

ORDER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

1020.1A

12/13/84

SUBJ: TRANSITION TO THE METRIC SYSTEM

1. PURPOSE. This order sets forth policies, responsibilities, and guidance governing agency metric conversion activities. This order also implements and transmits as Appendix 1, Order DOT 1020.1B, Department of Transportation Transition to Metric System.
2. DISTRIBUTION. This order is distributed to the division level in Washington, regions, and centers, and a limited distribution to all field offices and facilities.
- * 3. CANCELLATION. Order 1020.1, Transition to the Metric System, dated July 7, 1978, is cancelled. *
4. BACKGROUND. Order DOT 1020.1B establishes Departmental policy and administrative procedures for orderly transition to the metric system. It also directs actions to be followed in the conversion process and requires the development of a phased plan of action for the orderly transition from the customary system to the metric system.
- * 5. ACTION. All headquarters offices and services should anticipate development of individual plans for transition to the metric system based upon guidance contained in Order DOT 1020.1B, DOT Transition to Metric System, and the annual planning guideline memorandum prepared by the DOT Metric Coordination Committee. Each plan should encompass transportation policy and planning activities where feasible and be consistent with operational, economical, technical, environmental, and safety considerations. Additional guidance may be expected from the Office of Aviation Policy and Plans regarding initiation of action on the development of a plan, format, and content. *
6. DEFINITION. The metric system of measurement is interpreted for all Federal Aviation Administration programs to mean the International System of Units (referred to as SI) as established by the General Conference of Weights and Measures in 1960 and as interpreted or modified for the United States by the Secretary of Commerce. (SI is derived from the French name "le Systeme International D'Unites.")
7. POLICY. The FAA policy on metric conversion is as follows:
 - a. FAA shall pursue and promote an orderly changeover to the metric system of measurement in accordance with Departmental policy and administrative procedures set forth in Order DOT 1020.1B.

b. Any program to be adopted by FAA for the use of metric units of measurement in aviation should be based on the SI and, except for internal programs not affecting the flying public, established in consultation with other government agencies and industry and with full public participation.

c. Development of implementation plans for the adoption of metric units of measurement which involve the installation of new equipment shall take into account any financial or operational incentives for change as well as the remaining service life of the equipment to be replaced.

* d. The impact of implementation on the safety of operations will be taken fully into account, and any metric conversion plan must be consistent with the safety considerations of the agency. No conversion shall be implemented until the operational impact is assessed so that there is no derogation from the present level of aviation safety. Full consideration shall be given to the need for synchronizing the conversion among all parties affected.

e. Ultimate conversion to the SI shall be geared to an established order of priorities so that a sufficient period of time will be available in which to seek solutions in the case of standards presenting difficulties.

f. In the meantime, FAA shall:

* (1) Continue to utilize customary English units where it is practical to do so, e.g., supply altimeter settings in inches of mercury.

(2) Show metric equivalents in its Aeronautical Information Publications where it is practical to do so.

(3) Continue to support the efforts of industry and the Convention on International Civil Aviation in standardizing the units of measurement and flight operations, filing Notices of Differences, where necessary for safety and economic reasons.

8. RESPONSIBILITIES.

* a. All offices and services shall designate a metric coordinator as a focal point of contact within that office or service on metric matters. An associate administrator may elect to designate one overall metric coordinator for their organization and/or have a consolidated metric transition plan in lieu of individual plans. The Office of Aviation Policy and Plans shall be advised of the name of the coordinator and any subsequent changes. These coordinators will provide a point of contact within their offices and services for discussion of metric conversion problems and dissemination of information. Periodic meetings of the coordinators will be scheduled.

* b. All offices and services shall:

(1) Develop individual transition plans (unless an associate administrator elects to have a consolidated plan) for transition to the metric system of measurement to be based on forthcoming guidance from the Office of Aviation Policy and Plans. The Systems Engineering Service shall prepare a consolidated transition plan for the staffs of the Associate Administrator for Development and Logistics, with the exception of the Advanced Automation Program Office. *

(2) Revise their plan at a future date upon receipt of instructions and guidance to:

(a) Be consistent with the DOT Metric Coordination Committee's planning guideline memorandum, which is to be prepared no later than January 15 of each year (subject to approval by the Assistant Secretary for Policy and International Affairs).

(b) Reflect changes in office or service planning strategy. In addition, the Office of Aviation Policy and Plans will maintain an awareness of changes in status of national metric conversion. Each office and service will then be notified of these changes so they can be reflected in their transition plan updates.

(3) Assess the impact of metric conversion of U.S. air transportation insofar as their areas and responsibilities are concerned; identify the technical, operational, and economic problems that will need to be examined before the civil aviation community can convert to metric; and evaluate the costs and benefits involved in such conversion.

