactory were based at Grand Forks, Duluth, Suffolk County, Griffiss and Bunker Hill. Most of the imperfections of the 478th Fighter Wing (supporting the 18th FIS at Grand Forks), as turned up by inspectors in January, were in the physical security area. An alert hangar intrusion alarm system failed to work; ground

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77. Msg ADCIG-S 2110, ADC to Air Divs, 8 Aug 1962 [DOC 163]; FORMERLY RESTRICTED DATA, Msg 26CIG 019, 26 AD to ADC, 8 Aug 1962 [DOC 164].

communications, both primary and secondary, were less than satisfactory; snow was piled against the security fencing; and access to the alert hangar area was considered vulnerable to penetration. Within a day's time, however, practically all these defects were ameliorated, so that the unit passed a re-inspection, and thus was restored to a nuclear-armed alert status, just two days after failing. The 343rd Fighter Group (supporting the 11th FIS at Duluth), which was next to fail an inspection on February 23 and 24, lost out because among other faults: five uncertified maintenance technicians performed storage inspections on about 30 MB-1 weapons (a fault that alone was automatically cause for an unsatisfactory rating); weapons maintenance and historical records were incorrect; quality control of records was substandard; and test set electrical connectors used in MB-1 storage inspections were contaminated by foreign matter. These failings were promptly cleared up and the unit, upon passing a re-inspection three weeks later, resumed nuclear-armed alerts.

More than a month elapsed before the third unsatisfactory unit, the 52nd Fighter Group (servicing the 2nd FIS at Suffolk County), was recertified as competent to resume nuclear-armed alerts. The unit was adjudged unsatisfactory

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in early June for faulty procedures when breaking out MB-1's from storage, and delivering them for loading on F-101B's, besides certain glaring shortcomings in its physical security network. By the end of tne month most of the trouble was over: new procedures were adopted and the technicians drilled in their use, with approved check lists scrupulously followed; proficiency training was practiced by crews responsible for the breakout, transportation and loading of MB-1's; and the security force was schooled repetitively in areas needing improvement. Then, during a re-inspection of the 52nd Fighter Group 16 to 18 July, personnel connected with nuclear weapons and the nuclear safety program showed they could discharge their tasks to the letter of the rules and the satisfaction of the inspectors.

The last two unsatisfactory reports for the year, the 49th FIS (Griffiss) and 319th FIS (Bunker Hill), were inspected at mid-August and mid-September, respectively. Both squadrons were guilty of two violations in common: (1) poles supporting power transmission lines near armament storage areas were spaced so far apart that a power line, if broken, might drop on a building housing nuclear armament; and (2) sand bag barricades were not positioned in storage magazines as required by ADC in June of the year.

[redacted]

The 49th, moreover, wrongfully passed a defective firing mechanism timer unit during an inspection cycle, and committed lesser infractions, all of which were subsequently remedied, as satisfactorily demonstrated during a re-inspection of the squadron at the end of August. A sizeable list of faults in addition to the two named above were catalogued at the 319th during its September Capability Inspection. The faults included improper handling and maintenance of MB-1's with a result that warheads, firing mechanisms and nose cones had become scratched and gouged; management and supervision of certain nuclear weapons functions left something to be desired; weapons maintenance technicians were insufficiently trained; the quality control program was substandard; weapons maintenance check lists were not up to date; handling equipment was improperly maintained; and SOP's had not been revised, as required. As if this were not enough, discrepancies were noted on every nuclear weapon examined. By the time the squadron was re-inspected in late October, however, either these wrongs had been righted or they were in process of correction. Vigorous training programs, revision of check lists, SOP's and quality control records, management and supervisory improvements, repair and refurbishing of weapons and ground handling equipment --

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all reflected the energy expended in earning the satisfactory rating awarded the 319th upon re-inspection October 22 to 23.[78]

During the first half of 1963, the volume of inspections concerning nuclear activities, management and control at manned interceptor units, as compared with the volume during the same period one year before (January-June 1962), shrank to half the number. This was attributable in part to the USAF Inspector General's Office, which conducted only one Capability Inspection during the entire six months. The ADC office of the Inspector General was responsible for 13 Capability Inspections, which, together with four Technical Standardization Inspections performed by DASA, and the single USAF inspection, constituted 18 inspections in all. A satisfactory rating was earned all but once. While the units inspected (except one) passed during their first go-round for 1963, certain shortcomings were revealed by the inspectors at each, which limited the units performance. Sometimes

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78. FORMERLY RESTRICTED DATA/NOFORN, The documentation for this section, consisting of inspection reports and ensuing correspondence generated by the inspections, is contained in 94 inspection reports and follow-up messages numbered Documents 165 thru 258. Interview with L/Colonel R.E. Dent, Jr., 3 May 1961; ADC Munitions Bulletin, No. 63-3, 15 Mar 1963 [DOC 118].

[redacted]

these factors amounted to scratched tactical MB-1's, not deep or serious enough to warrant a "dull sword" report, but indicative that the unit, at some time, had mishandled the weapons involved. Often, the limiting factors were traceable to tardy base support. Four units, for example, while able to demonstrate competency in handling their nuclear weapons, lacked the sandbag barricades ADC had ordered positioned in the center cubicles of the storage magazines. And several units contained power-line poles that were spaced too far apart, so that a power line, if broken, conceivably might land on a munitions building housing atomic ordnance. Generally where the need existed for sandbag barricades and additional power-line poles, the base responsible for support had been notified months in advance of the inspection. Yet action had been unduly delayed or postponed by the support base, leaving the tactical unit shortchanged.

Whatever the cause for complaints voiced by the inspection teams, prompt attention was given them soon after the reports appeared. In most cases, they were either rectified or in course of being corrected within days. By giving impetus for removal of hazardous conditions and potentially dangerous situations, the various inspection teams

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helped circumvent what otherwise might result in a "bent spear" or "broken arrow" occurrence.

The single instance of an unsatisfactory rating occured at the 414th Fighter Group, which serviced the 437th FIS at Oxnard. From 25 January through 2 February 1963, during its third inspection within 14 months, the 414th demonstrated unacceptable performances in the fields of security and training. Aside from several lesser violations, the 414th was guilty of permitting armament technicians whose certification had lapsed to work on war reserve MB-1's -- an offence which in itself constituted grounds for an automatic grading of unsatisfactory. Within two weeks time, nevertheless, the 414th corrected enough of the discrepancies to pass a re-inspection held from 11 through 14 February.[79]

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79. FORMERLY RESTRICTED DATA/NOFORN, The documentation for this section, consisting of some fifty inspection reports and ensuing correspondence generated by the inspections, is contained in Documents 259 through 309 [DOC 118]; ADC Munitions Bulletin, No. 63-3, 15 Mar 1963, p. 4; Interview, ADCIG-M, on 12 Sep 1963.

