
Ad Hoc Committee Report

Metric Usage in Federal Printing

December 1992

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EXECUTIVE SUMMARY

Proposed Recommendations

• Metric Implementation Procedures and Actions

The Government Printing Office (GPO) should express the specifications in its contracts using metric and inch measurements. Although this is a soft conversion approach, it fosters the transition by acquainting printing staff (both Federal and private industry) with metric measurements. Furthermore, it alerts contractors of the possibility of future changes, thus affording them the opportunity to make necessary plans.

GPO should develop a User's Guide on metric conversion. The Guide should provide a conversion table reflecting typical printing products in inches and their equivalent metric dimensions. Specifically, the table should reflect the mathematical conversions (exact dimensional translation) between U.S. standard sizes and their metric equivalents; adaptive conversions (rounded metric measurements) of the U.S. standard sizes expressed in exact inch dimensions; and hard conversion (size substitution) illustrating the international metric standard sizes with their corresponding inch measurements.

Furthermore, the Guide should depict the process and arrangement of printing products cut from prime sheets. This would ensure the economical selection of products to avoid excessive paper waste.

• Metric Transition Planning

- **Policy Issues.** The Joint Committee on Printing (JCP) should remain informed of GPO's planned actions. Based on the advice of GPO, the JCP should address the broader policy issues affecting the conversion to metric sizes.
- **Government-wide Transition Plan.** The JCP should establish an on-going dialogue with the Interagency Council on Metric Policy (ICMP) to encourage the:
 - (1) development of an effective Government-wide transition plan, and
 - (2) issuance of guidelines consistent with Title 44 and the Government Printing and Binding Regulations.

• GSA Study of the Impact and Cost of the Paper-Size Conversion

GPO should encourage the JCP to request that the Administrator of the General Services Administration (GSA) conduct an in-depth study of:

- The impact of converting Federal records and documents to metric standard sizes, especially stationery, correspondence, envelopes, and photocopying.
- The administrative costs of the paper-size conversion including:
 - the current price structure for non-metric paper products, filing equipment, and paper handling machines and accessories to determine a baseline for purchasing equivalent metric materials.
 - an analysis of the long-term economic and efficiency consequences of standardization for both the Federal government and industry.
 - the cost to alleviate any encountered problems and GSA's plans for transition in those areas.

- **Private Sector Involvement/Initiatives**

GPO should conduct formal conferences with representatives of the printing and paper manufacturing industries. These conferences should address mutual concerns, convey transition planning activities, and foster cooperation.

- **Training**

GPO should take the lead in developing the content for training courses designed for agency printing and publishing officials. In addition, GPO should review metric conversion software packages to ensure printing and publishing concerns are addressed.

Background

The Metric Conversion Act of 1975, as amended by Section 5164 of the Omnibus Trade and Competitiveness Act, requires that Federal organizations use the metric system for procurements and business-related activities, unless it is not economically feasible. Executive Order 12770 required organizations to formulate metric transition plans to implement the statute.

Developments

The Government Printing Office (GPO) formulated a metric transition plan which considers a conversion to metric-sized paper and printing products. Since such a conversion would involve a change to the physical characteristics of paper products currently used by the Federal government and industry, GPO was asked to study the effects of the conversion.

Methodology

Surveys were conducted of Executive Branch Agencies and printing and paper manufacturing industries to determine the impact of metric conversion and possible transition timetables.

Scope

Survey questionnaires were sent to the Metric Executives of all member organizations of the Interagency Council on Metric Policy. This included all 14 Executive Branch Departments and the 24 independent agencies. In addition, letters were sent to approximately 10,500 GPO printing contractors requesting their views on the planned transition.

Conclusions

- **Transition Timetable** - The printing and paper manufacturing industries are currently not in a position to efficiently and economically provide metric-sized printed products. To do so, printing equipment (web/forms presses and smaller sheet-fed presses) would need to be replaced. Because much of the current equipment has significant useful life remaining, replacement is cost prohibitive. However, a soft conversion is possible because the physical dimensions of the products would not change.
- **Measurement-Sensitive Concerns** - More information is needed to analyze the measurement-sensitive concerns expressed by the organizations' printing and publishing functions.
- **Metric Implementation Procedures and Actions** - An organized approach is needed for the development of metric implementation procedures to ensure consistent actions among the Federal organizations and industry.
- **Impact on Related Records Management Activities** - The establishment of a dialogue with industry suppliers would be helpful to determine the best approach for ensuring consistent designs for printing and files accessories.

- **Administrative Costs of Paper-Size Conversion** - With the exception of web press and forms printing, the associated costs of the conversion do not seem to be prohibitive. As the Federal organizations coordinate and consolidate their metric product orders, availability should increase and bring prices into a more competitive range.
- **Agency Willingness to Procure Metric Printed Materials** - Since a majority of the organizations polled are amenable to buying metric-sized printed products, a coordinated procurement strategy would ensure optimum results.
- **Private Sector Involvement** - More communication is needed between the agencies and industry concerning metric conversion activities.
- **Exclusions/Waivers to Metric Usage** - Exclusions or waivers to metric usage in the agencies do not seem to be factors in the conversion.
- **Training** - It could be beneficial to have a metric training program developed that would be tailored to agency printing and publishing specialists.

GLOSSARY

Adaptive Conversion - This conversion method changes an item's magnitude in one measurement system to a reasonably equivalent magnitude in the other system. Above all, this process should result in conversions to magnitudes that are meaningful and practical in application. Judgments in this process are often subjective and may require the balance of competing interests, including magnitudes employed in international standards and practices in the same or similar areas of application. This conversion method is a step in the approach towards hard conversion.

Dual Units - This conversion method involves the simultaneous use of both inch-pound and metric item descriptions. Judgement is required for determining which measurement system will take the primary position in the item description.

Hard Conversion - This conversion method involves the substitution of different-sized items, i.e., an inch-pound standard size is replaced with an accepted metric standard size for a particular purpose. For example the U.S. 8.5" x 11" paper size is replaced by the metric standard size of A-4 which is actually 8.3" x 11.7". Hard conversion is usually done to conform to international practice, such as adopting an internationally recognized standard or convention to enhance trade and communication.

Hybrid Systems - This conversion method describes items or systems by mixing both inch-pound and hard metric specifications. For example, a photocopy machine described with its internal parts in metric dimensions and external attachments such as paper trays described in inch dimensions.

Inch-Pound System - This measurement system is the current U.S. system. It includes such commonly used units as inch, foot, yard, mile, pint, quart, etc.

Metric System - The "modernized" metric system of measurement is known as the International System of Units or SI (from the French "Le Systeme International d'Unites"), which is interpreted or modified for use in the United States by the Secretary of Commerce (55 FR 52242, Dec. 20, 1990).

Soft Conversion - This conversion method is used to obtain an **exact mathematical change** in measurement units only, without altering the item's magnitude. The metric equivalent to an inch-pound magnitude is determined by multiplying by the appropriate conversion factor. The result is then rounded in a manner that reflects the precision of the original inch-pound value. In exact mathematical conversion, the primary concern is the necessary degree of precision. The new values should have the same degree of precision as that of the value from which it was derived.

BACKGROUND

Omnibus Trade and Competitiveness Act of 1988

The "Trade Act" (Pub. L. 100-418, section 5164) amended the Metric Conversion Act of 1975 (Pub. L. 94-168) to declare the metric system to be the "preferred system of weights and measures for U.S. trade and commerce." Federal organizations are also now required to use the metric system in procurements, grants, and other business-related activities, by a date certain and to the extent economically possible by the end of fiscal year 1992. In addition, the statute identifies exceptions to metric usage where such use is impractical, or is likely to cause significant inefficiencies or loss of markets to U.S. firms, such as when foreign competitors are producing competing products in non-metric units.

The passage of the law was based on the following findings:

- "World trade is increasingly geared towards the metric system of measurement."
- "Industry in the United States is often at a competitive disadvantage when dealing in international markets because of its nonstandard measurement system, and is sometimes excluded when it is unable to deliver goods which are measured in metric terms."
- "The inherent simplicity of the metric system of measurement and standardization of weights and measures has led to major cost savings in certain industries that have converted to that system."
- "The Federal Government has a responsibility to develop procedures and techniques to assist industry, especially small business, as it voluntarily converts to the metric system of measurement."
- "The metric system of measurement can provide substantial advantages to the Federal Government in its own operations."

