

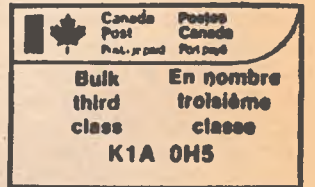
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Metric monitor

Vol. 7. No. 2

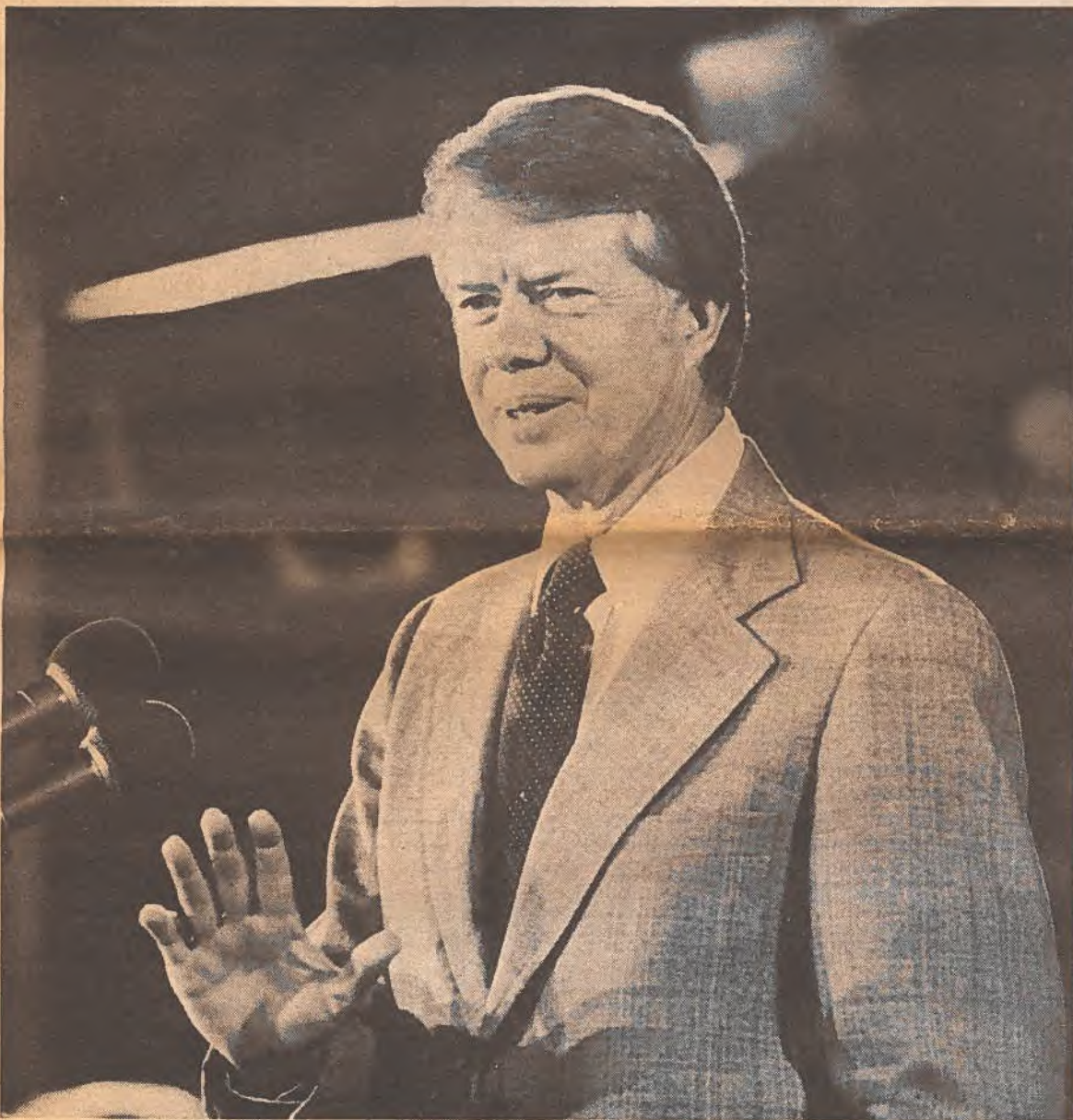
Metric Commission Canada

1980-03

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President Carter encourages metric conversion



Message from the President

The following statement was included in the report of the United States Metric Board to the United States Congress on 1980-03-17:

"I personally support and encourage the use of the International Metric System of Measurements in the United States. Conversion to

the metric system will help us to expand America's export markets.

