DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY BOARD
WASHINGTON, D.C. 20314

DDESB-KT   27 January 1976

SUBJECT: Approval of Oval Steel Arch Magazine

SEE DISTRIBUTION

1. In the period 1972-1974, the Office, Chief of Engineers, Department of the Army contracted for and supervised the design of a new earth-covered structure for the storage of ammunition. The Department of Defense Explosives Safety Board participated in this activity, designing and sponsoring the execution of explosion tests of a full-size prototype of the structure at the Naval Weapons Center, China Lake, California. The structure is built of a corrugated steel arch having a noncircular cross section, with a single-leaf sliding door mounted on a reinforced concrete headwall.

2. The tests, known by the acronym ESKIMO, have demonstrated the safety of the oval arch magazine for ammunition storage at the minimum separations allowed by quantity-distance standards for side-to-side orientations and for certain permissible headwall exposures. Results of the tests are documented in unclassified technical reports covering the ESKIMO series. The oval arch magazine as finally designed is described by OCE Standard Drawing 33-15-73 issued in February 1975.

3. In view of its successful performance in tests, the oval arch magazine is satisfactory for the storage of ammunition containing quantities of explosive totaling up to 500,000 lb, at the minimum separation distances in various orientations permitted for standard, earth-covered, arch-type magazines by Table 5-3.4 of DoD 5154.4S, "Ammunition and Explosives Safety Standards," July 1974, with Interim Change 1-1 dated 26 November 1975. It is being included with other magazines listed as standard in paragraph 3-4 of DoD 5154.4S, Change 1 of which is in press. Use of this oval arch magazine for the storage of all types of ammunition should be considered because of its proven safety, favorable cross-section for unitized loads of rectangular shape, and relative construction economy.

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