Executive Order 12770, Metric Usage in Federal Government Programs (July 25, 1991)

Executive Order 12770 establishes the executive branch policy for implementing the statutory language applying to the Federal government's metric conversion. The Order also assigns responsibility to the Department of Commerce for the direction and coordination of the overall conversion effort. Furthermore, it requires the executive branch departments and independent organizations to formulate metric transition plans, devise a review process for exceptions to metric usage, and designate a senior-level official as the Metric Executive.

DEVELOPMENTS

GPO Metric Transition Plan

In order to comply with the metric legislation and to support the Executive Order, the Government Printing Office prepared a Metric Transition Plan. It was issued as GPO Instruction 725.1B, GPO Metric Program, dated May 13, 1991. Included in the plan were GPO's milestones, tasks, and tentative accomplishment dates.

Ad Hoc Committee on Metric Usage

On March 10, 1992, a meeting was held at GPO to discuss the impact of a transition to metric sizes (Exhibit 1) on the Federal printing program. The meeting was attended by the Staff Director and several other members of the Congressional Joint Committee on Printing (JCP); representatives from the GPO; and numerous executive agency printing officers.

Many of the attendees raised significant questions concerning the conversion requirements and their impact. The contents of the meeting yielded many concerns, yet few resolutions. As a result, the following recommendations were offered:

- An ad hoc committee should be established to examine the issues raised at the meeting. The Federal Publishers Committee and the Interagency Council on Printing and Publishing Services were requested to nominate members to serve on the ad hoc committee.
- The GPO should contact printing contractors on their bidding lists to determine the industry's ability to respond to metric-sized printing requirements.

Proposed JCP Policy Statement on Metric Usage

On March 27, 1992, the first ad hoc committee meeting was convened by Michael F. DiMario, GPO's Director, Procurement Services and Metric Executive. Mr. DiMario stated the ad hoc committee's objective was to: "Develop the basis for a proposed policy statement to be issued by the JCP to provide guidance for metric usage in Federal publications in accordance with P.L. 100-418."

Metric Units in GPO Communications

On August 7, 1992, GPO issued Instruction 725.B, Using Metric and Equivalent Units in GPO Communications. This instruction announced the requirement that the metric system be adopted as the preferred measurement system and that it be used in all GPO written communications when reference is made to units of weights and measures.

GPO Notification to Printing Contractors of Federal Metric Conversion Plans

On August 7, 1992, the Public Printer wrote to all Federal printing contractors announcing GPO's anticipation of receiving orders for metric-sized publications, other printed material, and paper products. Included in the letter was a request for contractors' comments on the GPO's metric transition activities.

METHODOLOGY

This report is intended to assess the impact of metric conversion on Federal organizations and the printing and publishing industries.

Pursuant to the GPO directions to conduct a survey of the metric conversion impact on Federal organizations, the Ad Hoc Committee developed a metric usage questionnaire. This questionnaire was transmitted from the Public Printer to the organizations' Metric Executives. The Metric Executives were instructed to obtain the assistance and information from appropriate functional areas within their organizations.

In order to ensure that the organizations' printing and publishing functions were included in the preparation of the questionnaire, GPO issued a Circular Letter, entitled Notification of Metric Survey, to the organizations' Printing and Publishing Officials.

The results of the survey questionnaire have been compiled and analyzed in this report. The arrayed data appear in the report's "Findings" portion. This information directly contributed to the development of the "Conclusions" and "Recommendations" portions of the report.

Furthermore, the comments received from the Federal printing contractors (as requested from the Public Printer's August 7, 1992 letter) have been incorporated into the "Findings" portion of the report.

SCOPE

Survey questionnaires were sent to the Metric Executives of all member organizations of the Interagency Council on Metric Policy (ICMP) (Exhibit 2). This included all 14 Executive Branch departments and the 24 independent agencies. In addition two independent agencies not covered by the Trade Act were sent a copy of the survey. Of the 40 departments and agencies polled, 27 or 68% responded to the survey. They were:

DEPARTMENTS

Agriculture	Commerce
Defense	Energy
Interior	State
Transportation	Treasury
Veterans Affairs	

INDEPENDENT AGENCIES

Commodity Futures Trading Commission	Consumer Product Safety
Export-Import Bank	Federal Communications Commission
Federal Emergency Management Agency	Federal Maritime Commission
Federal Trade Commission Administration	General Services Administration
Interstate Commerce Commission	National Aeronautics and Space
Administration	
National Science Foundation	Nuclear Regulatory Commission
Smithsonian Institute	Office of Personnel Management
U.S. International Trade Commission	Office of Science and Technology Policy
U.S. Information Agency	Administrative Conference of the
National Archives and Records Administration	United States

Responses were not received from:

DEPARTMENTS

Education	Health and Human Services
Housing and Urban Development	Justice
Labor	

INDEPENDENT AGENCIES

Agency for International Development	Central Intelligence Agency
Environmental Protection Agency	Federal Reserve Board
Small Business Administration	Tennessee Valley Authority
U.S. Postal Service	Office of U.S. Trade Representative

In some cases, a department submitted more than one survey to represent the views of their subordinate operating units (bureaus, organizations, services, etc). Since the sizes of these organizations were significant, it was decided to equally weigh the responses of all reporting organizations. Accordingly, the number of responses for a given survey question averages to approximately 70 responses per question.

In addition, approximately 10,500 letters were sent to GPO printing contractors requesting comments on the Federal transition to metric standard paper sizes.

FINDINGS FROM THE METRIC SURVEY

Transition Plans

Publishing Milestones for Agency Metric Transition Plans

Executive Order 12770 requires that each agency formulate a metric transition plan to implement the provisions of the Metric Conversion Act. These plans were to contain firm dates for metric accomplishment milestones and specify initiatives to enhance cooperation with industry.

Concerning transition plan milestones applying to the agencies' printing and publishing functions, fourteen or 19% of the organizations reported that their plans' contained specific milestones and tasks. Sixty organizations (81%) reported there were no printing and publishing milestones identified in their plans.

Integration of Printing and Publishing Activities with Organizations' Overall Metric Transition Effort

The Executive Order requires that each agency designate a senior-level official as the Metric Executive. This Executive is responsible for implementing the metric policy and providing effective management oversight of the agency's metric program activities. Since many of the agency's transition efforts encompass cross-functional operations, effective intra-agency metric coordination is of paramount importance. Accordingly, it was necessary to determine the degree to which the agency's printing and publishing metric goals paralleled the agency's overall metric system implementation.

Thirty four organizations (47%) reported that their printing and publishing metric transition activities were not integrated with the overall metric program. Twenty eight organizations (39%) indicated that their metric efforts were coordinated. Eight organizations (11%) did not know the degree of metric coordination.

Interagency Coordination

The Executive Order also requires the agency's Metric Executive (and ultimately the agency's metric program) to act as a liaison with other government organizations. Thirty nine organizations (57%) said that their printing and publishing metric transition activities were not coordinated with those of other government organizations. Twenty organizations (29%) report that their agencies do coordinate their activities with other agencies. Nine organizations (13%) did not know if any coordination was taking place.

Designation of Metric Official Responsible for Agency Printing and Publishing Activities

Due to the breadth of printing and publishing activities throughout the government, information was needed to show the likelihood of a centralized organization being responsible for managing the agency's metric efforts as they relate to the printing and publishing functions. Accordingly, forty one organizations (60%) stated that their agency intends to designate an individual to coordinate the printing and publishing activities with the agency's overall metrication program. Twenty organizations (29%) reported that their agency has no such intention; whereas, six organizations (9%) did not know if such a designation would occur.

Remainder of Actions Needed for Organizations' Overall Transition Plan Implementation

In order for GPO to properly plan for a conversion to metric paper standards, it is important to determine the organizations' overall schedules for their transition plan implementation. To obtain this information, the organizations were asked to estimate the percentage of total work to be performed before their metric transition would be completed. This work would include, but not be limited to: related milestones, tasks, guidelines, publications, and information systems.

The organizations reported that the following percentages represent the amount of overall metric transition activity that remains to be done:

Less than 10%	4 organizations	(6%)
10% to 24%	5	(7%)
25% to 49%	5	(7%)
50% to 74%	12	(17%)
75% or more	45	(62%)
Don't know	1	(1%)

Measurement-Sensitive Concerns

A number of factors, such as existing laws, regulations, and directives, could have an affect on the organizations' metric transition. This could be due to requirements which specify quantities or measurements that are incompatible with metric units of measure (i.e., metric-sized paper standards) or would entail undue cost or administrative burden. Issues based on these concerns are referred to as measurement-sensitive concerns.

