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HISTORY OF THE STRATEGIC AIR COMMAND

January 1950 - 30 June 1954

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Nuclear Weapons Development

Introduction. The SAC strike force had available at least one nuclear weapon per bomber and ready access to them through its bombs-on-base program and its overseas weapons storage areas. 150

147. Interview, T/Sgt A. W. Scott with CWO Smith, 17 Jul 1958; Msg, from USAF to CINCSAC, Comdr AMC, Comdr 1823 AACCS Gp, CT AFMME-CE-38045, subj "High Power SSB at Barksdale and Offutt," 9 Jul 1958.

148. Ibid.

149. Ibid.

150. SAC was still required to maintain a conventional bombing capability. In a 1 November 1957 letter to General White, the CINCSAC questioned the need to continue conventional bombing capability in the B-47 force because of the severe penalty it placed on SAC's capability to fight either an effective local or general war. General White replied that the nation required flexibility to combat limited aggression. He said, "It is the policy of the United States to place main, but not sole, reliance on nuclear weapons." (Info from Ltr, T. S. Power, CINCSAC, to Gen T. D. White, CofS, USAF, 1 Nov 1957 (B-63470), Exhibit 51; Ltr, Gen T. D. White, CofS, USAF, to Gen T. S. Power, CINCSAC, 16 Dec 1957 (B-64124), filed in Planning Documents Group, Progs Div, D/Plans, Hq SAC.

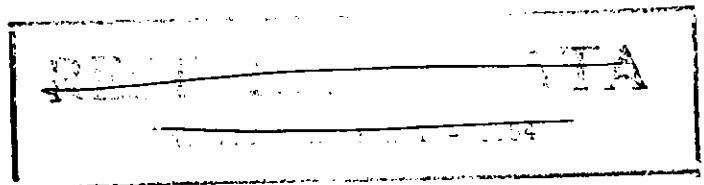
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The command's prime concern in the field of nuclear weapons development during the first six months of 1958 was to obtain authority to exercise its Alert Force with complete nuclear weapons on board. Because of safety considerations, emphasis was placed on using the new sealed pit weapon. During the same period SAC also reaffirmed its requirement for a 60 megaton bomb for use with the B-52 portion of the Alert Force. Significant progress was also made during the period January through June 1958 in the SAC-RAF Bomber Command Atomic Coordination Program. SAC sought to coordinate atomic strike plans and actual combat operations between SAC and Bomber Command and to develop plans to provide United States atomic weapons for the RAF "V" Force.

Maneuver Authority. With the achievement of an Alert Force in-being in the ZI and overseas, SAC was prepared to launch aircraft within minutes after receiving notice of impending attack. Constant and realistic training was required to maintain this force in its high state of readiness. As of 30 June 1958, however, General Power did not have authority to launch alert aircraft with nuclear capsules on board, except under certain emergency conditions. This was due to



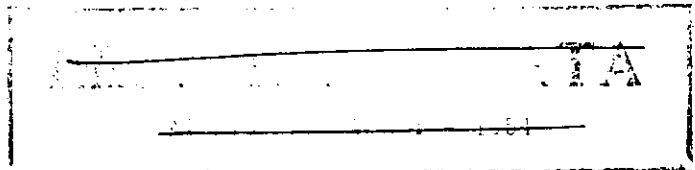
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restrictions placed on weapons maneuvers by Department of
 Defense (DOD) and Atomic Energy Commission (AEC) agreements. ¹⁵¹

The importance of the SAC mission demanded that the com-
 mand possess an effective EWP capability at all times. In a
 15 October 1957 letter to General T. D. White, Chief of Staff,
 USAF, General Power expressed concern over the fact that he
 was restricted from exercising any portion of the Alert Force
 on a realistic "no-notice" basis. ¹⁵² The critical element of