[redacted]

1962 Inspections of Nuclear Activities at Manned Interceptor Squadrons

Unit	Base	Month	Result	Type Inspection
78 Ftr Wg (83 & 84 FIS)	Hamilton	Jan	S	ADC Capability
13 FIS	Glasgow	Jan	S	USAF Spot
414 Ftr Gp (437 FIS)	Oxnard	Jan	S	ADC Capability
329 FIS	George	Jan	S	ADC Capability
507 Ftr Wg (438 FIS)	Kincheloe	Jan	S	ADC Capability
482 FIS	Seymour-Johnson	Jan	S	ADC Initial Capability
478 Ftr Wg (18 FIS)	Grand Forks	Jan	U	USAF Spot
478 Ftr Wg (18 FIS)	Grand Forks	Jan	S	ADC Capability Re-Inspection
445 FIS	Wurtsmith	Feb	S	USAF Spot
319 FIS	Bunker Hill	Feb	S	DASA
414 Ftr Gp (437 FIS)	Oxnard	Feb	S	ADC Spot
87 FIS	Lockbourne	Feb	S	USAF Spot

Unit	Base
343 Ftr Gp (11 FIS)	Duluth
507 Ftr Wg (438 FIS)	Kincheloe
76 FIS	Westover
1st Ftr Wg (71 & 94 FIS)	Selfridge
331 FIS	Webb
48 FIS	Langley
343 Ftr Gp (11 FIS)	Duluth
343 Ftr Gp (11 FIS)	Duluth
84 Ftr Gp (498 FIS)	Spokane
56 Ftr Wg (62 FIS)	K.I. Sawyer
325 Ftr Wg (318 FIS)	McChord
57 Ftr Gp (64 FIS)	Paine
13 FIS	Glasgow

Month	Result	Type Inspection
Feb	U	ADC Capability
Mar	S	DASA
Mar	S	ADC Capability
Mar	S	DASA
Mar	S	ADC Initial Capability
Mar	S	USAF Spot
Mar	S	ADC Capability Re-Inspection
Mar	S	DASA
Mar	S	ADC Capability
Mar	S	DASA
Mar	S	ADC Capability
Mar	S	ADC Capability
Apr	S	ADC Capability

Unit	Base
87 FIS	Lockbourne
1st Ftr Wg (71 & 94 FIS)	Selfridge
507 Ftr Wg (438 FIS)	Kincheloe
328 Ftr Wg (326 FIS)	Richards-Gebaur
52 Ftr Gp (2 FIS)	Suffolk
84 Ftr Gp (498 FIS)	Spokane
98 FIS	Dover
539 FIS	McGuire
78 Ftr Wg (83 & 84 FIS)	Hamilton
84 Ftr Gp (498 FIS)	Spokane
325 Ftr Wg (318 FIS)	McChord
328 Ftr Wg (326 FIS)	Richards-Gebaur
82 FIS	Travis

Month	Result	Type Inspection
25 Apr-2 May	S	ADC Capability
25 Apr-2 May	S	ADC Capability
25 Apr-2 May	S	ADC Capability
May	S	ADC Initial Capability
Jun	U	ADC Capability
Jun	S	DASA
Jun	S	ADC Capability
Jun	S	ADC Capability
Jun	S	DASA
Jun	S	DASA
Jun	S	DASA
Jul	S	ADC Capability
Jul	S	ADC Capability

Unit	Base
52 Ftr Gp (2 FIS)	Suffolk
15 FIS	Davis-Monthan
329 FIS	George
482 FIS	Seymour Johnson
49 FIS	Griffiss
328 Ftr Wg (326 FIS)	Richards-Gebaur
49 FIS	Griffiss
48 FIS	Langley
95 FIS	Andrews
57 Ftr Gp (64 FIS)	Paine
444 FIS	Charleston
328 Ftr Wg (326 FIS)	Richards-Gebaur
319 FIS	Bunker Hill

Month	Result	Type Inspection
Jul	S	ADC Capability Re-Inspection
Jul	S	USAF Spot
30 Jul-3 Aug	S	USAF Spot
Aug	S	DASA
Aug	U	ADC Capability
Aug	S	USAF Spot
Aug	S	ADC Capability Re-Inspection
Sep	S	ADC Capability
Sep	S	ADC Capability
Sep	S	DASA
Sep	S	ADC Capability
Sep	S	DASA
Sep	U	ADC Capability

Unit	Base
56 Ftr Wg (62 FIS)	K. I. Sawyer
445 FIS	Wurtsmith
75 FIS	Dow
60 FIS	Otis
319 FIS	Bunker Hill
482 FIS	Seymour-Johnson
225 Ftr Wg (318 FIS)	McChord
98 FIS	Dover
29 FIS	Malmstrom
57 Ftr Gp (64 FIS)	Paine

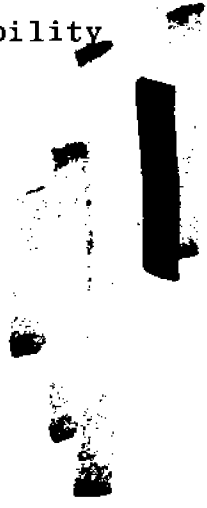
Month	Result	Type Inspection
Sep	S	ADC Capability
Sep	S	ADC Capability
Oct	S	ADC Capability
Oct	S	ADC Capability
Oct	S	ADC Capability Re-Inspection
Nov	S	ADC Capability
Nov	S	USAF Spot
Nov	S	DASA
Nov	S	USAF Spot
Dec	S	USAF Spot

January-June 1963 Inspections of Nuclear Activities at Manned Interceptor Squadrons

Unit	Base	Month	Result	Type Inspection
456 FIS	Castle	Jan	S	USAF Capability
414 Ftr Gp (437 FIS)	Oxnard	25 Jan-2 Feb	U	ADC Capability
329 FIS	George	25 Jan-2 Feb	S	ADC Capability
15 FIS	Davis-Monthan	25 Jan-2 Feb	S	ADC Capability
5 FIS	Minot	Feb	S	ADC Capability
414 Ftr Gp (437 FIS)	Oxnard	Feb	S	ADC Capability
408 Ftr Gp (322 FIS)	Kingsley	Feb	S	ADC Capability
78 Ftr Wg (83 & 84 FIS)	Hamilton	Feb	S	ADC Capability
27 FIS	Loring	Mar	S	ADC Capability
75 FIS	Dow	Mar	S	ADC Capability
60 FIS	Otis	Mar	S	ADC Capability

Unit	Base
444 FIS	Charleston
29 FIS	Malmstrom
29 FIS	Malmstrom
328 Ftr Wg (326 FIS)	Richards-Gebaur
95 FIS	Andrews
13 FIS	Glasgow

Month	Result	Type Inspection
Apr	S	DASA
Apr	S	DASA
May	S	ADC Capability
May	S	ADC Capability
May	S	DASA
Jun	S	ADC Capability



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INCIDENTS AND ACCIDENTS

No matter how carefully safety rules and check lists were composed and disseminated, how assiduously inspection teams checked tactical units, and how thoroughly nuclear weapon teams were trained in the art of working with nuclear weapons, the command was sure to suffer nuclear mishaps. Although the accident rate objective never ceased being zero per cent, ADC personnel handled hundreds of weapons, both nuclear and non-nuclear, every day, and alert aircraft by the score were subjected to the nuclear weapon loading and unloading process. As noted above, 90,000 movements involving live and inert versions of the MB-1 and 3,000 involving tactical and training versions of the GAR-11 were reported for calendar year 1962 alone. The opportunity for error was great and the Law of Chance had never been repealed. But despite the growing increase in nuclear weapons from 1959 to mid-1963, while the F-101B/F-106/MB-1 and F-102A/GAR-11 systems entered the inventory of air defense weapons, the number of accidents/incidents concerning ADC's air-to-air atomic ordnance gradually declined, especially after 1960, testifying to the effectiveness of the nuclear operating, training, inspection and safety programs.