Thirty six of the organizations (57%) identified operational activities as the major area where measurement-sensitive concerns are anticipated. Other concerns identified were:

Federal Specifications and Standards	28 organizations	(44%)
Federal Regulations	17	(27%)
Federal Law(s)	9	(14%)
Oversight	5	(8%)

Six of the organizations (10%) reported that no measurement-sensitive concerns would be encountered.

Metric Implementation Procedures and Actions

Both the statute and Executive Order assigns each agency with the responsibility for developing procedures and techniques to assist industry as it voluntarily converts to the metric system.

Twenty seven organizations (47%) reported that new or revised printing and publishing regulations, specifications/standards, and publications were developed. Twenty four organizations (42%) stated that no procedures were developed or actions taken with respect to the metrication of the printing and publishing functions.

Impact on Related Records Management Activities

In order to properly plan for the metric transition, it is necessary to assess the impact of conversion on related records management activities. Accordingly, the organizations were asked to identify the activities that could be adversely affected by the change to metric-sized printing and publishing materials.

Sixty four organizations (80%) identified the printing activity as being the most significantly affected. This was followed by the activities of forms management (fifty seven organizations (71%)), photocopying (fifty six organizations (70%)), files management (forty four organizations (55%)), records storage (forty one organizations (51%)), and correspondence management (thirty nine organizations (49%)).

The other records management activities that would be affected (prioritized by number of responses) were directives management, mail management, warehousing, and library/archives activities.

- **Printing**

The press machinery in the U.S. commercial printing industry is tooled for the 8 1/2" x 11" paper size (or a slightly smaller size due to trimming, bleeding, and feeding adjustments).

Large publishing jobs for newspapers, magazines, and other similar publications are produced using web presses. In order to minimize paper waste, a 22 3/4" cut off cylinder is standard for web presses in the U.S. A larger cylinder circumference is needed to produce A4-sized documents. Since paper waste is often the major factor contributing to a low bid, most web presses would need to be replaced. The normal life cycle replacement period for web presses averages 10 years.

For the smaller printing jobs, sheet-fed presses are used. There is a widely held belief that the A4 paper change will not cause significant obstacles to sheet-fed printing operations since various-sized documents are already being produced. Only normal dimensional adjustments to the machinery will be required. There is potential for significant cost increases if the amount of paper waste is increased because of less than optimal cutting from prime sheets.

- **Directives Management**

Most agency directives systems use a loose-leaf filing arrangement to accommodate the dynamic nature of the system (i.e., revisions, supplements, obsolescence, etc.). Usually the paper sizes of the directives are 8 1/2" x 11" or 6" x 9". Costs for replacing these systems would be prohibitive unless the system was to be replaced for other reasons.

- **Correspondence Management**

A review of regulations applying to the size of correspondence revealed no prohibition to converting to the A4 size. A similar conversion effort was made in the late 1970's when the Federal government converted from 8" x 10 1/2" paper to the current 8 1/2" x 11" correspondence size. However, there does not seem to be a suitable metric-sized equivalent for the 8 1/2" x 14" legal-sized paper.

- **Forms Management**

The Standard Form 1 which provides a template for designing government forms uses dimensions on a 1/10" and 1/6" grid. This is the standard vertical and horizontal spacing. Until some guidelines are issued for metric forms design, the continued use of inches, points, and picas would probably be required.

- **Files Management**

- **File Folders**

The dimensions of the U.S. standard file folder has a length of 297 mm (approximately 11 3/4") and a width of 237 mm (approximately 9 1/2"). The length of the metric A4 paper almost exactly matches the length of the standard manila and kraft file folders. Consequently, there is no room for the lengthwise edges of the standard folder to provide any document protection. On the other hand, the width of the A4 paper is narrower than the 8 1/2" x 11" size; thus, document protection does not become a factor.

If the U.S. standard file folders are equipped with two-prong fasteners at the top of the folders, the normal two-hole punches push the paper approximately 10 mm (7/16") down the length of the file folder. Accordingly, the A4 paper will extend past the length of the folder. As a result, the A4 documents would be subject to damage if the file folders were inserted into filing equipment exactly designed for the U.S. standard file folders.

The National Archives and Records Administration estimates that 2% to 3% of all Federal records are determined to warrant permanent retention for historical research. All other records are disposable, some after a relatively short time, such as 1 to 3 years, and others after many years (4 to 30 years or even longer). In most

cases, the file folders used to store the disposable records are not re-used and are disposed of when the records are destroyed.

- Binders

The dimensions of normal 3-ring binders are approximately 290 mm (11 3/4") in length and 280 mm (11 1/4") in width. The length of the A4 paper causes a collective 7 mm (9/16") overhang from the lengthwise edges of the binder. In addition, the A4 paper size's 210 mm (8 1/3") width results in a gap of 80 mm (3 1/4") across the width of the binder. This paper void causes difficulty with turning pages within the binder.

• Records Storage

The National Archives and Records Administration's Office of Federal Records Centers prescribes the specifications for the sizes and consistencies of boxes stored at the centers. These specifications are based on the shelving arrangement and archival life of the documents. Due to the current filing arrangement of boxes stored at the Centers, the change to A-4 sized documents could have a significant negative impact on the centers' records accession planning and disposal operations.

• Library/Archives Activities

Most library/archives activities already accommodate a variety of documents with differing sizes.

Administrative Costs of the Paper-Size Conversion

Since the organizations must absorb metric conversion costs within their normal operating expenses, it is important to determine from the outset where significant related costs would accrue. The organizations reported the following products would cause the most expense:

- Copier Attachments- Fifty two organizations (69%)
- Envelopes- Fifty (67%)
- Office Furniture- Forty one (55%)
- Boxes/Cartons- Thirty five (47%)
- Shelving- Thirty (40%)

• Copier Attachments

The GPO conducted a survey of its headquarters photocopiers to determine if the equipment accommodates the metric A4 paper size. Results indicated that most copiers were already equipped to handle the conversion.

Based on conversations with representatives from Kodak and Xerox, the large majority of copiers have paper trays that allow adjustment to the A4 paper size. For the remainder, specific A4 trays can be added to the copiers for a cost ranging from \$50 to \$100.

• Envelopes

The operation of some envelope handling machines is dependent upon printed codes or other markings precisely located on the envelopes. The dimensions of such markings or codes and their relationship to the envelope edges must be consistently maintained. Accordingly, the metric specifications must exactly parallel the measurements currently used for printed items, such as: barcodes, optical marks, etc. The physical profile of a folded letter will change with the possibility that a fully stuffed mailing envelope may be thicker and shorter than the former size. This could render the envelope less flexible and vulnerable to machine processing jams.

GPO reports that it stocks 16 different sized envelopes in inventory. This number arithmetically progresses when these various envelope sizes are altered to accommo-

date bar coding and window mailers. Until extensive tests are conducted, it is uncertain whether the current window mailer envelopes will satisfy the requirements of all required address and scan line information after the A4 paper is folded and inserted. Otherwise, the metric-sized envelopes will need to be designed to accommodate the scanning parameters required for postal machine processing systems.

• Office Furniture

Discussions were conducted with the Federal Prison Industries' UNICOR to determine the impact of the paper size conversion on office desk and cabinet file drawers.

UNICOR foresees no significant problems in making the change. Drawer sizes are large enough to introduce metric-sized files and folders. However, additional notches (representing the A4 length) would need to be etched into the sides of the drawers. This would allow the bars that support hanging file folders to properly fit into the drawers.

• Boxes/Cartons and Pallets

The conversion to the metric standard paper sizes could have an impact on warehousing printed materials stored in boxes and cartons. Most warehouse areas and corresponding storage equipment has been designed for a standard pallet size (40" wide x 48" deep x 54" high). This size holds 63 cartons in a 9 "tie" stacking pattern that is seven layers high. The change to the metric standard paper size would cause the former carton size to change from approximately 11.5" x 17.75" to 12.2" x 17.35".

In order to maintain the integrity of the 63 cartons per pallet and not increase the number of pallets to warehouse, the 9 tie stacking pattern would need to be maintained. A "tight" 9 tie pattern would occupy an area of 41.75" x 48.8". This results in a 2/5" overhang on the 48" side and 7/8" overhang on the 40" side of the pallet. The overhang could reduce the clearance space when inserting or removing pallets for aisles and pallet racks.