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151. DF, Brig Gen J. V. Edmundson, Dep Dir of Ops, Hq SAC, to
 D/M, D/Pl, Comd Sect, Hq SAC, "Authority to Exercise the
 SAC Alert Force," 10 Oct 1957, Exhibit 52; DF, DOOP to
 Dir of Ops, Hq SAC, "History of SAC, Jan-Jun 1958," 2
 Sep 1958, filed in OIH, Hq SAC.
152. SAC had previously attempted to obtain permission to fly
 weapons with capsules on board and inserted. In September
 1957 a request to exercise the REFLEX ACTION force in
 North Africa was disapproved. USAF did recognize the limi-
 tation this placed on SAC's realistic training program,
 however, and informed this command that a Joint Chiefs
 of Staff (JCS) paper was being prepared to authorize
 flying atomic weapons with nuclear capsules installed
 for testing capability. SAC was authorized to airlift
 nuclear capsules during the two large scale exercises
 conducted during October and November 1957 (DARK NIGHT
 and IRON BAR). Both the AEC (custodian of the weapons)
 and Hqs USAF granted this authority with the condition
 that the capsules would be carried in the crew compart-
 ment. (Info from Ltr, Gen T. S. Power, CINCSAC, to Gen
 T. D. White, C/S USAF, 15 Oct 1957, Exhibit 53; DF, Brig
 Gen J. V. Edmundson, Dep Dir of Ops, Hq SAC, to D/M,
 D/Pl, Com Sec, "Authority to Exercise the SAC Alert
 Force," 10 Oct 1957, Exhibit 52).



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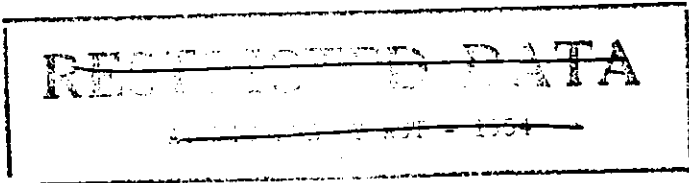
time did not permit removal of weapons and nuclear components prior to launching aircraft, but to remove them prior to notice would result in a loss of experience gained from "no-notice" capability tests.

Because of the additional hazard caused by airlifting atomic weapons with nuclear capsules installed in the in-flight insertion mechanism, in early 1957 SAC asked Air Research and Development Command (ARDC) to conduct a study to determine if the safety features in weapon designs and procedures were adequate to prevent accidental or premature detonation. The general conclusions for weapons stockpiled by SAC were that the design features and procedures provided "adequate" safety to crews and friendly populaces provided standard operating procedures were rigidly followed.

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General White's reply of 31 October to General Power expressed agreement with SAC's requirement to test the Alert Force under realistic conditions. He suggested, however, that SAC consider testing that part of the force destined to be armed

153. Ltr, Gen T. S. Power, CINCSAC, to Gen T. D. White, CofS, USAF, 15 Oct 1957, Exhibit 53.



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with sealed-pit weapons.

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whereas there was a 15 percent probability of up to 40,000 pounds of nuclear yield in the event of one point detonation of a weapon requiring the

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154. A description of the sealed pit weapon and further explanation of why it represented a significant advancement in weapons development is in order. The sealed pit atomic device normally associated with the so called "new family" of weapons consists of a metal sphere and explosive lens charges similar to the older type bomb. The term "pit" as applied to nuclear weapons is a descriptive word which refers to a hollow sphere made of metal which is the intermost part of the bomb and is necessary to start a nuclear reaction. The term "sealed" is used to indicate that the pit has no opening to the outside of the bomb, but is a complete sphere and is closed to atmospheric pressure.

The principal difference between the sealed pit weapon and the older types is in the composition of the "pit." The pit walls of new weapons were made of a very thin layer of active material, whereas the older type pit walls did not contain active material. To the pit is connected, by a small pipe, a cylinder of active gas. This is known as the gas boosted principle and replaces the capsule ball. The desired nuclear reaction of a nuclear weapon is obtained as a result of simultaneous squeeze of active material for a specific period of time. These requirements are not as critical in the older weapon as they are in the new sealed pit types. Therefore, the older weapon may produce a nuclear yield if fired by some other means than the weapon circuit, whereas the new sealed pit will not. Should the weapon explode as a result of impact or fire the explosion will be from the high explosive content of the weapon, not the nuclear material. Hence, the sealed pit weapon is considered "one point safe." (Info from DF, Armt Elec Div, D/M, to OI, Attn: OIH, "Information for History of Nuclear Weapons," 3 Oct 1958, filed in OIH, Hq SAC. For an historical summary of SAC nuclear weapons and their characteristics see Chart, "Summary of Nuclear Weapons . . .," Sec II; See also History of 8AF, Jan-Jun 1958, Vol I, pp 165-208, filed in OIH, Hq SAC, for additional information on sealed pit weapons.