With all the other industrialized nations of the world already using the metric system or soon to complete their conversion to metric, we will find ourselves at a serious disadvantage in selling

products to other countries if we do not make progress in our own conversion.

Because I believe metric conversion holds important long term benefits for our country, I am taking steps to encourage the use of this system in the private sector as well as in government."

US and Canada forestry sectors to meet in June

Some 28 Americans and Canadians from the forestry sector will visit Canada late in June on a seven-day tour organized jointly by Canadian Forestry Service, the Society of American Foresters and the American National Metric Council (ANMC) in order to give participants an insight into what Canadians are accomplishing with respect to the adoption of the metric system in forestry and to ensure that metric practices are compatible in North America.

This national tour will be an introduction to some of the most visible aspects of conversion in the

Canadian woods. It will feature federal and provincial government briefings (including an overview of metric conversion given at Metric Commission Canada headquarters in Ottawa), audio-visual presentations, and on-site demonstrations emphasizing the successful approaches to conversion with particular attention given to potential pitfalls.

Highlights will be an in-depth exposure to wood measurement (scaling) of trees, logging and inventory awareness in Québec, Saskatchewan and on Vancouver Island. Sector meetings are

scheduled to take place at the Pearson College of the Pacific near Victoria.

Among participants will be representatives from American universities and colleges, related industries, U.S. and Canadian governments and the American National Metric Council.

Tour organizer is 8.10 Sector Committee Chairman Rob Keen from Environment Canada's Canadian Forest Service. If anyone is interested in joining the tour, Mr. Keen may be contacted at P.O. Box 9702, Ottawa, Ontario K1G 3Z6, (613) 996-0811.

New Zealand completes conversion

Ian D. Stevenson, chairman of the New Zealand Metric Advisory Board announced late last year that the Board would disband 1979-12-31, having accomplished the objective for which it was set up. The office of the Board's secretariat closed on 1979-12-24 as well as the post office box.

Any matter concerning metric conversion is now the concern of the Department of Trade and Industry, Private Bay, Wellington, New Zealand, and the same applies to any question arising from outside New Zealand.

The Board chairman is available to the Department of Trade and Industry during 1980 for consultation.

The Board acknowledges that although the weighing and measuring equipment of the land, the education system, the thought processes of the rising generation, manufacturing and processing industries, farming and the market place are now all predominantly metric, nevertheless the adult population has still a long way to go in the matter of thinking spontaneously in metric units. Furthermore, this applies to many who are using metric units with facility in their work but not elsewhere.

New Zealand has made major strides in converting to SI since Ian Stevenson, chairman of the country's Metric Advisory Board sent the *Metric Reporter* an update on New Zealand's metric conversion progress in 1976. (See "New Zealand: Seven Year Metrication Goal to be realized", *MR*, 4-6, 8, '76). Stevenson's latest (and perhaps last) report was received by *MR* earlier this month. He writes:

The Metric Advisory Board of the 16 members set up by the (New Zealand) government first met in November 1969 and has had its last meeting in November 1979. The Board's terms of reference were "to encourage, advise and assist the progressive voluntary adoption of the metric system of weights and measures." There was no empowering legislation.

The Board established 14 sector committees to plan the conversion. These sector committees covered all the main groups in the economy, and each was chaired by a Board member. Committee membership numbered over 300.

Sectors:

Agriculture
Building and Construction
Central and Local Government
Education
Engineering and Engineering Servicing
Food and Consumer Goods and Services
Fuel and Power
Manufacturing and Processing
Public Relations
Recreation, Health and Sport
Science and Technology
Standardization
Transport and Communication
Weighing Machines

The role of the sector committees was to identify problems, prepare timetables and coordinate the metric conversion in their respective sectors of the economy. Where appropriate, divisional committees were established to operate in relation to specific areas within sectors. Wherever possible, sector committees and divisional

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EEC drinks metric

Here are the highlights of a European Economic Community directive on prepackaged liquids dated 1979-11-23.