- Shelving

Another potential problem area that was identified concerns the storage of A4 forms and publications on static and movable shelving. Normally, static shelving has modules that are 18" deep and 36" wide; whereas, the moveable shelving is 36" deep and 36" wide". The change to the metric-sized cartons (12.2" x 17.35") could cause a decrease in location (shelf) capacity from three boxes to two boxes for static shelving and from four boxes to three boxes for the movable shelving.

In the Omnibus Trade and Competitiveness Act, Congress found that the metric system could provide substantial advantages to the Federal government in its own operations. Toward that goal, the organizations were asked to gauge the extent that they anticipated metric-sized paper would increase or decrease their costs for printing, publishing, and other related activities.

Sixteen organizations (22%) indicated that the paper-size conversion would increase their printing/publishing costs. One organization (1%) felt that their costs would neither increase or decrease. One agency (1%) reported that they expect their costs to decrease. Fifty one organizations (69%) did not know how their costs would be affected.

Metric-Sized Photocopy Paper

A large portion of an agency's duplicating needs are satisfied through the use of photocopy machines. Consequently, the agency's were asked to determine if metric-sized photocopy machine paper would be ordered if GPO could provide it economically.

Forty one organizations (55%) reported that they favored ordering the metric paper; whereas, 30 organizations (41%) were opposed to the alternative. Three organizations (4%) did not know if the metric paper would be ordered.

For those organizations willing to order metric photocopy paper, forty one (88%) reported that metric-sized paper would be used for all of their photocopy needs.

Cost is one of the major factors affecting the organizations' decision to purchase metric-sized photocopy paper. As a result, the organizations were asked to estimate the largest price increase (percent of cost above current 8 1/2" x 11" paper prices) that they would find acceptable. Forty nine organizations (66%) stated that any increase would be unacceptable. Sixteen organizations (22%) felt that a 5% increase or less would be manageable. Nine organizations (12%) indicated that they would accept whatever prices resulted from the market demand.

Agency Willingness to Procure Metric Printed Materials

Before issuing a substantive Governmental metric policy concerning conversion to metric paper standards, it was necessary to obtain information on the organizations' willingness to purchase metric-sized printing and publishing materials. The following responses indicate this acceptability with the contingency that the materials are readily available.

YES	46 organizations	(61%)
NO	28	(37%)
DON'T KNOW	1	(1%)

For those organizations indicating that they would purchase metric-sized printing products, the majority reported that metric-sized paper would be used for all types of printing including: stationery, forms, publications, pamphlets, newsletters, directives, and administrative printing.

Private Sector Involvement

• Survey of Federal Organizations

The involvement of the commercial printing and paper manufacturing industries in the Federal government's transition efforts is vital for successful metric system implementation. Accordingly, the organizations were asked to rate the degree to which private sector's technical, business, and administrative practices would affect the agency's transition.

Thirty three organizations (42%) indicated that current industry practices would hinder the Federal government's metric transition. Twenty six organizations (33%) reported that they did not know how private sector practices would affect the transition. Eleven organizations (14%) stated that industry practices would facilitate the conversion. Twelve organizations (15%) were neutral on the subject.

• Survey of Printing Contractors

In order to ascertain the perception of the metric conversion on printing contractors, the Public Printer wrote to approximately 10,500 GPO vendors. The letter explained the statutory mandate and solicited comments from the contractors concerning the effects of the planned transition. Fifty responses (.5%) were received by the GPO.

Thirty four (68%) of the respondents were opposed to the conversion. Opposition centered around economic feasibility and the lack of operational capability (such as the dimensional restrictions present on U.S. web presses).

Conversely, 16 contractors (32%) expressed some type of support for the conversion. This support included total support, support with reservations, or support of soft conversion only. It should be noted that a soft conversion would cause no size change to the printed materials currently being produced.

The major issues and concerns expressed by the GPO vendors follows:

- Most web and forms presses used in the United States have been constructed to produce printed products based on the U.S. 8 1/2' x 11" standard. The printing area or cutoff on most of the presses makes it economically unfeasible to produce a metric A4 size. Although it seems to be a common belief that drums or rollers can simply be replaced to change the cutoff size and/or impression area, a new press would be required to accommodate the change.

For example: the Internal Revenue Service proffered requisitions for two tax information publications requiring the A4 size on newsprint. This was a test case to ascertain the capabilities of web press printers to economically produce large-run A4 printing jobs. The first 12-page publication had a quantity of 1.4 million copies; whereas the second 8-page document required .9 million copies. Bids received for both of the publications averaged 30% higher than the cost of similar runs printed in the 8 1/2" x 11" size.

- For the sheet fed presses, medium and large presses should have little difficulty producing metric sizes. However, production time on many small presses would double. For example, on an 11" x 17" press, each trip through the press will produce only one metric A4 sheet, as opposed to two 8 1/2" x 11" sheets; on a 17" x 22" press, each cycle will produce four 8 1/2" x 11" sheets, but only two A4 sheets. As a result, production time for the A4 would be twice that of the 8 1/2" x 11" size. Similar problems exist on other size sheet fed presses.
- If a partial hard conversion would include products such as A4 cut-sheet forms, manufactured on existing sheet-fed presses that accommodate metric sizes, the product cost increase could be unjustifiable.
- The replacement of presses (web, forms, and small sheet-fed) is expensive. Many of the presses in operation still have extended periods of useful life remaining. Under current economic conditions, the acquisition of new presses is cost prohibitive and would cause an undue financial burden.
- Soft conversion could begin immediately, and standard inch-pound sizes should be translated to the metric system.
- For the immediate future, only products which can be efficiently and economically produced in metric sizes should be a part of the hard conversion.

Agency Initiatives with the Private Sector

One of the major provisions of the Executive Order requires that organizations undertake initiatives to enhance cooperation with industry, especially small business, as it voluntarily converts to the metric system. The following represents the types of agency activities that are planned or are being undertaken with the private sector:

Notified industry representatives/ vendors to determine their metrication status	11 organizations	(17%)
Recommended language in procurement documentation	10	(15%)
Disseminated educational materials	8	(12%)
Assisted small business with metric issues	6	(9%)
Meetings with private sector	5	(8%)
Meetings with industry associations	4	(6%)
No activities planned or undertaken	42	(64%)

Exclusions/Waivers to Metric Usage

The Executive Order requires organizations to establish an effective process for a policy-level and program-level review of proposed exceptions to metric usage. As a result, the organizations were asked to identify any printing/publishing-related procurements, grants, or other business-related activities that have been or could be excluded from the metric paper-size conversion.

Seven organizations (10%) identified exclusions for some of their printing/publishing-related procurements, grants, and other business-related activities. On the other hand, 28 organizations (41%) could not identify any waivers or exclusions. Fourteen organizations (20%) were not sure if any of these activities would be excluded or waived.

Training

Another tenet of the Executive Order requires that organizations take specific steps with associated schedules to increase understanding of the metric system of measurement through educational information and guidance and in Government publications. Accordingly, the organizations were asked to describe any training activities that were provided for the printing and publishing activities.

Twenty eight organizations (44%) have not provided any education or training to their employees. Twenty one organizations (33%) disseminated informational material on the statute, Executive Order, paper size conversion, etc. Twenty one organizations (33%) provided other types of education. Thirteen organizations (20%) conducted internal or external training.

CONCLUSIONS

- **Metric Transition Planning** - The metric transition planning efforts related to the printing and publishing functions could be improved.
 - Most agencies do not have specific printing and publishing milestones in their metric transition plans.
 - Most agencies do not integrate their printing and publishing activities with their overall metric transition planning process.
 - Most agencies do not coordinate their printing and publishing metrication efforts with those of other Federal organizations.
 - Most agencies have not designated an official to be specifically responsible for their printing and publishing metrication activities.

- **Measurement-Sensitive Concerns** - More information is needed to determine the measurement-sensitive concerns expressed by the agencies' printing and publishing functions.

Most organizations expressed measurement-sensitive concerns for their operational activities. For these areas, the organizations foresee the metric paper-size conversion to be incompatible with some printing and publishing operations and ultimately result in additional costs and administrative burden. Although the references were not specifically cited, some organizations also identified measurement-sensitive concerns in the areas of Federal specifications, standards, and regulations.

- **Metric Implementation Procedures and Actions** - An organized approach is needed for the development of metric implementation procedures to ensure consistent actions among the agencies' printing and publishing functions.

Less than half of the organizations have developed procedures or taken action to implement metric conversion in their printing and publishing functions. The question of the capabilities and status of conversion in the industries could cause organizations to be reluctant to issue procedures for these functions.