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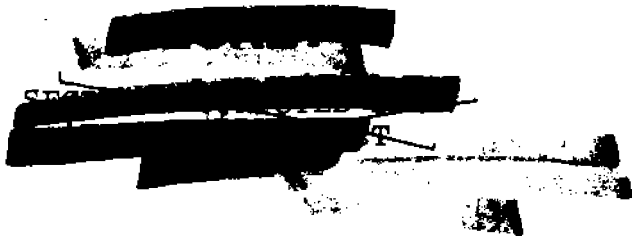

At no time was a nuclear warhead, or the HE element of a nuclear air-to-air rocket, accidentally detonated.

Few nuclear mishaps occurred in 1959 besides those involving the F-89J/MB-1 (see pages 34 and 35), because the F-101B and F-106A were just being phased into the command. Nevertheless, on 23 and 24 August 1959, two inert training models of the MB-1 were inadvertently released, one on each day, by the same F-101B. Faulty wiring in the F-101B's MG-13 fire control system was the cause. The gravity of the episode was evident aside from the loss of trainer rockets costing thousands of dollars. Had tactical MB-1's been aboard in their place, they would probably have been released instead.[80]

The total number of 1960 nuclear episodes was comparatively high. The F-101B/F-106A -- MB-1 systems were new; recently formed armament crews, while academically trained, lacked the practical skills that only experience could foster, and thus were more apt to make mistakes. The

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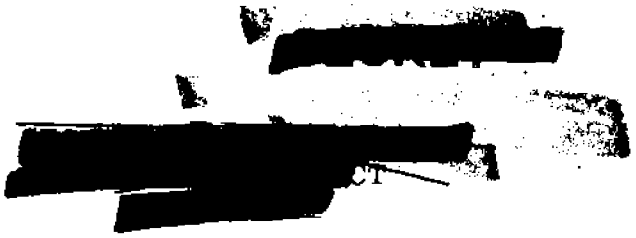
80. Hist of ADC, Jan-Jun 1959, pp. 225-28; Hist of ADC, Jul-Dec 1959, pp. 133-34; ADC, Ofc Ch of Safety, Project 10A Accident/Incident List for 1959, 8 Dec 1960 [DOC 48].



factor of cramped working conditions during the armament loading and unloading processes involving century series aircraft, as noted before, was in part instrumental for personnel errors that occurred.

The first incident was caused not by personnel error, however, but by materiel failure. The front hooks by which the MB-1 (or its inert training version) was suspended to F-101B Bohanan carrier racks gave way on an F-101B at the 78th Fighter Wing (Hamilton) shortly after the turn of the year. While a trainer rocket consequently fell, it was caught between the armament door and fuselage, preventing it from dropping completely out the aircraft. Similar incidents occurred on 23 and 31 May while the F-101B's affected were on the ground. What damage ensued to the MB-1's involved was not serious enough to detonate the high explosive components. Rockwell hardness tests conducted on F-101B suspension hooks showed that many of them failed to meet original specifications, for which replacements were ordered. However, this was not the end to armament materiel problems for the F-101B. Mishaps involving the

F-101B ejector rack mechanism dogged ADC during later years as well.[81]

Other 1960 nuclear episodes caused by mechanical defects or materiel failures included (1) the accidental firing of an MB-1 initiator pin when a cable employed in the downloading process became fouled; (2) a warhead that fell about two feet (but luckily stopped approximately 18 inches above the ground) at Bunker Hill on 10 May, when the safety stand holding it tipped and a worn quick release safety pin slipped from its position in the H-16 beam, allowing the hoist holding the warhead to drop; and (3), slippage of a dummy MB-1LT during a practice loading when a clevis pin broke. In none of these instances, nor for that matter, in any of those described below, did a detonation of the warhead or the HE occur. Toward the end of the year, a malfunctioning F-101B ejector rack was responsible for an inert MB-1 training round striking the aircraft after being fired at a target.[82]

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81. ADC, ADLPG-I, Weekly Act Rept, 25 Jan 1960 [HRF]; ADC, Ofc Ch of Safety, Project 10B Accident/Incident List for 1960, 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-CB 182, ADC to 78 Ftr Gp, 13 Jan 1960 [Doc 228 in Hist of ADC, Jan-Jun 1960]; Msg ADMME-CB 127, 14 Jan 1960 [DOC 310]; Msg ADMME-CB 173, ADC to F-101 WSPO, 20 Jan 1960 [Doc 230 in Hist of ADC, Jan-Jun 1960].

82. ADC, Ofc Ch of Safety, Project 10B Accident/

[redacted]

[redacted]

Nuclear episodes attributable to personnel errors were in considerable number. In most of the cases, loading crew members, generally because they failed to obey check lists, were guilty of igniting initiators of MB-1 tactical or training rockets, but fortunately without ensuing damage to the rocket. This occurred at least six different times, once in April, two or three times in June, at least once in August and twice in October. Other personnel errors resulted in (1) an MB-1 LT falling to the ground in June at Wurtsmith, probably because the driver towing several of the rockets stopped his towing vehicle too suddenly, causing the MB-1LT to roll off its MF-9 trailer; (2) a dented MB-1 rocket motor shell the same month, when the loading crew accidentally struck it with a rocket housing handle; (3) cracked fins of an MB-1 in August due to improper handling operations; (4) damaged fins of an MB-1 in September at Malmstrom because of the loading crew's failure to secure the aft lug to the F-101B launch rack; and (5) inadvertant

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[Cont'd] Incident List for 1960, 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-CA 199, ADC to Air Divs, 21 Jan 1960 [Doc 231 in Hist of ADC, Jan-Jun 1960]; Msg 30MME-CA C-1451-60, 30 AD to 319 FIS, 18 May 1960 [Doc 235 in Hist of ADC, Jan-Jun 1960]; Msg SWVCT-23-12-18, AFSWC to OOAMA, 23 Dec 1960 [DOC 311].