This directive relates to the volume of certain prepackaged liquids such as wine, cider, beer, spirits, vinegar and vinegar substitutes, olive oils, milk and milk-based beverages, packaged waters, lemonade and fruit and vegetable juices.

The directive, published on 1979-12-04 in the *Official Journal of the European Communities*, amends a previous directive dated 1976-01-20.

It requires each of the several types of prepackaged liquids described above to be sold eventually in rationalized package sizes.

Some sizes will be "definitely allowed" and others only "temporarily allowed". Those that will be "definitely allowed" are, for the most part, in preferred numbers, and those that will be "temporarily allowed" are principally in oddball non-rationalized sizes.

Until 1983-12, the various types of prepackaged liquids mentioned above can be sold in any size (i.e. in "definitely allowed", "temporarily allowed", or other existing sizes).

On 1984-01-01, the various types of prepackaged liquids must be marketed in the "definitely allowed" sizes. However, if a member country of the EEC

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Former minister: Metric is here to stay

When the former Minister of State for Small Business and Industry, the Honourable Ron Huntington, issued a news release on metric conversion he announced the former Government's postponement of mandatory implementation in the retail food scale sector for a minimum of one year.

It is important to note that the majority of sector plans for metric conversion in Canada is voluntary and in announcing the postponement of the retail food scale plan Mr. Huntington has stated: "This decision obviously doesn't affect voluntary conversion programs."

Perhaps it is timely to reaffirm, as the Commissioners did at their 55th meeting 1980-01-09, that the facilitation and promotion of voluntary conversion have always been Metric Commission Canada (MCC) policy. At the first MCC meeting 1972-01-16, the Commissioners agreed unanimously that metric conversion should be planned by volunteers, and proceeded to send a letter-questionnaire to all national associations and provinces enlisting their cooperation.

This policy of planned but voluntary metric conversion was discussed again at the 41st meeting of MCC 1977-01-19. Some members of the textile industry were suggesting that regulations be

used to set a termination date for the use of the imperial system under the Weights and Measures Act administered by the Department of Consumer and Corporate Affairs. Although the use of such regulations was made legal by the Statute Law (Metric Conversion) Amendment Act 1976, MCC again confirmed its policy of voluntary metric conversion. MCC recommended against preemptive use of mandatory cut-off regulations and suggested their use only as a clean-up action in a marketplace already predominantly metric.

MCC's policy of planned implementation by voluntary consensus was confirmed again at the 45th meeting of MCC 1978-10-25. A renewed proposal sponsored by some members of the textiles and home furnishings industries and the Department of Consumer and Corporate Affairs for mandatory cut-off regulations was discussed. Only after extraordinary efforts by MCC staff and commissioners to determine that the market for textiles was predominantly metric, including special meetings at which those in opposition to the regulations were invited to speak out, did MCC agree to a legislation cut-off. A news release, dated 1979-03-21 on "Retailing of Home Furnishings", was authorized by

MCC at its 49th meeting on 1979-01-25.

This news release included the following statements:

"Metric Commission Canada has established planning methods and consensus building scheduling procedures for the review and approval of sector plans which are national in their scope and application. The sector committees staffed by volunteers and the planning methodology established by MCC offer the means of change — but no move has been initiated by MCC to coerce by legislative action. Previous legislative changes have been introduced by the government through Statute Law (Metric Conversion) Amendment Acts designed to facilitate metric conversion. These changes have been requested either by the voluntary sector committees concerned or, where initiated by government departments, have been reviewed and concurred in by the sectors concerned."

The conversion of highway speed and distance signs, for obvious reasons related to safety, was legislated by provincial governments. The decision to do so, however, was reached at a meet-

ing of the provincial ministers of highways in Nova Scotia in 1973, independently of MCC, and was only subsequently introduced into the road design and operations sector plan when the Roads and Transportation Association of Canada (RTAC) agreed to form the nucleus of the sector planning subcommittee. The plan, including its legislative provisions, was only approved by MCC on 1976-09-15.

The record clearly establishes that mandatory aspects have been introduced by various provincial and federal government departments, generally at the request of individual sector committees, but never at the request of MCC as an initiator. As already stated, this is not to deny that there are sectors where a legislated conversion is the only sensible or practicable course. In these cases, MCC has taken extraordinary measures during the scheduling phase to ensure consultation and a clear consensus amongst all those concerned.