Based on the input of the Federal organizations and affected industry components, GPO, through JCP, should standardize and widely disseminate metric implementation procedures and actions. Where appropriate for standardization and economy, the JCP guidance should be incorporated in their regulations. The Metrication Operating Committee should be apprised of the existence of the instructions issued.

- **Impact on Related Records Management Activities** - A dialogue with industry suppliers would be helpful to determine the best approach for ensuring consistent designs for printing and files accessories.

The conversion to metric-sized paper standards could have an exponential impact on related records management disciplines. The conversion would have a direct effect on the management of directives, correspondence, forms, files, mail, and records disposition. In addition, office furniture and warehousing would be affected. Before these related records management issues arise, the associated far-reaching ramifications of the paper-size conversion should be examined in detail.

- **Administrative Costs of Paper-Size Conversion** - With the exception of web press printing, the associated administrative costs of the conversion may not be prohibitive. As the Federal agencies coordinate their metric product orders, availability should increase and bring prices into a more competitive range.

Large printing jobs produced on web presses are uneconomical and are likely to remain uneconomical for some time in the future. However, inordinate costs for peripheral products, such as copier attachments, envelopes, office furniture, boxes/

pallets, shelving, and photocopy paper, may not be to be an insurmountable obstacle. Prices should decrease as demand increases.

- **Agency Willingness to Procure Metric Printed Materials** - Since the majority of the organizations are amenable to buying metric-sized printing products, a coordinated procurement strategy would ensure optimum benefits.

Those organizations in favor of purchasing metric products indicated that the metric size would be used for most stationery, forms, publications, and other administrative printing.

- **Private Sector Involvement**

- GPO contractors indicate that, for the near term, only a soft conversion is feasible. Because hard conversion will require new printing equipment, replacement costs are prohibitive.

While many of the vendors recognized that a hard conversion is desirable, it is not an economic reality for major segments of the printing industry in the near term. Since most printed products have only a minimal value added, printing is generally produced in or near the country where the product is to be distributed. In general, printers believe that changing to metric sizes would not open new printing markets that could justify the expenditures for new equipment.

Given the status of the printing industry and considering the useful life of current equipment, a hard conversion may only be feasible after a five-year soft conversion process. During this interim, hard metric sizes should only be used when the products can be produced in an efficient and economical fashion.

- More communication is needed between the organizations and their printing and publishing suppliers in industry concerning metric conversion activities.

Few organizations have provided information to their industry suppliers concerning their metrication planning and implementation efforts. An increased awareness is needed in the form of procurement documents, educational materials, and meetings with industry associations.

- **Exclusions/Waivers to Metric Usage** - Exclusions or waivers to metric usage in the printing and publishing functions does not seem to be a factor.

The majority of organizations did not foresee the need for exclusions or waivers to metric usage requirements as they relate to printing and publishing. However, some organizations expressed uncertainty on future exclusions for printing procurements.

- **Training** - It could be beneficial to have a metric training program developed that would be tailored to agency printing and publishing specialists.

Although training is needed for some of the organizations, the overall metric education seems satisfactory. The majority of organizations have provided some of their printing and publishing employees with metric training or have provided other types of educational information.

PROPOSED RECOMMENDATIONS

• **Metric Implementation Procedures and Actions**

GPO should express the specifications in its contracts using metric and inch measurements. Although a soft conversion approach, it fosters the transition by acquainting printing staff (both Federal and industry) with metric measurements. Furthermore, it alerts contractors of the possibility of future changes, thus affording them the opportunity to make necessary plans.

GPO should develop a User's Guide on metric conversion. The Guide should provide a conversion table reflecting typical printing products in inches and their equivalent metric dimensions. Specifically, the table should reflect the mathematical conversions (exact dimensional translation) between U.S. standard sizes and their metric equivalents; adaptive conversions (rounded metric measurements) of the U.S. standard sizes expressed in exact inch dimensions; and hard conversion (size substitution) illustrating the metric standard sizes with their corresponding inch measurements.

Furthermore, the Guide should depict the process and arrangement of printing products cut from prime sheets. This would ensure the economical selection of products to avoid excessive paper waste.

• **Metric Transition Planning**

- **Policy Issues.** The JCP should remain informed of GPO's planned actions. Based on the advice of GPO, the JCP should address the broader policy issues affecting the conversion to metric sizes.

- **Government-wide Transition Plan.** The JCP should establish an on-going dialogue with the Interagency Council on Metric Policy (ICMP) to encourage the:

- (1) development of an effective Government-wide transition plan, and
- (2) issuance of guidelines consistent with Title 44 and the Government Printing and Binding Regulations.

• **GSA Study of the Impact and Cost of the Paper-Size Conversion**

GPO should encourage the JCP to request that the Administrator of GSA conduct an in-depth study of:

- The impact of converting Federal records and documents to metric standard sizes, especially stationery, correspondence, envelopes, and photocopying.

- The administrative costs of the paper-size conversion including:

- the current price structure for non-metric paper products, filing equipment, and paper handling machines and accessories to determine a baseline for purchasing equivalent metric materials.
- an analysis of the long-term economic and efficiency consequences of standardization for both the Federal government and industry.
- the cost to alleviate any encountered problems and GSA's plans for transition in those areas.

• **Private Sector Involvement/Initiatives**

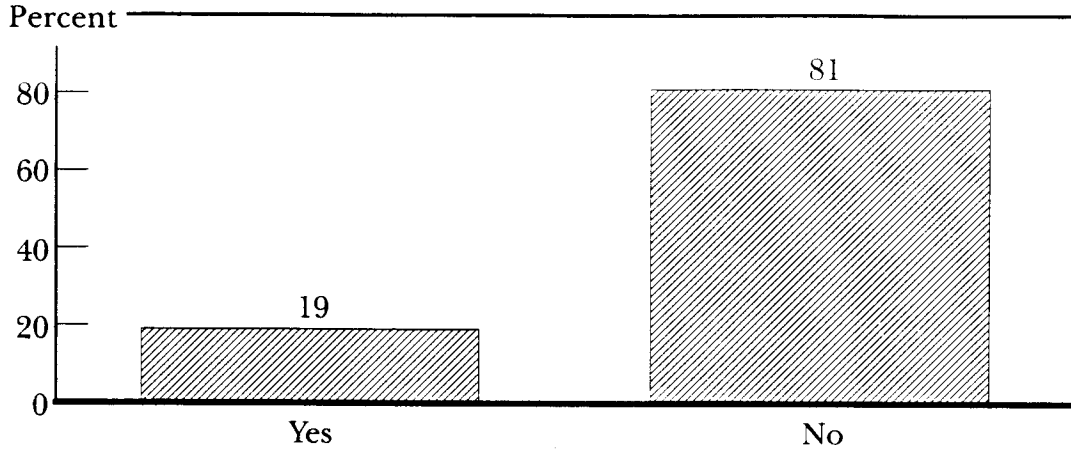
GPO should conduct formal conferences with representatives of the printing and paper manufacturing industries. These conferences should address mutual concerns, convey transition planning activities, and foster cooperation.

- **Training**

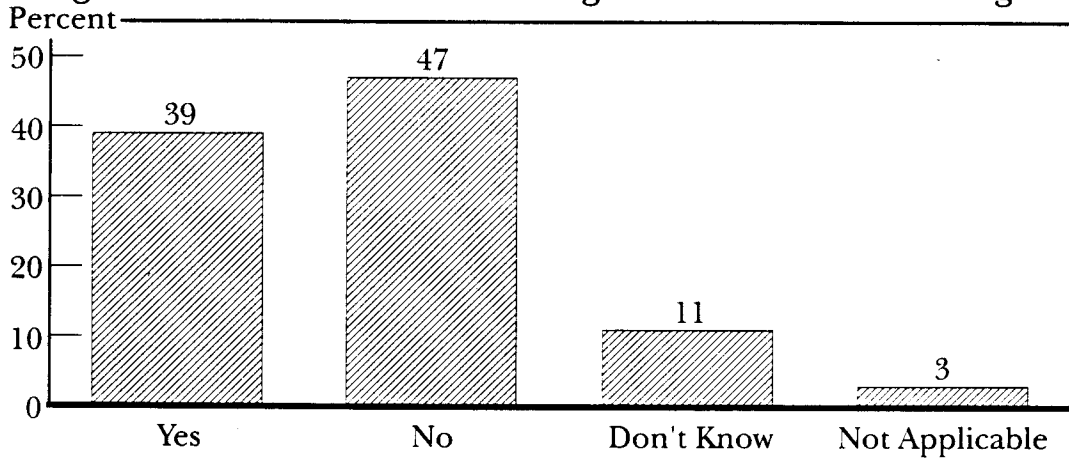
GPO should take the lead in developing the content for training courses designed for agency printing and publishing officials. In addition, GPO should review metric conversion software packages to ensure printing and publishing concerns are addressed.