(4) Identify training needs and personnel requiring such training and forward any requirements to the Office of Personnel and Training with adequate lead time to permit the training system to be responsive.

(5) Develop guidelines and standards for conversion to and use of the SI as applicable to their areas of responsibility.

(6) Identify and determine the budgetary implications/issues and funding resources required to implement the provisions of this order and include them in the Call for Agency Five-Year Program (Spring Preview) and the Annual Call for Estimates submissions to the Office of Budget.

(7) Assure the SI is considered in the procurement of all equipment, supplies, and services and particularly in the design of new Air Traffic Control Systems/Airborne Systems, and Navigation Systems and their components. The implementation of the SI in such design and procurement activity will be consistent with established and coordinated (i.e., ICAO, FAR, and ATC) procedures for operation, maintenance, and control of aircraft. Particular emphasis should be given to the following:

(a) Where there is a specific program requirement being developed on a cooperative basis with another nation using the SI system.

(b) Where industry has made significant progress in converting to the SI system and production facilities are available.

(c) Where transportation industry preparedness and service may be enhanced.

(d) Where circumstances offer a definite economic, operational, or other advantage.

c. The Office of Aviation Policy and Plans shall:

(1) Serve as FAA's focal point for coordinating metric activity and compliance with this order and ensuring that stated policy is implemented effectively.

(2) Provide for liaison and coordination with other government agencies and user/industry organizations on agency metric planning activities.

(3) Provide information and guidance on metric planning matters and be the central agency source of documentation relative to metric conversion.

(4) Monitor progress toward conversion to metric.

d. The Office of Personnel and Training, in coordination with the various offices and services, shall develop new training programs or modify existing ones (as needed) to assure personnel are properly trained in the use and application of the SI.

* e. The Acquisition and Materiel Service shall assure that the procurement of all equipment, supplies, and services in FAA contracts is in accordance with drawings and specifications prepared by requirements offices. The latter offices shall consider the inclusion of the SI system of measurement in the drawings and specifications. In addition, the Program Engineering and Maintenance Service shall conduct an in-depth analysis utilizing the results of a systemwide NAS Plan analysis of the impact or risk involved in metric conversion, or conversion to metric on specific systems to be procured. *

f. The Associate Administrator for Aviation Standards shall be responsible for providing a human factors program, as deemed appropriate, and for monitoring human factors studies undertaken by FAA, other government agencies, or industry to determine the impact that conversion to SI may have on operational safety.

g. The Aviation Standards National Field Office shall provide the coordinator responsible for managing the metric conversion activities of all offices reporting to the Associate Administrator for Aviation Standards (AVS). Responsibilities of the AVS metric coordinator include DEVELOPING COORDINATED AGENCY POSITIONS and replies on international or national standards and practices which concern air operations or airworthiness or pertain to the units of measurement set forth in appropriate ICAO Annexes, and participating in any human factors studies undertaken by the agency to support flight and ground operations. The AVS metric coordinator will insure complete coordination with the Associate Administrator for Air Traffic of any future proposed change to any standard or practice affecting any function of air traffic.

* h. The Systems Engineering Service in conjunction with the Program Engineering and Maintenance Service shall conduct an overall NAS Plan in-depth analysis (including an analysis of the human factors implications of metrication) to determine the impact or risk involved in metric conversion. *

9. SPECIAL RELATIONSHIPS.

a. DOT Metric Coordination Committee. The Office of Aviation Policy and Plans shall serve as the agency representative on the Departmental Metric Coordination Committee, which was established by the Secretary of Transportation on June 14, 1976. The Office of Aviation Policy and Plans also shall serve as the agency point of contact for coordination of the committee's activities with concerned offices and services. The DOT Metric Coordination Committee will prepare, not later than January 15 of each year, a planning guideline memorandum to provide implementation for the several metric conversion plans and submit it for the approval of the Assistant Secretary for Policy and International Affairs. The conversion plans of each operating element will be reviewed and, as necessary, revised to be consistent with the planning guideline memorandum prior to July 15 of each year.

b. Federal Metrication Working Group for Meteorological Services. The Requirements Branch (AAT-150) and the Airspace and Air Traffic Rules Branch (AAI-230) under the Associate Administrator for Air Traffic shall represent FAA on this working group and work directly with designated representatives of concerned offices and services to obtain input on the Metrication Plan for Meteorological Services.

c. Interagency Committee on Metric Policy (ICMP). FAA shall provide membership in the appropriate subcommittees of the ICMP Metrication Operating Committee which involves the responsibilities, operations, and interests of the agency. Such membership should consist of those scientific, technical, professional, managerial, or other specialists needed to accomplish the mission of the division and shall be provided through the Office of Aviation Policy and Plans, which serves as the agency point of contact for liaison with this committee. The nine approved subcommittees of the ICMP Metrication Operating Committee are:

- (1) Industrial Liaison.
- (2) Construction.
- (3) Procurement.
- (4) Transportation.
- (5) Legislation and Regulations.
- (6) Consumer Affairs.
- (7) Public Education and Training.
- (8) Employee Training.
- (9) Metric Practices and Preferred Units.

d. American National Metric Council (ANMC) Aerospace/User Sector Committees (ASC/USC). Representatives of the agency may participate in the metric efforts of the ASC, which is presently divided into four subsectors: Air Operations; Engineering; Parts, Materials and Processes; and Manufacturing Operations. Likewise, representatives may participate in the metric efforts of the User Sector Committee since it is involved in construction, including airports and terminal buildings. Representatives are free to exchange professional opinions and/or personal views on the matters being taken up by the committees. However, in the absence of an approved FAA metric conversion program, the agency is not committed to opinions and viewpoints expressed by such representatives. Any nominations for agency personnel to serve on the ASC or USC are to be provided through the Office of Aviation Policy and Plans.

10. GUIDELINES

a. Official interpretation and modification of the SI for the United States is set forth in the following:

- (1) FEDERAL REGISTER Notices 42 FR 56513 (October 26, 1977) and FR 8399-8400 (February 28, 1982).
- (2) The Standard for Metric Practice (ASTM E 380-82, February 26, 1982).
- (3) Standard Metric Practice (ANSI/IEEE-268 1982).
- (4) American National Metric Council Metric Editorial Guide, fourth edition (1984).
- (5) Preferred Metric Units for General Use by the Federal Government (Federal Standard 376A, May 5, 1983). This standard lists preferred metric units (SI units and units accepted for use with SI) recommended for use throughout the Federal Government.

(6) Report to the Congress by the Comptroller General, "Getting a Better Understanding of the Metric System--Implications if Adopted by the United States" (October 20, 1978).

b. It is anticipated that conversion to SI will be on a sequential basis with those units which will have the least impact on the aviation industry/ users being converted first.

c. Although the DOT order permits FAA to initiate proposals to change to the SI, such effort will be made on a systematic and timely basis so that FAA actions are in consonance with those of other government agencies and the needs of the aviation industry and users.

d. Conversion of specific units will be activated through the directives system in a timely fashion to assure that all offices and services will be adequately prepared for the coordinated transition by the date of the changeover.

e. In preparing the individual plans of action for metric conversion, it is particularly important to:

(1) Identify areas of responsibility that will be impacted by metric transition.

(2) Determine international and external responsibilities and relationships.

(3) Incorporate operational, economical, technical, environmental, and safety considerations.

(4) Assess the revisions to agency directives, regulations, requirements, and procedures documentation that would be necessary for metrication conversion as well as the length of time which would be required to achieve conversion.

(5) Be mindful that:

(a) Industry is to set the pace for changeover, and in cases where FAA proposes changes in areas where it has statutory responsibility, it must schedule modifications of its requirements and procedures to minimize costs to industry.

(b) Transition is to be evolutionary, involving new systems and facilities and not normally including the redesign and modification of existing systems.


Donald D. Engen
Administrator

Department of Transportation

Office of the Secretary

Washington, D.C.

1020.1A
Appendix 1
12/13/84

ORDER

DOT 1020.1B

7-3-80

SUBJECT: DEPARTMENT OF TRANSPORTATION TRANSITION TO METRIC SYSTEM

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1. PURPOSE. This Order establishes Departmental policy and administrative procedures for orderly transition to the metric system.
 2. CANCELLATION. DOT 1020.1A, DEPARTMENT OF TRANSPORTATION TRANSITION METRIC SYSTEM, of 9-19-78.
 3. DEFINITION. The metric system of measurement is interpreted for all Departmental programs to mean the International System of Units (SI) as established by the General Conferences on Weights and Measure since 1960 and as interpreted or modified for the United States by the Secretary of Commerce.
 4. REFERENCES.
 - a. Public Law 94-168, Metric Conversion Act of 1975, dated 12-23-75, which declares a national policy of coordinating the increasing use of the metric system in the United States and provides for the establishment of a United States Metric Board to coordinate the voluntary conversion to the metric system.
 - b. Federal Register, Vol. 41, No. 239, 10-26-77, Department of Commerce, Office of the Secretary, The Metric System of Measurement, which sets forth the Interpretation and Modification of the International System of Units for the United States.
 - c. ANSI/ASTM E 380-76; ANSI/IEEE Std 268-1976, Standard for Metric Practice, provides guidance on conversion from U.S. customary units of quantities in general use, use of symbols, and rules for rounding.
 - d. ANMC Metric Editorial Guide, 3rd Edition, published by the American National Metric Council provides writers, editors, and others with rules for presenting metric quantities in printed matter.

