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P 3NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
METRICATION REPORT TO THE CONGRESS

February, 1989

BACKGROUND

NASA first established policies for the use of the metric system for technical reports in 1970 (NASA Policy Directive 2220.4) and for hardware systems development in 1979 (NASA Notice 8010). The document policy requires use of the metric system in scientific and technical publications, except where its use would clearly impede understanding. The systems policy requires consideration of the metric system in new system development activities to the extent that "such use is economic, and consistent with project needs and objectives as well as private sector capabilities."

The metric system is used extensively throughout the scientific disciplines in NASA programs, but commitment to use of the metric system as the basis for U.S. built hardware has been severely hampered by the lack of metrication progress in the U.S. aerospace industry. Although use of metric hardware in NASA programs has been largely limited to that provided by foreign participants, NASA does have experience with integrating and supporting metric hardware, particularly for the European Space Agency developed Spacelab.

1988 ACTIVITIES

The major NASA metrication activity of 1988 concerned the Space Station. Although the metric system was the baseline measurement system for preliminary design studies, solicitations for final design and development of the Space Station Freedom requested use of the inch-pound system because of concerns with cost impact and potential safety hazards. Under that policy, however use of the metric system would be permitted through waivers where its use was appropriate. Late in 1987, several Department of Defense decisions were made to increase commitment to the metric system, thereby broadening the potential base of metric involvement in U.S. industry. A re-evaluation of Space Station Freedom units of measure policy was, therefore, initiated in January 1988.

That study was conducted from April to June, 1988, involved all major program participants and built on a similar study conducted during the preliminary design phase two and one half years earlier. The principal product of the study was a set of design implementation guidelines that provided a consistent, practical basis for making and controlling design decisions involving units of measurement. The intent of those guidelines was to enable a transition from inch-pound conventions to metric usage with minimum program impact. Those guidelines were used as the common basis of the metrication impact studies. The results of those

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studies are now being evaluated, but have not yet been reviewed by senior management.

Throughout this year's metrication activity, there has been cooperation with the metrication program in the Department of Defense. The design implementation guidelines were shared with the Department of Defense and were adapted by the Strategic Defense Initiative Program for their own use. In turn the Department of Defense, Defense Quality and Standardization Office assisted NASA in evaluating the metric compatibility of Department of Defense standards cited in the top level specifications for the Space Station.

With regard to the requirement of the new law to "seek out ways to increase understanding of the metric system of measurement through educational information...", NASA continues to support metric education through development and dissemination of instructional materials and assistance to high school science programs throughout the country. A 1985 publication, "Space Mathematics" (EP-176) is still distributed and used in public schools and an older but still used guide to metric usage, "Metrics in Space" (EP-82-2), was reprinted by the Government Printing Office in 1987 to support continuing requests.

At the field center level, the Marshall Space Flight Center has continued its active support of metric education at the state level, participating in Governor of Alabama's Proclamation of Metric Week for the State of Alabama, at the local level, through support and participation in Metric Day - the 10th day of the 10th month) in the City of Huntsville, AL, and through exhibits and distribution of information at the Marshall Space Flight Center itself during Metric Week.

To remove barriers to metrication while a long term plan for transition is being developed, we are examining possible changes to the NASA Procurement regulations that could assure equal consideration to metric responses to procurement solicitations as long as performance and safety are not compromised. A priori disallowance of metric products would be permitted only where a specific determination of unsuitability was made.

NASA maintained an active role in government-wide metric planning and assessment activities, both by participation in the inter-agency Metric Operating Committee (also serving on the Executive Committee of that body), and by direct cooperation with the Department of Commerce, Office of Metric Programs, the Department of Defense and national metric organizations such as the American National Metric Council and the U.S. Metric Association that represent a vital link with the private sector.

#### 1989 PLANS

In direct response to the requirements of the Omnibus Trade and Competitiveness Act for assessing impact and planning for transition to use of the metric system, a Headquarters level planning group is being established. During 1989, the principal tasks of this group will be to consolidate and revise NASA policy for the use of the metric system, determine the potential scope and impact and transition requirements for programs now in the planning process and assess our ability to accomplish the transition by 1992. From this assessment, an integrated NASA Metric Transition Plan will be developed.

Two specific areas in which we believe early attention should be focussed are development of orientation and training programs for the professional staff and assessing the availability of aerospace quality metric parts, a major issue effecting the commitment of any program to use of the metric system.

Also, early in the year, a final decision will be made on use of the metric system for the Space Station program.