

HISTORY

The history of the MIL-HDBK-5 Handbook and the ANC-5 Bulletin has not previously been chronicled. Therefore, an effort has been made to record the past history of these documents. Historical files were searched and the minutes of previous meetings and correspondence were reviewed in an effort to reconstruct previous events. However, early records were not diligently maintained, resulting in meager information in the years prior to 1948. Fortunately, the files did contain most of the revisions of the MIL-HDBK-5 and its predecessor. These revisions were most helpful in arranging the sequence of events. Although the history, which follows, may not be complete, it is believed that this description conveys a fairly accurate impression of the history of this Handbook. It is hoped that this history will prove interesting, especially for the young participants who have just recently become involved with the MIL-HDBK-5 program.

The predecessor to MIL-HDBK-5 was the ANC-5 Bulletin. This document was prepared by the ANC-5 Committee of the Army-Navy-Commerce Committee on Aircraft Requirements and issued by the latter. So far as could be determined, the initial issue of this Bulletin occurred in 1937. The 1938 version contained design information for columns, thin-walled sections, mechanical property design values for wood, steel alloys, aluminum alloys, as well as magnesium alloys, and design allowables for joints, fittings, and parts. Revisions of ANC-5 were published in October 1940, December 1942, and October 1943. After the 1943 revision, the activity of the ANC-5 Committee was discontinued because of World War II.

Apparently the next meeting of the ANC-5 Committee occurred on June 5, 1945, at the close of World War II. The function of the Army-Navy-Commerce Committee on Aircraft Design Criteria was amended on March 19, 1946, as follows: "To develop aircraft design criteria governing strength, detailed design, propulsion systems, equipment, flight characteristics, and performance of cargo, transport, and training

aircraft and to recommend the adoption of these criteria by the three member branches of the Government". The ANC-5 Committee attending the meeting on May 2, 1946, consisted of three members (two military and one civilian) from the Army (Air Material Command) and Navy (Bureau of Aeronautics), two members from Civil Aeronautics Administration (CAA), and a recorder from the military (USMC). The Chairman was Mr. E. I. Ryder, CAA. Five people from the Aluminum Company of America and Reynolds Metals also attended this meeting. The Chairman stated at this meeting that it would be desirable to have members of the aircraft industry present at the next meeting and to encourage industry participation in future revisions of ANC-5. It is interesting to note that the chapter on wood was deleted from ANC-5 in Amendment No. 2, August 8, 1946.

Mr. William T. Shuler, CAA, succeeded Mr. Ryder as Chairman in 1947. People from various government agencies, the aircraft industry, material suppliers, and fastener suppliers attended the ANC-5 Committee Meeting held on October 7, 1947, swelling attendance to 37. The ANC-5 Committee meetings were held alternately in Washington, D.C., and at Wright-Patterson Air Force Base (Dayton), Ohio. Generally, these meetings were scheduled in the Spring and Fall of the year. On September 21, 1948, the supervisory body for the ANC-5 Committee was changed to the Munitions Board Aircraft Committee. However, the function, operation, and membership of the ANC-5 Committee remained essentially unchanged. In September 1953, Mr. J. E. Dougherty, Jr., CAA, became Chairman. The Munitions Board was abolished in 1954, but the ANC-5 Committee continued to function as usual.

In 1954, Battelle Memorial Institute (Battelle) was awarded a contract by the Materials Laboratory, Wright-Patterson Air Force Base, Ohio, to review the field of material-property-design criteria for metals used in aircraft and missiles, and to bring up-to-date a compilation of design information for the design of aircraft and missiles. Over the next several

years, Battelle published seven Wright Air Development Center technical reports which contained design allowables and other pertinent information for incorporation into ANC-5. Since this initial contract, Battelle has continuously served as the Air Force contractor to maintain and update ANC-5 and MIL-HDBK-5.

In August 1956, the Air Force was assigned the responsibility for maintaining ANC-5. Mr. M. J. Crane, Aeronautical Standards Group (Navy and Air Force), was named Secretariat for the ANC-5 Committee on February 13, 1957.

In 1958 it was decided to publish the next revision as a military handbook. Battelle prepared the initial draft. Military Standardization Handbook MIL-HDBK-5, which superseded ANC-5, was published in March 1959. This revision incorporated the initial design information for titanium alloys.