DISTRIBUTION: All Secretarial Offices
All Operating Administrations

DPI: Office of
Intermodal Transportation

- e. Federal Information Processing Standards Publication (FIPS Pub) 34, specifies the use of SI units for information processing system as that defined by paragraph 4c.

5. BACKGROUND.

- a. A system of measurement, designated the SI, is being adopted throughout the world. This system is a modern version of the meter, kilogram, second, ampere (MKSA) system generally referred to as the metric system of measurement. Definitions and standards for the SI system of measurement are published and controlled by the General Conference of Weights and Measures, an international treaty organization.
- b. The Department of Transportation (DOT) participated in the United States Metric Study which led to the issuance of A Metric America: A Decision Whose Time Has Come, Special Publication 345, dated 7-71, sponsored by the National Bureau of Standards, Department of Commerce. This study resulted in a recommendation to the Congress in 7-71 that the United States change to the SI system. As a result of this study, and other actions by industry, the Metric Conversion Act of 1975 (Public Law 94-168) was approved 12-23-75.

6. POLICY. It is the policy of the Department to pursue and promote an orderly changeover to the SI system.

- a. It is recognized that industry will set the pace for changeover. However, in those cases where Government has statutory responsibility, it may initiate proposed changes. The Department will schedule modifications of its requirements and procedures to minimize these costs to industry resulting from DOT's transition efforts, as appropriate.
- b. Transition to the SI system will be evolutionary (i.e., involving principally new systems and facilities) and will not normally include the redesign and modification of existing systems.
- c. The Department will develop and implement a plan of action for its orderly transition from the customary systems of units to the SI system based on individual plans of action developed

by each Secretarial Office and operating administration. The plan will encompass transportation policy and planning activities and will be consistent with operational, economical, technical, environmental, and safety considerations.

- d. The Department will implement and be guided by the actions of the Interagency Committee on Metric Policy and its metric conversion policy for Federal agencies.

7. RESPONSIBILITIES.

- a. The Assistant Secretary for Policy and International Affairs serves as the focal point for all Departmental activities associated with the Department's use and transition to the SI system through the DOT Metric Coordination Committee. The Assistant Secretary for Policy and International Affairs shall review and approve all actions associated with the Department's transition to the SI system, and will represent the Department on the Interagency Committee on Metric Policy (ICMP).
- b. The Assistant Secretary for Administration shall be consulted on all guidelines pertaining to the development of Department-wide management systems involving the transition to and/or use of SI units of measurement.
- c. Each Secretarial Office and operating administration will develop a phased plan of action for their orderly transition from the customary system to the SI system. Each plan should encompass transportation policy and planning activities where feasible and be consistent with operational, economical, technical, environmental, and safety considerations. The Secretarial Offices and operating administrations will provide copies of their respective plans to the DOT Metric Coordination Committee.
- d. The DOT Metric Coordination Committee will prepare not later than January 15 of each year a planning guideline memorandum to provide implementation for the several metric conversions plans and submit it for the approval of the Assistant Secretary for Policy and International Affairs. The conversion plans of each operating administration will be reviewed and, as necessary, revised to be consistent with the planning guideline memorandum prior to July 15 of each year.

8. ACTION.

- a. Each Secretarial Office and operating administration will develop guidelines and standards for conversion to and use of the SI system as applicable to their areas of responsibility.
- b. The Secretarial Offices and operating administration will cooperate with industry by making available to the industry their guidelines and standards for the use of the SI system of measurement.
- c. The SI system of measurement will be considered in the procurement of all equipment, supplies, and services, and particularly in the design of new transportation systems and their components. Particular emphasis will be in the following areas:
 - (1) Where there is a specific program requirement being developed on a cooperative basis with another nation using the SI system.
 - (2) Where industry has made significant progress in converting to the SI system and production facilities are available.
 - (3) Where transportation industry preparedness and service may be enhanced.
 - (4) Where circumstances offer a definite economic, operational, or other advantage.
- d. The conversion to the SI system will be dependent upon Departmental personnel gaining early familiarity with its application. Training in the use and application of the SI units should be provided by the Secretarial Offices and operating administrations to their appropriate personnel.
- e. Programming and budgeting actions will include those readily identifiable resources required to support the Department's effort in converting to use of the SI system of measurement. These actions will be identified and planned so that costs can be included on an orderly basis in succeeding budget cycles.

- f. As appropriate, representatives of DOT Secretarial Offices and operating administrations will participate in the development of national and international standards using the SI system of measurement to assure the maximum performance of the nation's transportation system. The Department will be guided by the provisions of Office of Management and Budget Circular No. A-119, "Federal Participation in the Development and use of Voluntary Standards", dated January 17, 1980.

FOR THE SECRETARY OF TRANSPORTATION:



Karen S. Lee
Deputy Assistant Secretary
for Administration