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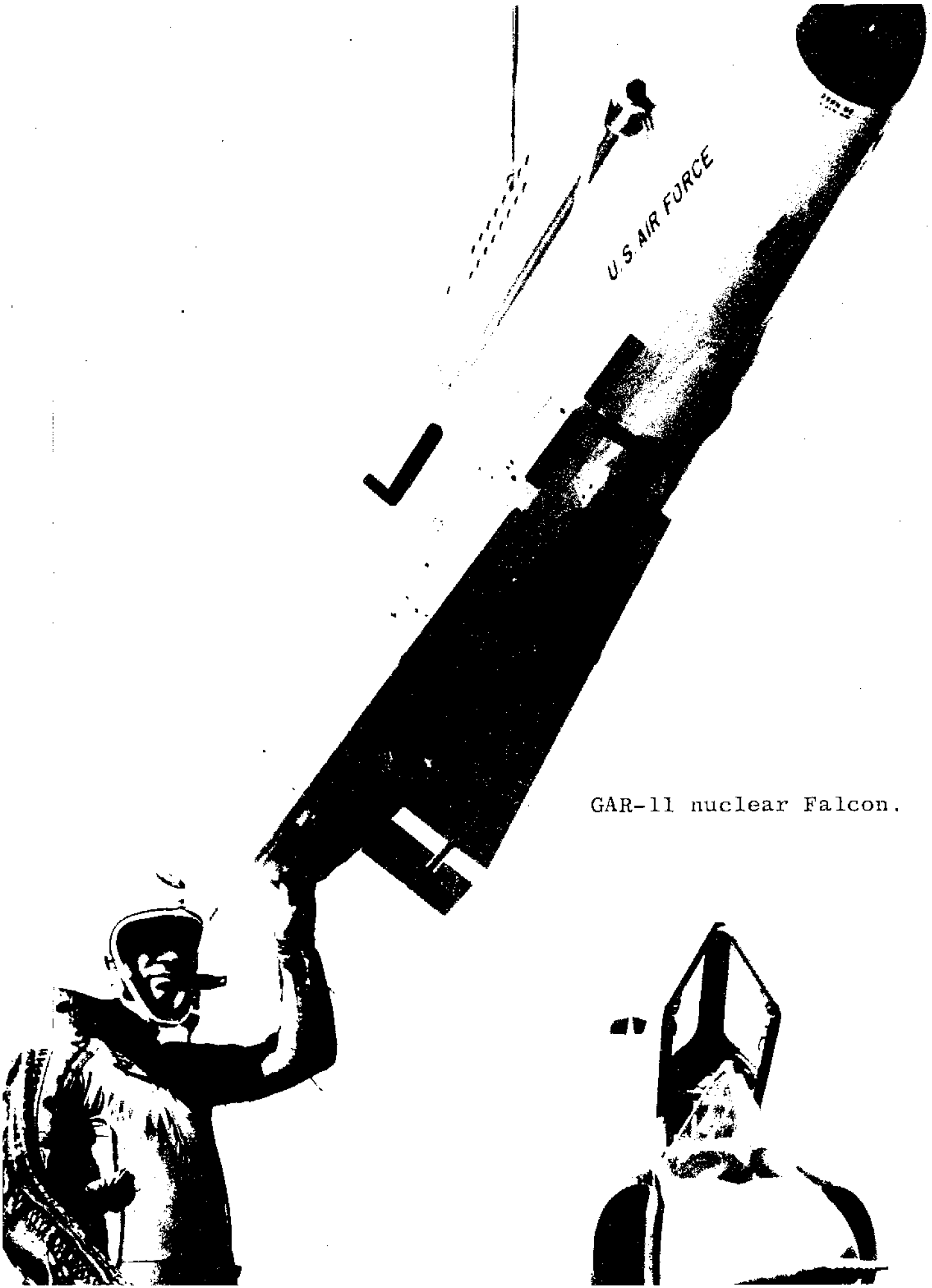

GAR-11 nuclear Falcon.

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jettison of an MB-1LT in November because a certain aircraft relay had been substituted without authorization.[83]

Accidents and incidents in connection with air-to-air nuclear rockets and missiles numbered eleven in 1961 and generally involved a training version equipped with dummy warheads, or ballast rounds equally devoid of an atomic charge. Nonetheless, though most of them involved substitute weapons, the implication remained clear. The same mishaps would have occurred if tactical nuclear weapons had been in use. Therefore, for purposes of nuclear accident prevention, they counted as nuclear episodes.

The F-101B/MB-1 weapon system was responsible for six of the occurrences. On 1 June, the forward launch lugs of an MB-1T training rocket failed on an F-101B of the 4750th Test Squadron (Tyndall), because the linkage of the rocket ejector rack had worked out of adjustment. Consequently, the MB-1T rocket hung loose in the armament bay,

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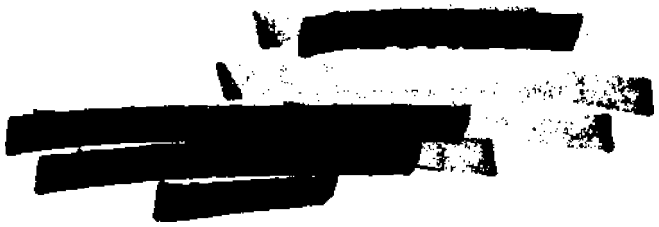
83. ADC, Ofc Ch of Safety, Project 10B Accident/Incident List for 1960, 27 Jan 1961 [Doc 714 in Hist of ADC, Jul-Dec 1961]; Msg ADCSA-M 1203, ADC to Air Divs, 21 Apr 1960 [Doc 232 in Hist of ADC, Jan-Jun 1960]; Msg ADMME-DE 1733, ADC to Air Divs, 13 Jun 1960 [Doc 236 in Hist of ADC, Jan-Jun 1960]; RESTRICTED DATA, Msg ADCSA-M 3102, ADC to Air Divs, 10 Nov 1960 [Doc 241 in Hist of ADC, Jul-Dec 1960]; FORMERLY RESTRICTED DATA, Msg ADCIG-I 004451, ADC ORI Team to USAF, 23 Sep 1960 [Doc 239 in Hist of ADC, Jul-Dec 1960].



but was subsequently eased out of the plane without further damage.

Two weeks later, an MB-1LT assigned to a detachment of the 322 FIS (based at Kingsly, but temporarily deployed to McChord) was damaged when the loading crew, during a practice mass-loading exercise, neglected to fit the aft launching lug properly to the aft hook. On 28 June, an F-101B of the 60th FIS (Otis) accidentally dropped an MN-11 Loader Trainer ballast round in flight while the armament door was rotating for an armament check. The MN-11 ballast round fell free after its aft launch lug became sheared.[84]

This was followed in July by two occurrences, the first of which also involved the aft rocket launch lug. Because a war reserve MB-1 was improperly installed aboard an F-101B of the 75th FIS (Dow) being readied for alert duty, its aft launch lug became disengaged from the aft hook as the armament door revolved. As a result, the MB-1 dropped

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84. Rpt, 4750 Test Sq, "Report of AF Missile Incident," 1 Jun 1961 [Doc 716 in Hist of ADC, Jul-Dec 1961]; Msg 551MME-Q 551 AEW&C Wg to OOAMA, ca. 29 Jun 1961 [Doc 717 in Hist of ADC, Jul-Dec 1961]; Msg 322FIS-MME 06-068, 322 FIS to USAF, 17 Jun 1961 [Doc 718 in Hist of ADC, Jul-Dec 1961]; Rpt, 60 FIS to ADC, "Investigation of MN-11 Incident 60 FIS, 28 Jun 1961," n.d. [Doc 719 in Hist of ADC, Jul-Dec 1961]; Ltr, AFSWC to USAF Dep IG for Safety, "Preliminary Summary of F-101B/MN-11 Incident," 10 Aug 1961 [Doc 720 in Hist of ADC, Jul-Dec 1961].

and became wedged between the armament door and fuselage,[85] breaking the MB-1's lower left fin.

Then, three days later, an F-101B of the 445th FIS (Wurtsmith) dropped an MB-1 ballast round in flight while rotating the armament door. Although the similarity between this incident and the loss of the MN-11 ballast round at Otis the month before was obvious, the blame could not be positively imputed to a sheared aft launch lug. When located, the MB-1 ballast round was so badly damaged that exact cause of the failure could not be ascertained. Nevertheless, it was surmised that either the aft or forward lugs had failed, or that the locking lug responsible for securing the rocket to the ejector rack had not been properly torqued because of a faulty helicoil.[86]

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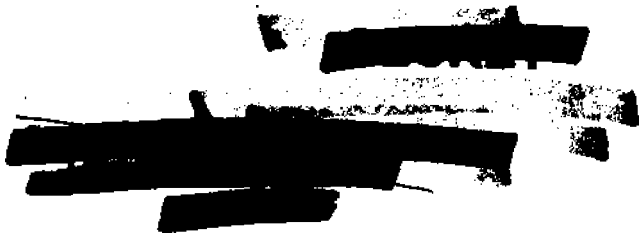
85. Rpt, 75 FIS to ADC, "Investigation of F-101B/MB-1 Incident," n.d. [Doc 721 in Hist of ADC, Jul-Dec 1961]; Msg ADCSA-M 1606, ADC to Air Divs, 1 Aug 1961 [Doc 722 in Hist of ADC, Jul-Dec 1961].