Appendix

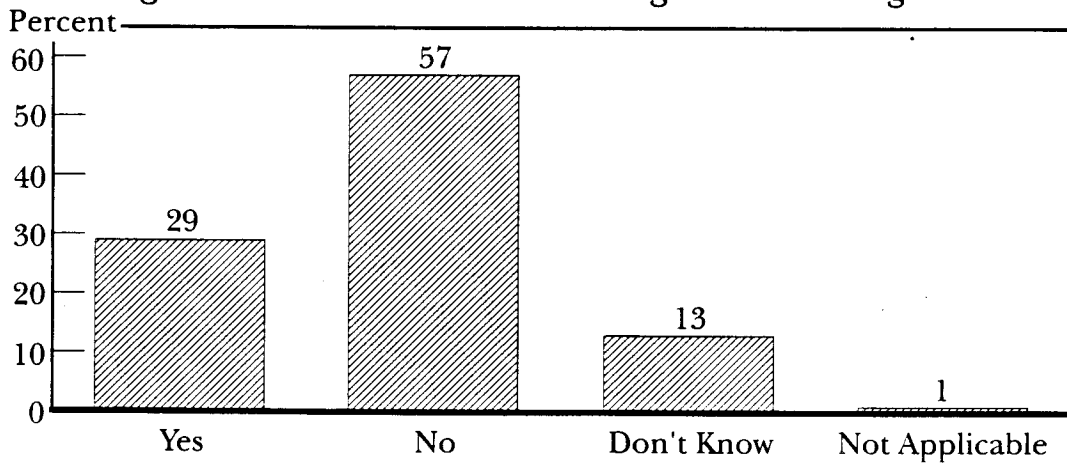
Agencies with Printing Milestones in Metric Transition Plan



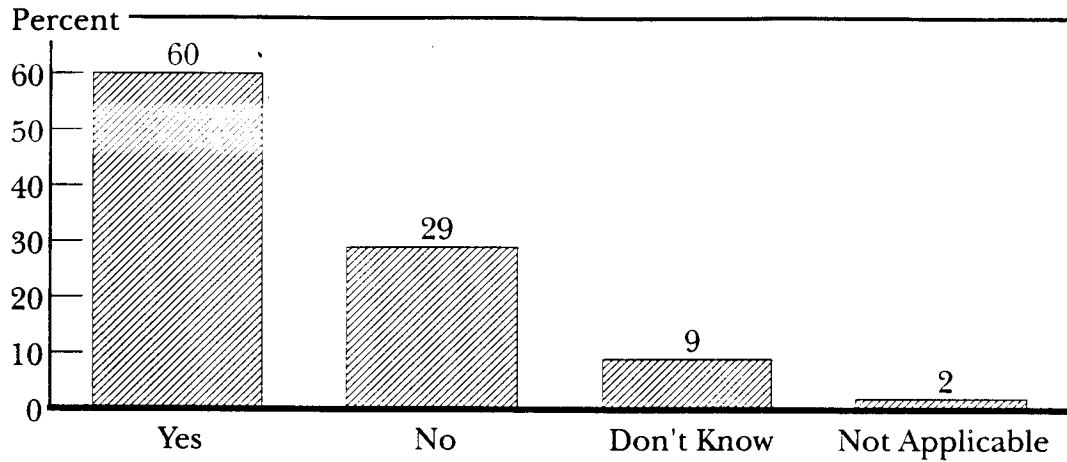
Agencies that Coordinate Printing with Overall Metric Program



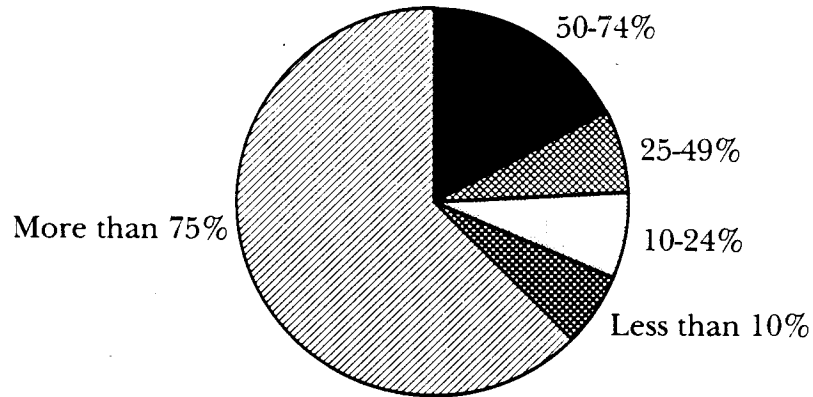
Agencies that Coordinate Printing with Other Agencies



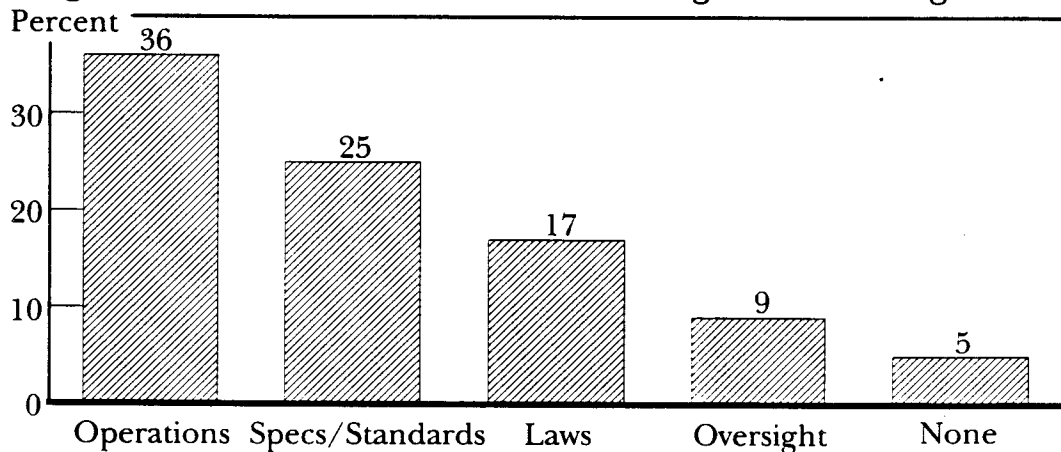
Agencies Intending to Designate a Metric Official for Printing



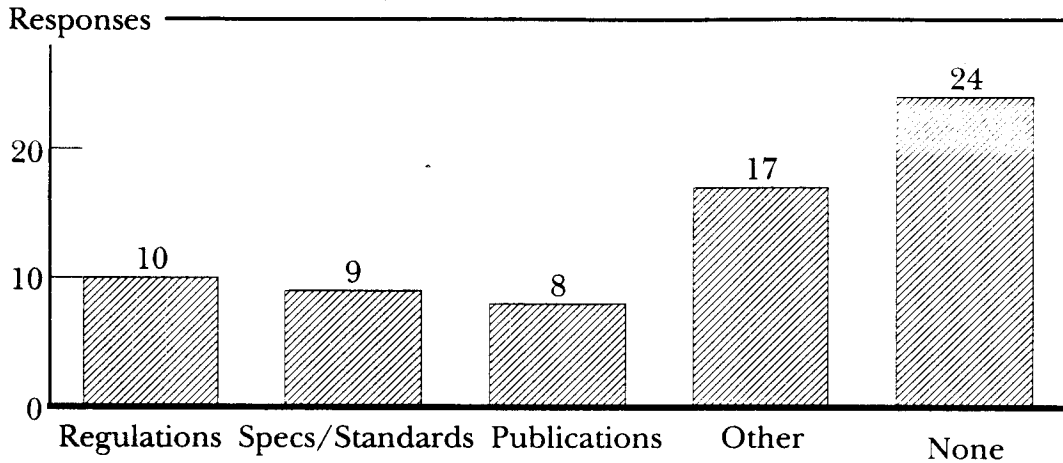
Amount of Metric Implementation Action Still to Be Done by Agencies