This was the case with the Working Group on Scales in the Retail Food Industry (Sector 3.10) where volunteers representing both large and small companies in the Retail Council of Canada, the Canadian Federation of Retail

Grocers, the Retail Merchants Association, L'Association des détaillants en alimentation du Québec, the Canadian Grocery Distributors Institute, and the Consumers Association of Canada, as well as the scale manufacturing and repair industry, worked openly with the Department of Consumer and Corporate Affairs for five years to develop a carefully scheduled plan which from the beginning involved a consensus that the changeover would be regulated in the interests of all concerned. Regulations under the Weights and Measures Act were requested from the Department of Consumer and Corporate Affairs by the retail food industry unanimously and with the support of the Consumers Association of Canada.

Mr. Huntington, in his recent news release, emphasized that the postponement of metric conversion in the retail food sector provides time for a consultative review of the implementation process. Such a consultative review can be useful. You will recall that in his earlier news release the Minister of Small Business and Industry stated: "I am convinced that the present and future will demand that Canadians accept the fact metric is here to stay."

One metric system

The recognized international authority on measurement systems is the International Organization of Weights and Measures which was founded in Paris in 1875 as a result of the Treaty of the Metre. This body consists of the following organizations:

General Conference of Weights and Measures (CGPM)
International Committee of Weights and Measures (CIPM)
International Bureau of Weights and Measures (BIPM)
Consultative Committees (CCU).

The BIPM, which is located in Sèvres, France, is the full-time working body which maintains custody of measurement units and standards. Its permanent mission is to achieve uniformity of physical measurements throughout the world at the highest level of precision.

Decisions made by the BIPM rest with the CGPM which assembles the delegates of 43 nations at least once every six years. The CGPM has met 16 times since 1889, the date of the first conference.

In 1889 the first conference legalized the international prototype of the kilogram and declared that this prototype should henceforth be considered to be the unit of mass. This international prototype made of platinum-iridium is kept at the BIPM under conditions specified by the 1889 conference.

Also legalized by the first conference was the international platinum-iridium prototype of the metre.

In 1901, the third CGPM declared that the unit of volume, for high

accuracy determinations, was the volume occupied by a mass of one kilogram of pure water, at its maximum density and at standard atmospheric pressure; this volume is called "litre".

The participants also agreed that the kilogram was the unit of mass; it was equal to the mass of the international prototype of the kilogram.

The word "weight" denotes a quantity of the same nature as a force: the weight of a body is the product of its mass and the acceleration due to gravity. In particular,

the standard weight of a body is the product of its mass and the standard acceleration due to gravity.

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Survey results

Some 2000 *Monitor* readers completed and returned the questionnaire which was published in the October issue. The following highlights and percentages give a general idea of reader profile and preference:

- Percentage of respondents by category:
 - Industry — 38%
 - Government — 24%
 - Education — 23%
 - Business/Finance — 11%
- 55% of respondents were aged between 40-59.
- 90% of replies were from regular readers.
- 70% of respondents did not discard the *Monitor* after reading (filed, passed on, placed in reception area).
- 55% read the *Monitor* for both personal interest and work reasons.
- 60% of respondents were directly involved in metric conversion.
- 65% were satisfied with the proportion text/illustrations.
- 23% would like more text.
- 30% would like more illustrations.
- 90% think the *Monitor* is informative.
- 70% are satisfied with the coverage of technical aspects.
- 20% would like the technical aspects of conversion covered more fully.
- Type of content liked in order of preference:
 1. Industry & Sector News
 2. Education
 3. Specific Products
 4. Company Progress
 5. International Scene
 6. Human Interest
- A higher proportion of respondents who read the French version have jobs in education (36% education/24% industry) compared to respondents who read the English version (22% education/39% industry).
- 5% of regular readers thought the *Monitor* uninformative while 15% of occasional readers thought the same.

World wide move to SI

Various changes and improvements undergone by the metric system, in its evolution since the 18th century, have given some people the notion that each change identified a separate system. Others, unaware of names other than the International System of Units (SI) feel by implication that more metric systems must surely exist.