Since the abolition of the Munitions Board in 1954, the ANC-5 and MIL-HDBK-5 Committees had been charterless. In 1959 effort was initiated to establish a Joint Committee of the Department of Defense and the Federal Aviation Agency on Federal Aircraft Design Criteria". This Joint Committee would have been the governing body for the MIL-HDBK-5 Committee. However, the establishment of this Joint Committee was not promulgated.

At the May 1959 MIL-HDBK-5 Committee Meeting, Mr. J. E. Dougherty, Jr., resigned and Mr. E. S. Newberger, FAA, was appointed Chairman. Mr. Newberger resigned in 1961 and Mr. D. A. Shinn, Aeronautical Systems Division (Air Force), became Acting Chairman for the November 1961 meeting. Mr. Dean Lauver, FAA, assumed Chairmanship and presided at the MIL-HDBK-5 Committee Meeting held in May 1962. Mr. Lauver's Chairmanship was short lived and Mr. D. A. Shinn, Air Force, became the new Chairman. He presided at the meeting held in November 1962. Battelle began preparing the revisions and change notices to MIL-HDBK-5 in 1964.

Messrs. Donald P. Moon and Walter S. Hyler prepared a report, AFML-TR-66-386, "MIL-HDBK-5 Guidelines for the Presentation of Data", dated February 1967. This report specified the analytical procedures and methods for presenting data for MIL-HDBK-5. Prior to that time, many different procedures had been used. Certain procedures had been adopted either formally or informally. In some instances, the techniques had been fairly well documented but were located variously in attachments to the minutes of previous MIL-HDBK-5 meetings, in statistical text and workbooks, in company reports, or in other miscellaneous publications. For this guideline report, procedures were written delineating these past practices. When necessary, analytical techniques were developed. These guidelines represented an important milestone in the utilization of standardized procedures for the analysis and presentation of data for MIL-HDBK-5. This report contained all of the required information for the analysis and presentation of data for MIL-HDBK-5 in one convenient source. All of the procedures contained in these guidelines had been previously approved by the MIL-HDBK-5 Committee. These guidelines were later incorporated into MIL-HDBK-5B, September 1971, as Chapter 9.

Beginning with the 39th MIL-HDBK-5 Meeting, April 1970, Battelle prepared and distributed the agenda and minutes of the MIL-HDBK-5 meetings. After about 10 years of consideration and discussion, guidelines for the analysis and presentation of fracture toughness data were approved at the 39th Meeting. These guidelines were incorporated into MIL-HDBK-5B, September, 1971.

At the 46th MIL-HDBK-5 Meeting, held in October 1973, Mr. D. A. Shinn announced that he was retiring from the Air Force and that he was stepping down as Chairman. Mr. C. L. Harmsworth, AFML (Air Force), succeeded Mr. Shinn as Chairman and presided at the 46th Meeting.

Battelle prepared a "soft" metric conversion of the first seven chapters of MIL-HDBK-5. This "soft" metric version of

MIL-HDBK-5 was published in an Air Force technical report, AFWAL-TR-80-4110, "Metrication of MIL-HDBK-5C", dated August 1980. Although this document was recognized to be limited in its usefulness, the primary benefit of this effort was the revelation of problems associated with the conversion to metric design values and the presentation of metric design data. The experience gained from this "soft" conversion will facilitate the preparation of a future metric version of MIL-HDBK-5 based upon a "hard" conversion.

Beginning with MIL-HDBK-5C, Change Notice 3, dated June 1981, the revisions of MIL-HDBK-5 were typeset at Battelle, rather than by the Naval Publications and Forms Center. This change was made to shorten the processing time

required to publish MIL-HDBK-5 revisions.

Design information for the first product developed and marketed by a foreign supplier was incorporated into MIL-HDBK-5D via Change Notice 1, dated January 1, 1984. Design allowables for 7010-T73651 and -T7651 plate were added to the Handbook. These products were produced by Alcan Plate Limited, Birmingham, England. The material was fabricated and tested using metric units of measure. The metric mechanical property data were converted to English units for analysis and inclusion in MIL-HDBK-5.

A chronology of the various meetings, meeting places, dates, and ANC-5/MIL-HDBK-5 revisions are listed in Appendix C.