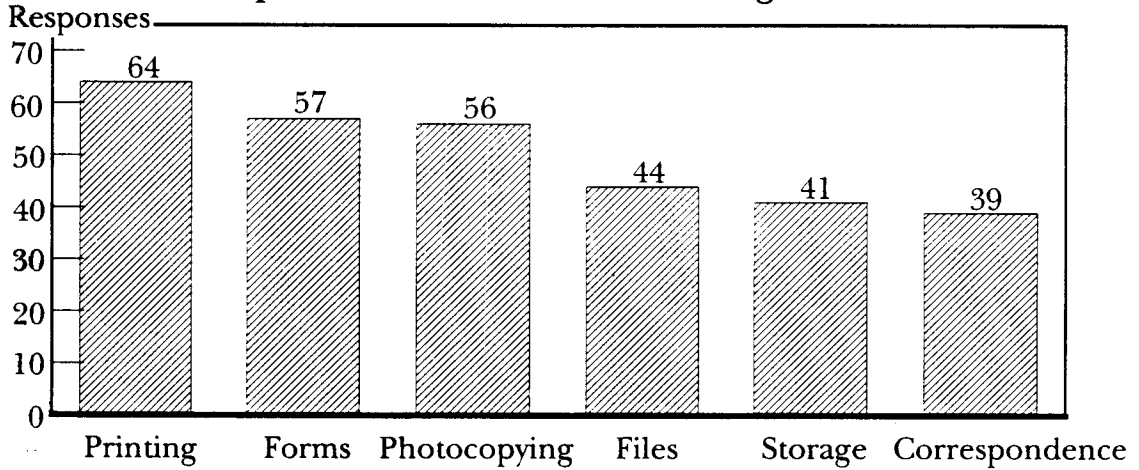
Agencies that Coordinate Metric Printing with Other Agencies



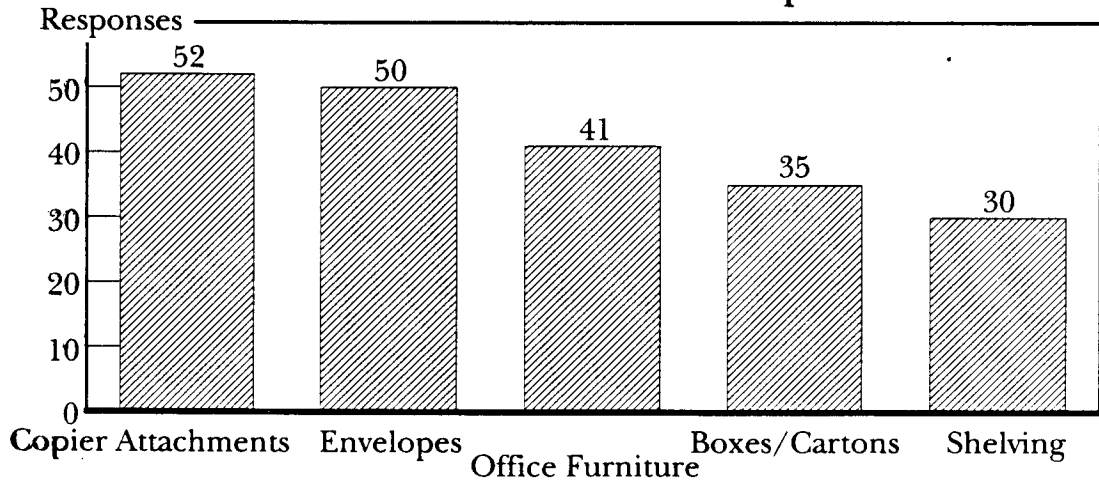
Types of Procedures or Actions Implemented by Agencies



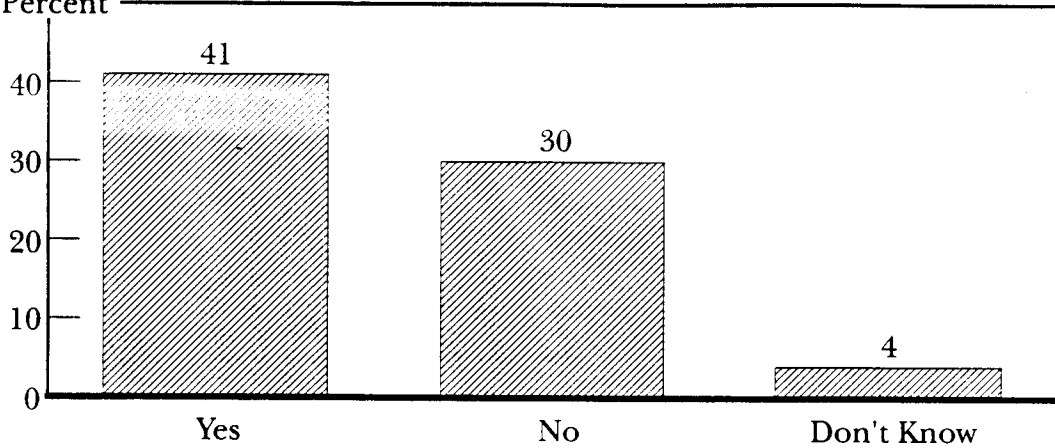
Adverse Impact on Related Records Management Activities



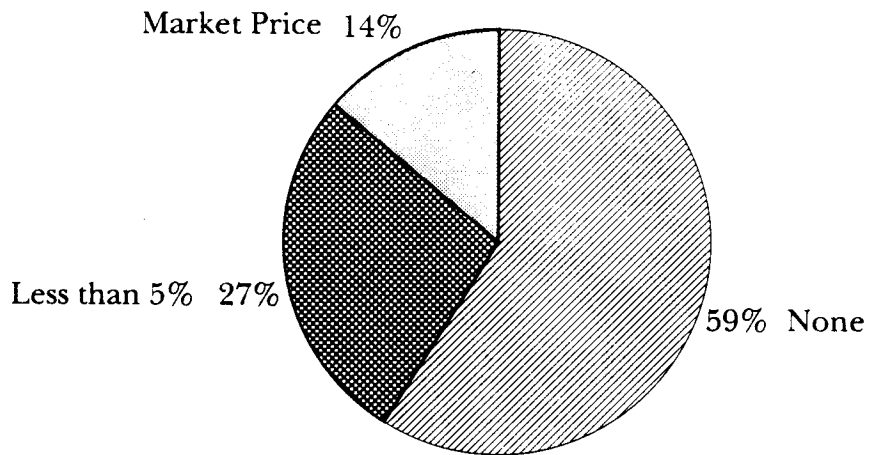
Areas of Potential Administrative Cost for Paper Size Conversion



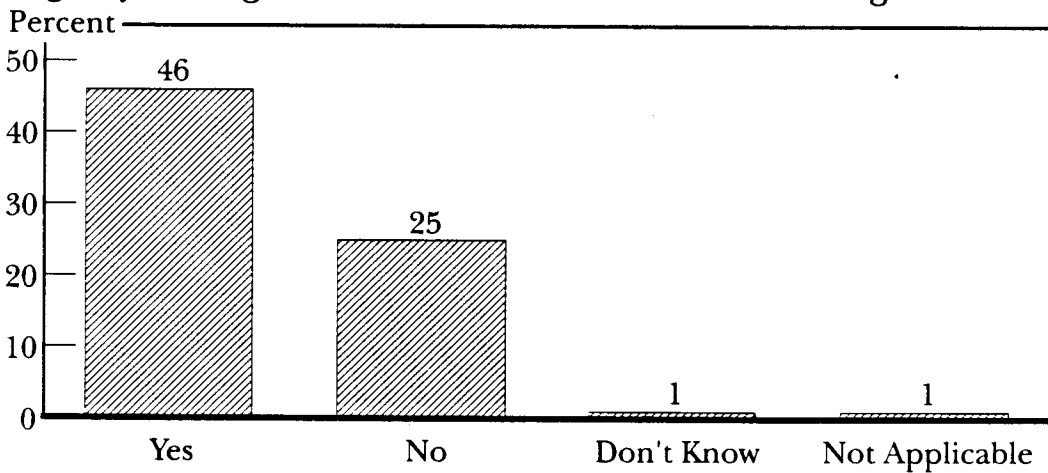
Agency Willingness to Purchase Metric-Sized Photocopy Paper
Percent