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insertion of an in-flight capsule, with the sealed pit
weapon the plutonium hazard was not significant. ¹⁵⁵

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Initially, General Power found General White's proposal unacceptable because SAC had no sealed pit weapons in stockpile and it was thought that it would be some time before a substantial number would be available. By 26 November 1957, however, new weapon production figures together with the sealed pit modification schedule, indicated SAC would get a significant number of the weapons earlier than was first anticipated. General Power anticipated a portion of the Alert Force would be equipped with these weapons by February 1958. By the following May the entire ZI Alert Force would be completely armed (MK-15 and MK-39 weapons).¹⁵⁶ This proved to be an optimistic forecast, however; the first weapons did not arrive until June 1958.¹⁵⁷ Not until November 1958 would the MK-36 bomb be modified for use by the overseas "REFLEX" force.¹⁵⁸

- 155. Ltr, Gen T. D. White, CofS, Hq USAF, to Gen T. S. Power, 31 Oct 1957, Exhibit 54.
- 156. Ltr, Gen T. S. Power, CINCSAC, to Gen T. D. White, CofS, USAF, 26 Nov 1957, Exhibit 55.
- 157. DF, DOOP, to Dir of Ops, Hq SAC, "History of Strategic Air Command," Jan-Jun 1958, 2 Sep 1958, filed in OIH, Hq SAC.
- 158. Ltr, Gen T. S. Power, CINCSAC, to Gen T. D. White, CofS, USAF, 26 Nov 1957, Exhibit 55.

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Although no sealed pit weapons were available to SAC in late 1957, General Power requested of General White that a higher priority be given to obtaining authority to test launch the Alert Force with these weapons. ¹⁵⁹ On 19 December 1957 a reply from General LeMay assured General Power that "Every effort will be made to obtain the required authority to exercise . . . with sealed-pit weapons as soon as possible." ¹⁶⁰

But no early decision was forthcoming. Strategic Air Command re-stated its position on flying war reserve weapons in early May 1958: ¹⁶¹

To provide a realistic no-notice test of the alert force, weapons must be flown. During Unit Simulated Combat Missions in order to generate and launch on an EWP schedule while exercising all phases of ground support it is mandatory to fly this weapon.

The initial release of MK-15 Mod 2 and MK-39 Mod 1 sealed-pit weapons came in early May. Although the release gave technical approval for maneuver and readiness exercises of these weapons, the AEC cautioned that their use was ". . . administratively prohibited pending policy agreement between AEC and DOD." ¹⁶²

- 159. Ibid.
- 160. Ltr, Gen C. E. LeMay, VCS, USAF, to Gen T. S. Power, CINCSAC, 19 Dec 1957, Exhibit 56.
- 161. TWX, CINCSAC to CofS, USAF, DOOPW 5639, "Maneuver of Weapons," 9 May 1958, Exhibit 57.
- 162. TWX, James L. McCraw, USAEC, Albuquerque, N. Mex, to ComAF 2, 8, 15, 16, et al, 7 May 1958, Exhibit 58; TWX, Hq AMC, W-PAFB, Ohio, to CofS, USAF, MCW 315561, 3 June 1958, Exhibit 59.

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Weapons could be loaded on alert aircraft, but not flown.

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Air Command had no initial difficulty in complying with this directive, because it did not receive its first sealed-pit weapons (MK-39 Mod 1) until 1 June 1958 at Loring AFB, Maine. By 30 June weapons were in place at Loring, Westover, Ellsworth, Fairchild, Pease, Plattsburgh, and Mountain Home AFBs. All were MK-39 Mod 1's except Mountain Home which received MK-15 Mod 2's.