86. Rpt, 445 FIS to ADC, "Investigation of F-101B/MB-1 Ballast Round Incident," n.d. [Doc 723 in Hist of ADC, Jul-Dec 1961]; Msg DCMQ 27 N, 379 Bombardment Wg to WRAMA, 26 Jul 1961 [Doc 724 in Hist of ADC, Jul-Dec 1961]; Msg 445CSA D-89-10, 445 to 30 AD, 13 Oct 1961 [Doc 725 in Hist of ADC, Jul-Dec 1961]; Ltr, WRAMA to 30 AD, "Inadvertent Loss of MB-1 Ballast Round," 25 Oct 1961 [Doc 726 in Hist of ADC, Jul-Dec 1961]; 2nd Ind, 30 AD to ADC, 15 Nov 1961 to Ltr, 445 FIS to 30 AD, 17 Aug 1961 [Doc 727 in Hist of ADC, Jul-Dec 1961]; Ltr and Ind, 445 FIS to SMADS, "Supplemental Report of Investigation of Nuclear Incident of 21 Jul 1961," 5 Dec 1961 [Doc 728 in Hist of ADC, Jul-Dec 1961].



In any event, USAF became concerned over the prospects of losing a tactical MB-1 during an F-101B mission, and suggested that ADC's requirement for F-101B's to transport MB-1's as part of the upcoming dispersal plan might be rejected unless something was done soon. ADC reminded USAF that the two instances of ballast loss occurred while the F-101B armament door was rotating and assured USAF that the tactical ferrying of MB-1 weapons during dispersal would in no way involve rotating the door.[87]

Meanwhile, something was being done. The problem, not being a simple one, was researched at several places. Immediately following the episode at Otis (on 28 June), OOAMA began to conduct engineering test on the aft launch lug. WRAMA embarked on an engineering study of the rocket ejector rack, and AFSWC investigated the history of past occurrences of this kind prior to 1961.[88] By late August, OOAMA had concluded (despite a recommendation from one of

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87. Msg AFOOP-DE 88732, USAF to ADC, 26 Jul 1961 [Doc 729 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-DE 1642, ADC to USAF, 4 Aug 1961 [Doc 730 in Hist of ADC, Jul-Dec 1961].

88. IOC, ADMME-DE to ADCSA-M, "MN-11 Incident, 60 FIS, 28 Jun 1961," 25 Aug 1961 [Doc 731 in Hist of ADC, Jul-Dec 1961].

[redacted]

its directorates that the aft lug be strengthened by enlarging its diameter) that the aft lug, by passing tensile strength and shearing tests, proved "fully capable of supporting the [MB-1] rocket under normal conditions." Pointing out that the F-101B at Otis was maneuvering at the time its MN-11 aft launch lug was sheared, OOAMA reasoned that the lug had been subjected to an abnormal combination of tensile and shear stresses exceeding its design parameters. It was therefore regarded as an isolated instance, unlikely to recur.[89]

AFSWC was of the opinion that had the armament door been rotated at a slower speed, as prescribed by a Time Compliance Technical Order (TCTO) issued in January 1961, it was probable that neither of the two accidental drops would have happened. McDonnell, the builder of the F-101B, had endorsed this solution in 1960 after investigating three previous inadvertent rocket releases by F-101B's. The TCTO had not been performed on the F-101B aircraft involved, however, because of a lack of funds and manpower at OOAMA. AFSWC was convinced that slower rotation of the armament

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89. Ltr, and Atchs, OOAMA to ADC, "Failure of Aft Launching Lug, MB-1 Rocket," 24 Aug 1961 [Doc 732 in Hist of ADC, Jul-Dec 1961].

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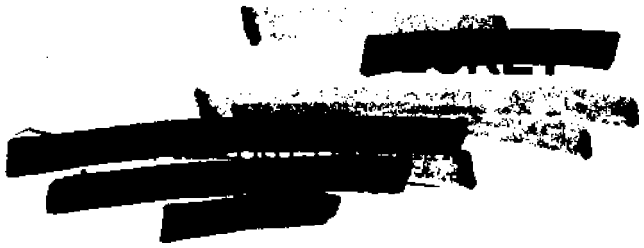

door would reduce the dynamic loads on the suspension hooks,[90] and in turn reduce the dynamic loads on the launching lugs.

WRAMA, meanwhile, came up with an interim solution pending a final "fix." Technical Order IF 101B-773 of late July called for replacement of worn preload torque bolts and helicoil inserts on ejector racks. This order created a maintenance task of some magnitude, since it was discovered at Tyndall, for example, that all helicoil inserts were defective. It was suspected that, in certain cases, faulty helicoils had caused false readings during the torquing process, resulting in improper tightening of the rocket release mechanism. Later, a snap lock was devised to prevent the preload torque bolt from loosening under the stress of heavy vibrations, while the eye bolt was studied for possible redesign so the helicoil would maintain a fixed position, as it was supposed to do under torquing pressures. Even so, these innovations constituted only another interim "fix" as WRAMA moved on to more tests

90. Msg SWVGT-4-8-19, AFSWC to WRAMA, 4 Aug 1961 [Doc 733 in Hist of ADC, Jul-Dec 1961]; Ltr, AFSWC to Dep IG for Safety (USAF), "Preliminary Summary of F-101B/MN-11 Incident," 10 Aug 1961 [Doc 720 in Hist of ADC, Jul-Dec 1961]; Msg SWUNT-10-10-15, AFSWC to OOAMA, 10 Oct 1961 [Doc 734 in Hist of ADC, Jul-Dec 1961].

and experiments during 1962 in search of a permanent cure for the chronically ailing F-101B ejector racks.[91]

The last nuclear occurrence of 1961 involving the F-101B/MB-1 weapon system took place on the ground. During a check of F-101B armament release apparatus on 14 August in the alert hangar of the 49th FIS (Griffiss), the loaded right rack instead of the empty left rack was tripped and a tactical MB-1 was accidentally dropped. The MB-1 struck a trailer positioned beneath it and suffered structural damage, although no explosion resulted. Also in August, three of four nuclear occurrences involving the F-102A/GAR-11 system took place. On 8 August, during a practice loading session at the 331st FIS (Webb), a GAR-11 attached to an F-102A was damaged when its MF-9 missile trailer lift, while being withdrawn from beneath the plane, accidentally struck and bent a fin. Two weeks later, at the 482nd FIS (Seymour Johnson), another GAR-11 was damaged under similar circumstances and on the 30th of August, almost