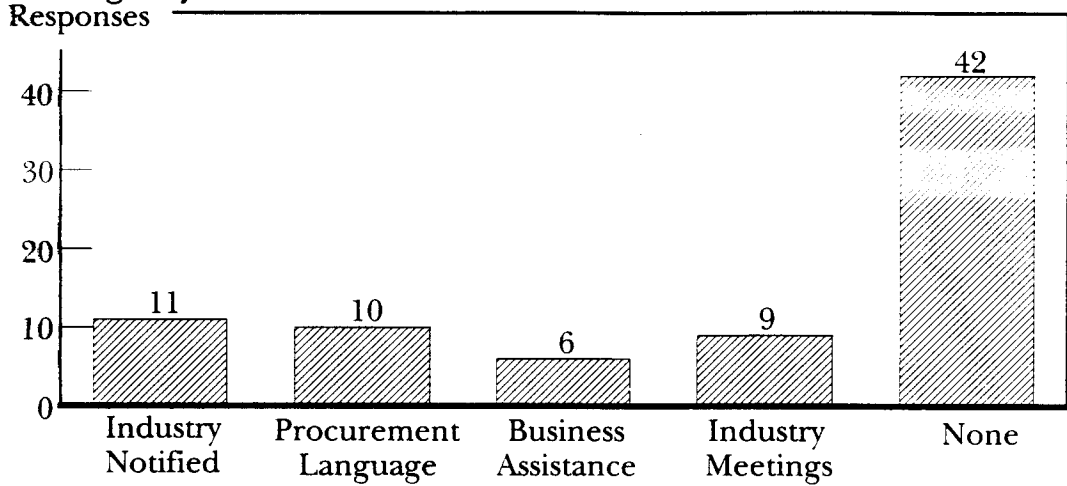
Acceptable Price Increase for Agency Photocopy Paper



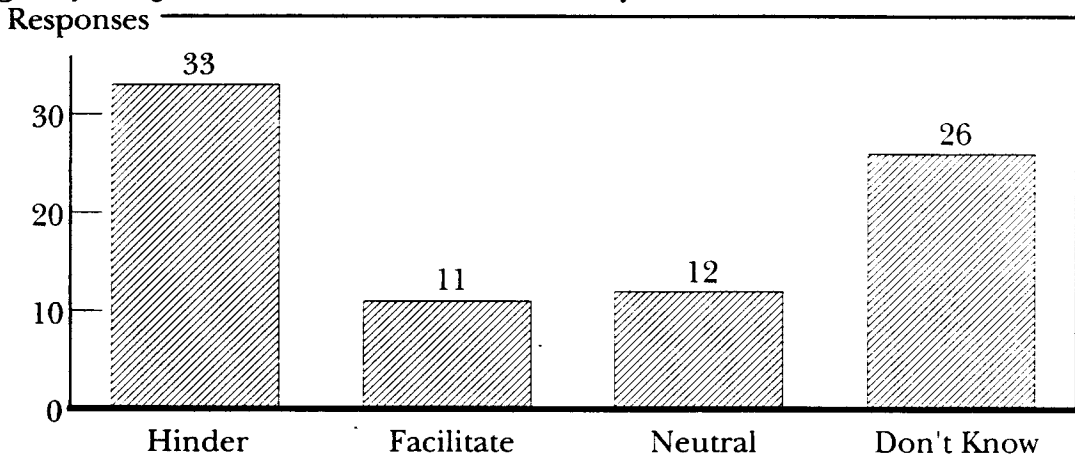
Agency Willingness to Purchase Metric-Sized Printing Materials



Agency Initiatives/Actions Taken With the Private Sector

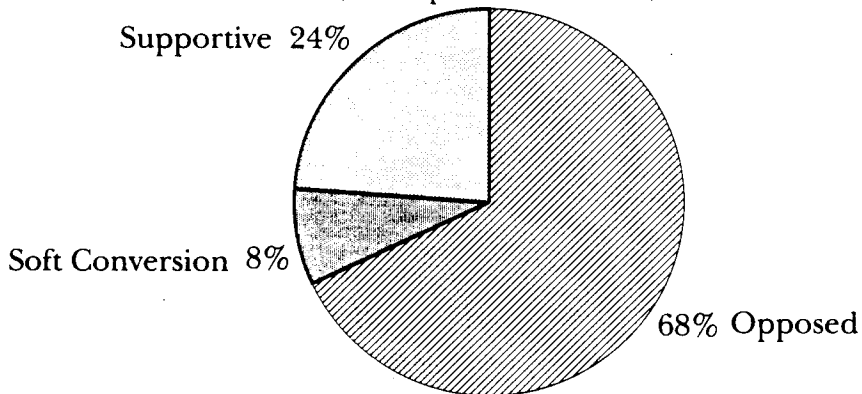


Agency Projections on Effect of Industry Practices on Metric Conversion

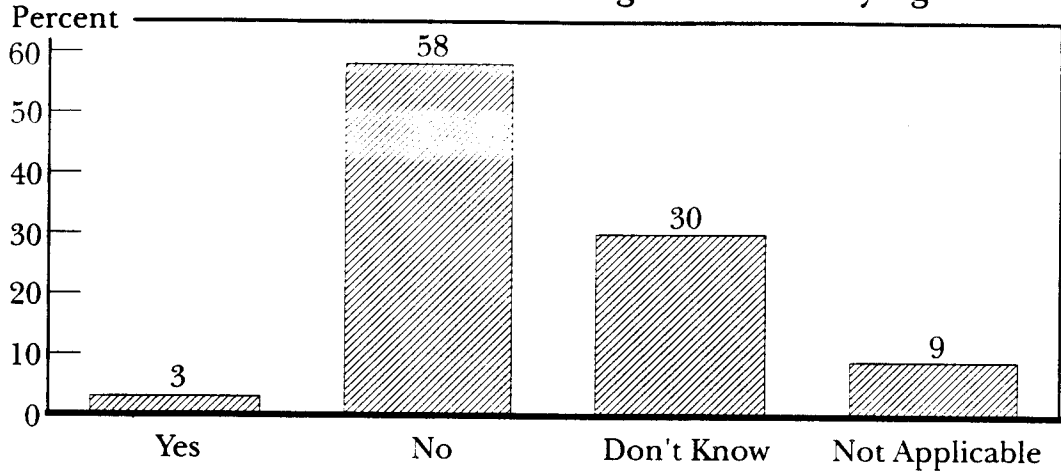


Industry Position on Conversion to Metric Paper Sizes

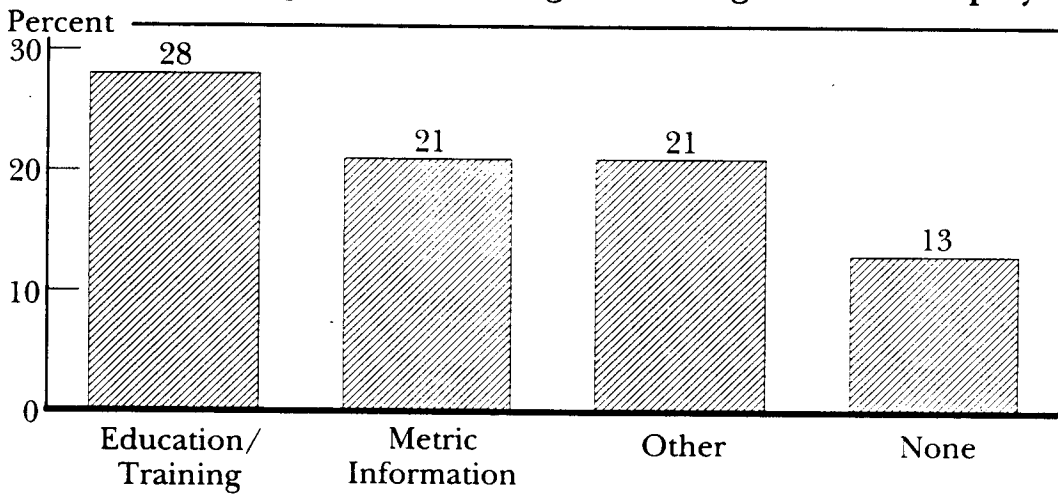
(50 responses received)



Exclusions/Waivers to Metric Usage Identified by Agencies



Agencies Providing Metric Training to Printing Function Employees



Ad Hoc Committee Participants

Representing the InterAgency Council on Printing and Publications Services

Hugh W. Kent, Internal Revenue Service
Thomas E. May, Department of the Treasury
Victor Trilling, Department of the Interior

Representing the Federal Publishers Committee

Gary Lauffer, Bureau of the Census
Warren Overman, National Institute of Standards and Technology
Daniel Rooney, Department of Commerce
John Weiner, Department of Energy

Additional Executive agency representatives

Roy Francis, Department of the Interior
Ray O'Brien, Internal Revenue Service

Representing the Government Printing Office

Charles Bermpohl
Burkey Boggs
James Joyner
Robert Saholsky
Robert Thomas