A basic disagreement existed between the AEC and the JCS on the maneuvers of sealed-pit weapons. The AEC believed, in opposition to the JCS, that sealed-pit weapons should be maneuvered only in direct Alert Force exercises and not for training exercises ("no-notice" inspections, USCM's, etc.). The AEC favored using training devices for any training beyond Alert Force operations. The Commission maintained that since a hazard was associated with Alert Force use of sealed-pit weapons, ¹⁶⁴ Presidential

163. DF, DOOP, Hq SAC to D/Ops, Hq SAC, "History of Strategic Air Command, January-June 1958," 2 Sep 1958, filed in OIH, Hq SAC.
164. During the period 5 through 11 January 1958 the USAF Nuclear Weapon Safety Group convened at Kirtland AFB to review the safety aspects of the sealed-pit weapon. It was generally concluded that there was no significant degradation of safety when flying the weapons with safety pins installed and the U-2 rack locked, versus the stockpile configuration. There was, however, a significant degradation of safety if the weapon was involved in an aircraft crash or was jettisoned with the safety pins removed. The estimated probability of a nuclear detonation of the weapon in a crash with pins removed was one in ten thousand. The estimated probability of a nuclear detonation if the weapon was jettisoned or an inadvertent release occurred with pins removed was one in five hundred. (Info from Memo for General Terrill, from Col Roland A. Campbell, Ch, Ops Div, D/Ops, "(C) USAF Safety Review of Sealed Pit Weapons," 14 January 1958, Exhibit 60).

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approval was required annually for the exercises scheduled for
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the following year.

Strategic Air Command agreed with the JCS and the AFSWC
viewpoint that use of training shapes for EWP exercises was
operationally unsuitable. For the foreseeable future it would
be necessary for manned bombers to fly simulated combat mis-
sions with ground preparations, timing, launch, and tactics
approximating as nearly as possible the EWP. Strategic Air
Command needed to do this to develop a positive capability
to accomplish the unit assigned mission, and to test and
evaluate this capability. In line with this timing, it was
vitaly important that actual war reserve weapons be used
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to realistically exercise all supporting units.

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Other considerations bearing on the problem were:

a. Prior to 1955 when launch timing under the EWP
was measured in hours and days instead of minutes and
hours as of the present date, SAC was for the most part
limited to carrying training weapons and practice shapes.

165. DF, Col K. A. Reecher, Dep Ch, Plans Div, D/Pl, to Dir of
Ops, Attn: DOPLC, DOOPW, "Weapons Maneuver," 25 Jun 1958
Exhibit 61.

166. DF, Dir of Ops to Dir of Plans, "Weapons Maneuvers," 26 June
1958, Exhibit 62; TWX, CINCSAC to CofS, USAF, DPL 67679,
"Weapon Maneuver," (B-67679), 28 June 1958, filed in Ops
Plans Div, D/Ops, Hq SAC.

167. DF, Dir of Ops to Dir of Plans, "Weapons Maneuvers," 26
June 1958, Exhibit 62.

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It became evident at that time that to develop a realistic capability to execute the EWP and to further test and evaluate this capability, it would be necessary to prepare the aircraft with actual EWP weapons during USCM's. With the fast reaction time required at the present date, this has become a much more critical factor.

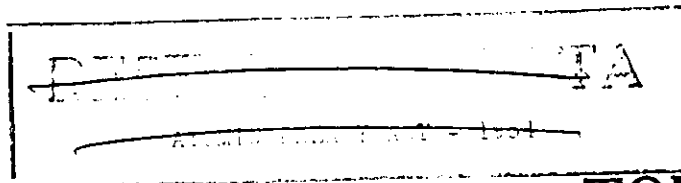
b. With sealed pit weapons on board during a USCM an aircraft would require only the necessary fuel to be ready for launch during an emergency. A training weapon on board would degrade the reaction time to an unacceptable degree.

c. It is considered highly desirable from the standpoint of unit and crew morale and motivation to maneuver with war reserve weapons.

d. Normally, not more than a total of seven (7) training weapons and practice shapes of a specific type at a SAC base are available. Additional practical shapes would have to be procured along with the necessary handling equipment.