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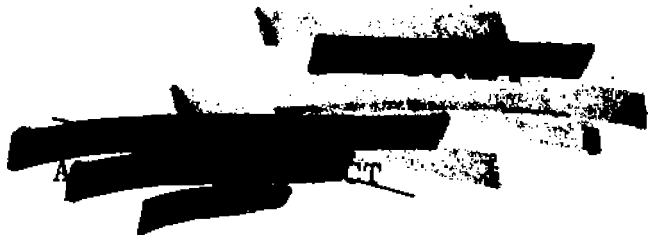
91. Msg WRNQ 56372, WRAMA to 56 Ftr Wg, et al, 22 Jul 1961 [Doc 735 in Hist of ADC, Jul-Dec 1961]; Msg ADMME-DE 1582, ADC to WRAMA, 27 Jul 1961 [Doc 736 in Hist of ADC, Jul-Dec 1961]; NOFORN EX CANADA, Msg ADMME-DE 1612, ADC to WRAMA, 1 Aug 1961 [Doc 737 in Hist of ADC, Jul-Dec 1961]; Msg WRMQS 61138, WRAMA to USAF Dep IG for Safety, 8 Aug 1961 [Doc 738 in Hist of ADC, Jul-Dec 1961].



the same thing happened at the 82nd FIS (Travis). The last of the F-102A/GAR-11 nuclear incidents took place on 31 October, when a missile bay door lock fell and dented a GAR-11 training missile. This occurred at the 64th FIS (Paine) during a weapon launch system check.[92]

The only nuclear episode involving the F-106A/MB-1 system during 1961 took place 22 August at the Tyndall training center. An F-106A from the 71st FIS (Selfridge), while on a rocket firing mission, received considerable damage to its armament bay doors and the MB-1T it carried when the missile doors opened shortly after the fire control system locked on the target, then clamped shut on the rocket as it began to fall. The MB-1T tail fins were broken,

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92. FORMERLY RESTRICTED DATA, Msg 49CSA-F-32H, 49 FIS to USAF, 18 Aug 1961 [Doc 739 in Hist of ADC, Jul-Dec 1961]; FORMERLY RESTRICTED DATA, Ltr, AFSWC to USAF Dep for Nuclear Safety, "Preliminary Summary of F-101B/MB-1 Incident," 25 Aug 1961 [Doc 740 in Hist of ADC, Jul-Dec 1961]; Msg 331CSA-M-922/61, 331 FIS to USAF, 15 Aug 1961 [Doc 741 in Hist of ADC, Jul-Dec 1961]; Msg MANBS 79173, MAAMA to 331 FIS, 23 Aug 1961 [Doc 742 in Hist of ADC, Jul-Dec 1961]; Msg 482MME-AE 8-46, 482 FIS to USAF, 29 Aug 1961 [Doc 743 in Hist of ADC, Jul-Dec 1961]; Msg 482MME-AE 9-4, 482 FIS to USAF Dep IG for Safety, 6 Sep 1961 [Doc 744 in Hist of ADC, Jul-Dec 1961]; Msg 82CSA 8-128, 82 FIS to USAF, 1 Sep 1961 [Doc 745 in Hist of ADC, Jul-Dec 1961]; Msg MANBRS 86377, MAAMA to 82 FIS, 7 Sep 1961 [Doc 746 in Hist of ADC, Jul-Dec 1961]; Msg 57ODC 11-3209, 57 Ftr Gp to USAF, 4 Nov 1961 [Doc 747 in Hist of ADC, Jul-Dec 1961].

the nose cone was crushed and the fusing mechanism was destroyed.[93]

Of the mishaps occuring in 1962, about three-fourths were attributable to personnel error, mostly during the loading and unloading process, and one-fourth to materiel failure. The ultimate objective, of course, never ceased being zero per cent in the accident category, called "Broken Arrow," which pertained to nuclear weapons lost in flight or detonated, and in the incident category, called "Bent Spear," pertaining to nuclear armament damaged or malfunctioned seriously enough to warrant their return to the AEC for repair. A third category, labeled "Dull Sword," was added during 1962 to cover nuclear safety deficiencies involving damage, malfunctions and failures so slight (such as scratches and bent fins) that they could be repaired by USAF field depot units. Moreover, damage to, or loss of MB-1 and GAR-11 training rounds lacking warheads came under this third category, in addition to defects and malfunctions in equipment employed for handling, loading, storing, maintaining,

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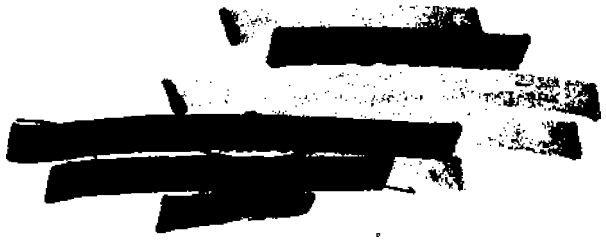
93. Msg 73CSA 40H, 73 AD to USAF, 22 Aug 1961 [Doc 748 in Hist of ADC, Jul-Dec 1961]; Msg 73CSA 42H, 73 AD to USAF, 25 Aug 1961 [Doc 749 in Hist of ADC, Jul-Dec 1961]; Msg 30CSA 0835, 30 AD to DEADS, 30 Aug 1961 [Doc 750 in Hist of ADC, Jul-Dec 1961].



transporting and testing nuclear armament while in use with the MB-1 or GAR-11. Over a third of the 1962 "Dull Sword" incidents involved MB-1 heater blankets for example. Other deficiences were grouped under the "Dull Sword" category as well.[94]

Those incidents directly connected with nuclear air-to-air missiles or their training counterparts (equipped with dummy warheads) numbered about fifteen. They were nearly evenly divided between GAR-11 and MB-1 episodes or their training versions. Three of the eight GAR-11 involvements occurred at the 76th FIS (Westover), where on January 2 and 10, armament crews, during uploading operations, punctured two GAR-11's and on June 18, a GAR-11 was discovered to be defective because two pins were lodged in the rubber base of its warhead wiring. Two GAR-11 incidents occurred at the 82nd FIS (Travis), where a fin of a GAR-11 training round (lacking nuclear warhead), was dented when

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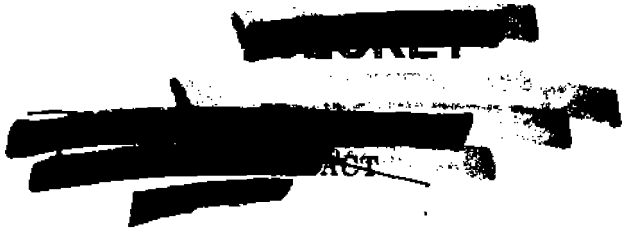
94. Msg AFCIG 1484/62, USAF to All Major Cmds, 28 Aug 1962 [DOC 312]; ADC, Charts and Graphs, ADCSA, "Summaries of 1961-1962 Air-to-Air and Ground-to-Air Accidents/Incidents," n.d., ca. Jan 1963 [DOC 313]; Mins of Mtg and Atch, ADC, ADCSA, "Minutes of Missile/Nuclear Safety Council," and presentation to the Council of 1962 Bent Spears and Dull Swords, 23 Jan 1963 [DOC 314]; ADC Munitions Bulletin No. 63-2, 15 Feb 1963 [DOC 86]; ADC Munitions Bulletin, No. 63-3, 15 Mar 1963 [DOC 118].

it struck an MF-9 trailer on January 18, and where a GAR-11 was scratched while undergoing a console checkout on August 2. Only a few weeks before, on July 16, a GAR-11 was scarred during a rail loading operation at the 331st FIS (Webb). And in November, two GAR-11's belonging to the 328th Fighter Wing (Richards-Gebaur) were dented during the loading process at the Grand Island Dispersal base, the first happening on November 7 and the second, on November 20.