The International System of Units, recognized in the Weights and Measures Act of 1971, as "the" metric system is the latest embodiment of a continually improving system. It has evolved over almost two centuries along with the development of science and technology, and on the recognition of the interdependence of different disciplines.

The metric system was so named because it was based on the metre. Its development was recommended by the Constituent Assembly in France in 1789, and spurred on by a royal edict signed by Louis XVI at the beginning of the French Revolution. It was made truly international by the Treaty of the Metre in 1875, signed by seventeen nations including the United States and Great Britain; Canada signed this treaty in 1907. In time a sub-set of the metric system evolved into what has been referred to as the cgs (centimetre-gram-second) system which due to the small size of the units of length, mass, time was preferred by scientists.

For more practical purposes larger units were preferred and this sub-set of metre, kilogram and second came to be known as the mks system.

In 1901, Giovanni Giorgi, a professor at the University of Rome proposed that the metric system should be based on four rather

than three units, to cover the whole field of electrical, magnetic and mechanical phenomena, and this sub-set eventually became known as the mksa system (metre-kilogram-second-ampere).

The mksa system, which evolved to include six base units, (i.e. metre, kilogram, second, ampere, kelvin and candela) was approved in 1954 by the 10th General Conference of Weights and Measures. It was renamed the International System of Units (SI) in 1960.

This one and only metric system (SI), is defined and periodically improved by the General Conference of Weights and Measures, evolving and improving to keep pace with improved techniques in science, technology and meteorology.

The adoption of seven universally agreed base units, and two supplementary units has resulted in a coherent metric measurement system (SI) consisting of the seven base units in the accompanying table. All other units required for whatever purpose can be derived from these and the two supplementary units by simple multiplication or division and without recourse to any numerical conversion factors.

Name of Unit	Symbol	Quantity
metre	m	length
kilogram	kg	mass
second	s	time
ampere	A	electrical current
kelvin	K	thermodynamic temperature
mole	mol	amount of substance
candela	cd	luminous intensity

Information from:
THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES
Published 1875-1975 (ref. 113)
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American National Metric Council Reports Progress

Here are excerpts from the remarks made by Roy P. Trowbridge, member of the Board of Directors of the American National Metric Council, at the U.S. House of Representatives sub-committee on Science, Research and Technology oversight hearing on the U.S. Metric Board on 1979-11-26. Mr. Trowbridge is also director of the engineering standards section at General Motors. His association with both these organizations, the non-profit ANMC and the for-profit GM, has given Mr. Trowbridge a good vantage point from which to make some observations regarding metric conversion in the United States.

ANMC

The American National Metric Council was founded in 1973 with two main missions. First, it disseminates current information on metric conversion activity in the United States and throughout the world. Second, ANMC-sponsored sector committees are the focal point for the expression of the voluntary private sector initiative in metric conversion planning.

The main thrust of ANMC is to work with sector committees whose membership reflects the range of those concerned with the segment of the economy or business being dealt with by the committee. This usually consists of business people, trade associations and professional society representatives, consumers, government representatives, small and/or independent businessmen, and labor representatives.

Under the ANMC planning process, sector committees discuss the many issues involved in conversion planning and go through a four step plan development process which includes organization, planning, scheduling and implementation.

To give you a very brief look at the scope of the process, some of the steps in plan development include task identification, description and sequencing, consideration of alternative strategies, assignment of dates when appropriate, dissemination for comment and review and, finally, the development of a consensus.

Currently, ANMC is working with some forty-five sector committees representing forty-five industrial segments. It should be noted here that the level of activity ranges from very active and well along in the metric management process I just described, to relatively little activity beyond identification of a chairman and secretariat. Although a section of the ANMC written submission to the Committee shows the status of the sector committees both in chart and narrative form, a few highlights are in order here.

1. The Chemical and Allied Products Sector

This group has developed a full conversion plan for their industry and is in the process of disseminating its plan summary flyer throughout the industry for comment. To date, 17 000 copies of this leaflet have been distributed to trade associations, individual companies, and other interested and affected parties. Comments are being solicited on this plan for the development of an industry consensus.

2. The Metals Sector

This group, also, has developed a summary leaflet regarding its activities. To date, 14 000 of the flyers have been distributed throughout the metals industry and other related industries.