In late June 1958 SAC responded to a USAF query about it's requirements for sealed-pit weapons maneuver authority for FY-59. The command needed weapons for the Alert Force, an Airborne Alert test, and miscellaneous USCM's, but it could not be final in its forecast of ultimate requirements because the lack of sealed-pit maneuver authority had not given SAC any operational experience. Initially, it was planned to test launch each unit's Alert Force once a year, repeating only when a unit fell below the prescribed standard. Due to problems such as uncertainty in the production availability of SAC's total allocated sealed-pit stockpile by quarter, and the problems involved in acquisition of suitable ATO drop

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areas, test launch of alert forces outside the ZI was doubtful
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during FY-59.

Second to ground alert force test launch requirements, SAC sought permission to use sealed-pit weapons in connection with the test of an Airborne Alert concept during FY-59. The test would be divided into two phases. The first phase would require 848 weapon maneuvers on 424 sorties; the second phase required 552 weapon maneuvers on 276 sorties. This was a total weapon requirement of 1,400 for both phases. Although a test, war reserve sealed-pit weapons were mandatory to ". . . avoid degradation of the unit's alert capability."
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Some weapons would also be required on the two USCM's per bomb wing scheduled for FY-59. None of these maneuvers were in the large scale category, nor would there be deployment to overseas areas. In late June 1958 SAC could not predict quantitative requirements for sealed-pit weapons for USCM's.
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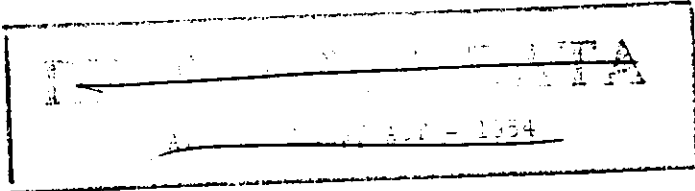
yet bombs were at Thule + Japan

* See Airborne Alert Concept, pp 58-65.

168. TWX, CINCSAC to CofS, Hq USAF, DPL 67679, "Weapons Maneuver," (B-67679), 28 June 1958, filed in Ops Plans Div, D/Ops, Hq SAC.

169. Ibid.

170. Ibid.



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On 30 June 1958 Headquarters SAC still awaited presidential authority for sealed pit weapon maneuver.

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Crashes. On 13 March 1958 two B-47s were lost resulting in the deaths of five crew members. A B-47B of the 379th Bomb Wing, Homestead AFB, Florida, was observed to break up in flight after a normal takeoff. Examination of the wreckage revealed that the airplane had broken into four major components prior to impact: left wing, right wing, forward fuselage, and aft fuselage. All four crew members died in the crash. The accident investigation board determined the primary cause of the accident was structural failure. Disintegration of the airplane occurred because of failure of the wing center section just inboard of the buttock line 45 splice plates at approximately buttock line 35, left wing.⁹⁶ In another accident at McConnell AFB, Kansas a TB-47B assigned to the 3520th Combat Crew Training Wing, Air Training Command (ATC) disintegrated in flight, scattering parts over a wide area around the city of Tulsa, Oklahoma. Two crew members bailed out successfully, one failed to eject and was fatally injured. The conclusion of the board investigating the accident was that the primary cause of the crash was failure of the bottom skin plates of the left wing at leftbutt line 35. The crack

96. History of 379th Bomb Wing, Mar 1958, pp 17-18, filed in OIH, Hq SAC.

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or cracks existing in the aft plate of the lower wing skin at left butt line 35 at the time of the fatal flight were contributing causes of the accident.⁹⁷

Eight days following the twin accidents another B-47 was lost. This airplane, belonging to the 306th Bomb Wing was flying a low level "Pop-Up" mission over Avon Park Bombing Range, Florida, when it disintegrated during a pull-up. Four crew members died. Although the accident was ruled pilot error, because the pilot physically induced positive forces on the aircraft which in combination with other forces exceeded the structural limits of the aircraft, it was significant that the failure occurred at the right wing center box section. The crew was one of the best qualified in the entire wing to perform low level maneuvers.⁹⁸