But the MB-1 inventory did not escape without its share of troubles for the year, though like the GAR-11 inventory, none of the mishaps proved drastic enough to detonate a weapon. In two instances, at the 408th Fighter Group (Kingsley) on January 4, and at the 414th Fighter Group (Oxnard) on March 8, initiator pins were inadvertently pulled. Between times, on February 27, an MB-1 was discovered with a dent in its warhead at the 75th FIS (Dow), rendering suspect the MF-9 trailer employed during the uploading process. Mounting lugs that shook loose in flight resulted in damage to an MN-11 training round belonging to the 78th Fighter Wing (Hamilton) on July 9, and similarly to an MN-11 round of the 414th Fighter Group (Oxnard) on September 12. Both instances smacked suspiciously of the ejector rack troubles that had hounded the F-101B fleet



since 1959-60. About three weeks later, on October 4, a third MB-1 dummy training rocket was discovered damaged during a periodical inspection at the 456th FIS (Castle). Since an electrical connector had become separated after several screws broke, it was surmised that an armament crew, when mating the dummy missile to an F-101B rack, had misaligned the missile the last time it was employed for training purposes. Perhaps the worst mishap in the MB-1 category, and the last one for the year, was caused by the 1st Fighter Wing on December 15 during a cold snap at Selfridge. Ground servicing crews activated MC-1 heaters to warm MB-1's loaded on alert F-106A's for maintaining MB-1 rocket motor operating temperatures. The hose of one MC-1, however, was inadvertently connected to the wrong heater outlet. Consequently, heat in excess of 150 degrees -- more than twice as hot as desired -- was funnelled onto one MB-1, melting its High Explosive to a plastic state. No explosion resulted, fortunately.[95]

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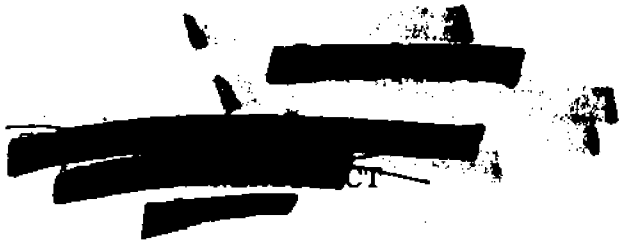
95. Msg 76CSA 0042, 76 FIS to USAF, 5 Jan 1962 [from ADCSA-W files]; Rpt, AF FM 711, 408 Ftr Gp to USAF, "USAF Accident/Incident Report," Serial No. NI 012, Jan 1962 [from ADCSA-W files]; Msg 76MME-AM0101, 76 FIS to USAF, 16 Jan 1962 [from ADCSA-W files]; Msg 82CSA-1-115, 82 FIS to USAF, 25 Jan 1962 [from ADCSA-W files]; RESTRICTED DATA, Msg 75CSA2-21 S, 75FIS to USAF, 27 Feb 1962 [DOC 315]; Msg 1616C, 414 Ftr Gp to USAF, 8 Mar 1962 [DOC 316]; RESTRICTED DATA, Msg 76MME-AM

As in past years no episodes occurred during the first six months of 1963 that caused detonation of the HE element in any nuclear air-to-air rockets, let alone trigger a full-scale atomic detonation. As a result of the "Dull Sword" category of mishap (introduced late in 1962 to bring to light lesser deficiencies in atomic armament and allied support equipment), more of this type of occurrence was reported. In several instances MB-1 heater blankets were damaged by armament crewmen or by the cradle strap latch of the MF-9 trailer, for which a modification was effected. As usual, personnel error accounted for the majority of mishaps.

[Cont'd] 1130, 76 FIS to Dir Nuc Safety (Kirtland), 18 Jun 1962 [DOC 317]; FORMERLY RESTRICTED DATA, Msg 507WG-CSA C-2-62, 507 Ftr Wg to USAF, 9 Jun 1962 [DOC 318]; Msg 32FSWA 06-3028, 32 Ftr Wg to USAF, 20 Jun 1962 [DOC 319]; Msg WGCSA-M3076, 78 Ftr Wg to USAF, 10 Jul 1962 [DOC 320]; Msg ADMME-EA 1842, ADC to WRAMA, 11 Jul 1962 [DOC 321]; Msg WGCSA-M 2177, 78 Ftr Wg to USAF, 12 Jul 1962 [DOC 322]; Msg 331CSA 755/62, 331 FIS to USAF, 21 Jul 1962 [from ADCSA-W files]; FORMERLY RESTRICTED DATA, Msg S-8-050-C, 3096 Avn Dep Sq (Travis) to USAF, 3 Aug 1962 [DOC 323]; Msg MANBSS 100097, MAAMA to ADC, 13 Aug 1962 [DOC 324]; RESTRICTED DATA, Msg 414CSA-M/N 62S485, 414 Ftr Gp to ADC, 19 Sep 1962 [DOC 325]; Msg 414CSA-M 33021, 414 Ftr Gp to USAF, 13 Sep 1962 [DOC 326]; Msg 456CSA-M 1402, 456 Ftr Gp to USAF, 12 Oct 1962 [DOC 327]; Msg 328 FWCVC-S 6993, 328 Ftr Wg to USAF, 10 Nov 1962; Msg 328FWCVC-S 7105, 328 Ftr Wg to USAF, 21 Nov 1962 [DOC 328]; Msg IWCSA S-62-210, 1st Ftr Wg to USAF, 19 Dec 1962 [DOC 329]; Msg ADMME-EB 3538, ADC to Air Divs, 26 Dec 1962 [DOC 330]; RESTRICTED DATA, Msg AFINS-E-1-1-67-63E, Dep Tig USAF to ADC, 22 Jan 1963 [DOC 331]; RESTRICTED DATA, Msg AFINS-E-1-5-20-63E, Dir Nuc Safety to ADC, 9 May 1963 [DOC 332].



The first instance directly involving nuclear armament and most serious by USAF standards, concerned a violation of the two-man concept at the 432nd FIS (Seymour-Johnson) on 7 February 1963. When informed that a lone armament technician had been allowed to deliver two GAR-11's from the storage to the alert area without the required security escort,* USAF heatedly complained:

> The incident...is considered by this Headquarters to be one of the most serious examples of violation of the precepts of the entire USAF nuclear safety program yet reported....The seriousness of the situation which allowed a single individual at night the uninterrupted opportunity to take any action he desired with two nuclear weapons cannot be under emphasized.