3. The Petroleum and Natural Gas Sector

This group has developed a draft conversion plan for the retail dispensing of motor fuel. This plan will soon be presented to ANMC for endorsement and to USMB for review.

4. The Construction Industries Coordinating Committee

This group, and its 8 sectors, is currently in the process of finalizing its draft conversion plan and schedule. Plans are under way for a Construction Consensus Conference regarding metric conversion in the second half of 1980. This conference will be jointly sponsored by ANMC, U.S. Metric Board, National Bureau of Standards, and hopefully the National Institute of Building Sciences.

5. The Power Generation Sector and Electrical Goods Sector

Both groups have developed conversion plans for their industries and are in the process of finalizing plan summary flyers for wide distribution and comment.

6. The Construction and Agricultural Equipment Sector

This group, also, has developed a summary flyer regarding its planning activities. The leaflet has been distributed to interested parties in the industry, as well as other related industries.

Other industries are actively investigating conversion, including the food and grocery products and consumer products sectors of the economy.

Currently we are adding sector committees as the need for them is expressed and two essential conditions can be met, namely: 1) financial strength sufficient to permit adequate staff support, and 2) agreement by an organization to be the Secretariat for the Sector Committee. Two such new groups recently added to the ANMC Committee Structure include the Forestry Sector and the Biomedical Sector.

Sector Committee activities include: consideration of a wide range of views of all parties involved, including consumers, labor, small business and government, development of a list of preferred metric units for sector use, identification of measurement-sensitive legislation, codes and regulations, identification of training needs, and making recommendations to standards writing bodies. All of these matters are addressed in Section 6 (1) of the Metric Act, and ANMC Sector Committees are capable of pursuing them.

In fulfilling its mission of disseminating information on metric conversion activities in the U.S. and other parts of the world, ANMC utilizes four main vehicles. These include:

(1) The Metric Reporter

ANMC's *Metric Reporter* is published every two weeks and provides current, first-hand information on business, industry, government, trade and technical



ROY P. TROWBRIDGE

associations and education metric activities.

(2) Publications

ANMC periodically publishes documents relating to special areas of metric conversion. Some of these include: *Metrication for the Manager*, *Metric Editorial Guide*, *A Metric Reference for Consumers*, *Metric Guide for Educational Materials*, *SI Metric Training Guide*, and a series of *Metric Conversion Papers*.

(3) Conferences and Workshops

ANMC annually conducts a conference, which brings together metric planners from all sectors of the economy and all segments of society. ANMC's workshops are designed to provide a complete picture of the factors involved in metric conversion.

(4) ANMC responds to mail and telephone requests for information.

Metric conversion provides an arena in which the private sector can play a responsible role affecting the total society. ANMC has established itself within the private sector and we are pleased that the U.S. Metric Board has recognized our role. ANMC's important part in metric conversion activity is widely acknowledged, from industry leaders such as A. Dean Swift, president of Sears, Roebuck and Co., and Arthur Woelfle, president of Kraft, Inc., and from government leaders such as President Carter and USMB chairman Louis Polk.

Key Areas

Let me now turn to key areas to which I would ask the Committee to pay special attention in their future deliberations. These areas are:

1. The General Accounting Office (GAO) report
2. The role of ANMC and the USMB
3. Legal problems that hinder increasing use of metrics.

GAO

A little over three years ago the U.S. General Accounting Office began a study on the status and implications of metric conversion in the U.S. at the urging of Comptroller General Elmer Staats.

The study was published 1978-10-20, entitled "Getting a Better Understanding of the Metric System — Implications if Adopted by the United States", and released in two volumes — a large detailed book and a smaller executive summary. The basic report is an excellent historical document with much useful information. It provides a fair assessment of positive and negative factors bearing on increased use of metric measurement in the U.S. However, the negative extractions from the report were picked up by the press and caused the momentum in the private sector to slow down. It appears that we're regaining some of that momentum as a result of increased activity on the Metric Board.

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ANMC/MCC coordination



MARTHA DUGGAN



MIKE THOMPSON

Four program managers from the American National Metric Council met with their Metric Commission counterparts in January in order to exchange views and information on metric conversion in their respective sectors.