A formal investigation was immediately launched, and corrective measures established to preclude a recurrence of this violation.[96]

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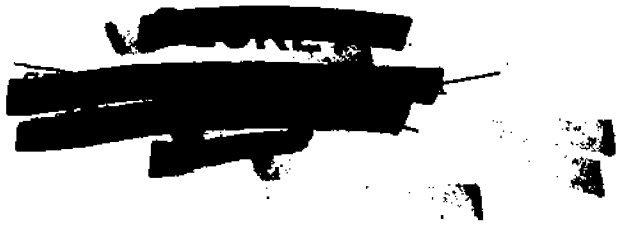
96. Mins of Missile/Nuclear Safety Council Mtg, 18 Jul 1963, 19 Jul 1963 [DOC 333]; FORMERLY RESTRICTED DATA, Msg 482 CSA-S C-13, 482 FIS to USAF, 9 Feb 1963 [DOC 334]; *RESTRICTED DATA, Msg AFINS-W-2-2-48-63E, Dep TIG USAF (Kirtland) to ADC, 16 Feb 1963 [DOC 335]; Msg 482CSA-S 63-249, 482 FIS to USAF, 16 Feb 1963 [DOC 336]; RESTRICTED DATA, Msg ADCSA-W 578, ADC to 26 AD, 26 Feb 1963 [DOC 337]; FORMERLY RESTRICTED DATA, Msg ADCSA-W 934, ADC to Dir Nuc Safety (Kirtland), 27 Mar 1963 [DOC 338]; FORMERLY RESTRICTED DATA, Msg 507WG-MDC-MME 63-S-19, 507 Ftr Wg to Nuc Safety Dir (Kirtland) 27 May 1963 [DOC 339]; Msg CAS 5-41, 27 FIS to USAF, 28 May 1963 [DOC 340]; Msg FIS49-ODC-5-3, 49 FIS to USAF, 29 May 1963 [DOC 342]; Msg CAS 5-42, 27 FIS to USAF, 28 May 1963 [DOC 341]; Msg 507WG-MDC-MME 63-5-23, 507 Ftr Wg to Dir of



A week afterward, another tactical weapon -- this time an MB-1 -- was also involved in an incident because of personnel error. An armament crew at the 87th FIS (Lockbourne) was guilty of misaligning an aft lug of a "Genie" when affixing it to the launcher rack of an F-101B being readied for alert duty. Consequently, when the F-101B armament door was rotated, the MB-1 slipped from position, cracking a fin in the process. Similar episodes had occurred at the 29th FIS (Malmstrom) in September 1960, at the 322nd FIS (Kingsley) in June 1961, and at the 75th FIS (Dow) in July 1961, as noted above. The next episode involving a tactical MB-1, which took place that same month (20 February 1963) at the 84th Fighter Group (servicing the 498th FIS at Spokane), was less serious by comparison. Again because of personnel error, an MB-1 was jeopardized, but fortunately not harmed, when an airman caused a gate to close prematurely, catching a "Genie"-loaded trailer in an MB-1 convoy

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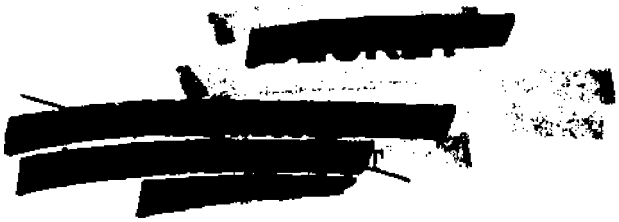
[Cont'd] Aerospace Safety, 18 Jun 1963 [DOC 343]; Msg SAN88201, SAAMA to ADC, 23 May 1963 [DOC 344]; Msg 88233, SAAMA to MAAMA, 31 May 1963 [DOC 345]; Msg ADCIG-I 2600, ADC to Dir of Nuc Safety, 3 Jul 1963 [DOC 346].



returning to storage. Aside from a bent gate frame, damage was slight, involving mostly the MF-9 trailer.[97]

On 4 March, a little over a week later, an incident occurred at the 98th FIS (Dover) that hearkened back to ejector rack troubles that had dogged ADC's F-101B fleet for years. After an inert version of the MB-1 was loaded on an F-101B, the ejector rack was improperly torqued. The launcher hooks, rather than securely fasten the missile by the torquing process, allowed the missile to squeeze past a slight opening. The loading crew managed to catch the missile as it fell, thus averting injury to it. During most of 1962, WRAMA had continued testing F-101B ejector rack hook linkages as they were affected by the pre-load torquing process (designed to remove existing slack). New preload bolts were tried, omitting helicoil inserts altogether, but this failed to solve the problem. The tests conducted in 1962 proved frustrating at first, since little headway was forged toward a permanent "fix" before mid-year. It was even proposed at one time that the entire ejector rack be redesigned. Finally a solution was found in a redesign

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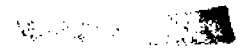
97. Msg 87-CSA100-63, 87 FIS to USAF, 17 Feb 1963 [DOC 347]; RESTRICTED DATA, Msg 84CSA-M14, 34 Ftr Gp to Dir Nuc Safety (Kirtland), 22 Feb 1963 [DOC 348].



of the helicoil insert itself. The helicoil was lengthened and staked to prevent movement when preload bolts (which also were improved in design) were tightened or loosened. Replacement of helicoil inserts was incorporated as part of a technical order 11B29-3-20-507 scheduled to be made available in December 1962, but not actually distributed in time to prevent the incident at the 98th FIS in March 1963. It was expected that this technical order, once applied, together with T.O. 11B29-3-20-508 calling for readjustments of the linkage (issued in late 1963), would finally remedy the F-101B's chronic ejector rack problems.[98]

On March 12, an MB-1 at the 408th Fighter Group (servicing the 322nd FIS at Kingsley) was found to have a dented casing. Personnel error was blamed for the damage because the same "Genie" had been bumped several months earlier while being transferred from an MF-9 trailer to a pallet.[99]

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98. Msg 98CSA3-5-1, 98 FIS to USAF, 5 Mar 1963 [DOC 349]; Rpt, 4750 Test Sq (73AD), Final Report Project ADC/73AD/62-14/F-101B/MB-1 Ejector Rack Preload, 17 Aug 1962 [DOC 350]; ADC Munitions Bulletin No. 62-11, 15 Nov 1962 [DOC 351]; Mins, OOAMA Flight Safety Materiel Deficiency Task Group Mtg, 5 Sep 1962 [DOC 352]; ADC Munitions Bulletin No. 63-4, 15 Apr 1963 [DOC 93]; Msg ADMME-EA 08178, ADC to USAF, 8 Mar 1963 [DOC 353]; ADC, ADCSA, Resume of F-101B/MB-1 Rack Problems, n.d.(ca. Apr 1963) [DOC 354].

99. RESTRICTED DATA, Msg 408 CSA 3 0888, 408 Ftr Gp to Dir Nuc Safety, 14 Mar 1963 [from ADCSA files].

[redacted]

Near the end of March, a mishap occurred at Goose, where the F-102A's employed by the 59th FIS, though modified to carry live GAR-11's, were limited to the use of inert training versions as long as ADC lacked authorization to store nuclear armament on Canadian soil. It was while transporting a missile on 29 March over a rutted, slippery road that an inert GAR-11 tumbled off its trailer and bounced on the ice. A faulty quick release pin on the rail assembly of the trailer was declared to be the cause. The GAR-11 training missile was split, chipped, and bent in several places.

The final mishap of the season, while not resulting in damage to a tactical or training version of a nuclear weapon, caused many an eyebrow to raise. A bolt of lightning, struck an F-106A belonging to the 48th FIS (Langley) during flight. Fortunately for both pilot and interceptor, nothing permanently disabling resulted. However, the abnormally high electrical surge had triggered the primary armament circuitry, even possibly causing the missile bay doors to open and shut. While it was concluded that a live MB-1, given the same circumstances, would not experience a full-scale atomic detonation because the in-flight ejector rack

[redacted]

lock, by remaining steadfastly engaged, would prevent a launching, this offered little solace to the pilot. It was felt that the rocket motor would ignite, destroying the aircraft in the process.[100]

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100. Msg AFIAS-R1 03 080, Dep TIG USAF to MAAMA, 6 Apr 1963 [DOC 355]; Msg ADCSA-W ALADC 936, ADC to ALADC, 2 May 1963 [DOC 356]; Msg ADMME-CB 1829, ADC to AFWL, 14 May 1963 [DOC 357].

[redacted]

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