The importance of continued liaison between the U.S. and Canada was stressed in view of the close trading relationship between the two countries and the necessity of well-coordinated conversion programs in some sectors.

The ANMC was established in 1973 by the private sector to serve as a planning forum for the voluntary conversion to the metric system. ANMC is supported by over 1300 companies, organizations and individuals who feel that those affected by conversion must plan for it.

The American visitors were Cheryl Cummins, program manager for engineering, materials and construction, Martha Duggan, program manager for education, training and consumer advisory committee, Mike Thompson, program manager for food and grocery products, consumer products, a weights and measures advisory group and packaging advisory group, and David Gorin, director of programs with overall staff responsibility for ANMC programs, including all the above, as well as the ANMC steering committee, metric practice committee, labor, government and small business advisory groups.



DAVID GORIN



CHERYL CUMMINS

Hydro goes metric

Ottawa Hydro took advantage of the quieter winter months to convert to metric, resulting in an orderly transition in all areas of operation with maximum benefits and minimum cost and disruption.

Kazi Marouf, engineer and metric coordinator at Ottawa Hydro, says they have had good success with the first phase of their program last winter and are now entering the second phase.

The Ottawa Hydro metric conversion program included converting operations dealing with materials purchased in metric units, such as cable and wire, and drawings which are now being produced according to SI scales.

Mr. Marouf says he conducted a series of half-day metric seminars

for some 400 employees divided into seven groups: outdoor poles and stations workers, clerks and secretaries, technicians, technologists and engineers.

These seminars had a common core of basic SI as well as specialized contents to fill the particular needs of each group.

Each session included a film, a short course on the fundamentals of SI, a hands-on approach to measuring, a test, and the distribution of handouts such as brochures on SI, 20 cm rulers and 5 g candy obtained from Metric Commission Canada.

Mr. Marouf says that metric was generally well received and is planning a second series in the near future.

Metric gains in post-secondary education



Students at the PVI pastry section which is in the process of converting to metric. PVI holds metric changeover courses and seminars for retail staff, consumers and interested persons upon request.



Students in the PVI automotive shop are being trained to work with metric units, now used in the manufacturing of cars throughout the world. Of all Canadian exports to the U.S., about 30% are in automobiles and parts which are now largely in metric units.

Sector Committee 10.03, Post-Secondary Non-University Education, met in February at the B.C. Institute of Technology in Burnaby, with representatives from B.C. vocational and technology education.

Included on the agenda was the tabling of progress reports by each representative, a special review of conversion in apprenticeship training, and a tour of the B.C. Institute of Technology and the Pacific Vocational Institute.

Sector Committee 10.03 members represent post-secondary non-university education in each province. They ensure liaison with metric coordinators from each institute in their province. They provide guidance, through the sector plan, to administrators of post secondary non-university education in planning for the manpower training needs that arise out of Canada's decision to adopt SI. The plan further provides guidance to these administrators for the modification of on-going programs of career-preparatory training, as well as guidance for the design of new programs for updating manpower presently in the work force. The plan suggests a means of providing coordination within the components of the sector and consultation with other sectors.

In British Columbia, a number of trade manuals have been converted to metric. Special progress has also been reported in the area of architecture.

Important concerns for Sector 10.03 are information dissemination to institutions and liaison with industry. The committee coordinates conversion activities with that of industry to assure that graduates will fit into Canada's working community.



Paul Frederickson, carpentry instructor at Pacific Vocational Institute and developer of the Frederickson square, discusses its fine points with Herb Adams, metric coordinator at PVI. This square is based on 250 and can be worked with decimals, a marked advantage with metric units.



While in Vancouver for the Sector Committee 10.03 meeting, B.C. Education Metric Coordinator Bob Baker organized a tour of Simon Fraser University in order to follow the progress in metric conversion and help coordinate future activities. We see him here (r) with Franklin Fuchs, acting metric coordinator for Simon Fraser while machine shop instructor Don Shay explains the workings of a new lathe with digital readout and dual (imperial and metric) capabilities. One of five such units at Simon Fraser University, this lathe was installed last year because of its greater precision as well as its metric capability. Considerable work has also been done at SFU to convert its physical plant.

In Saskatchewan

Most workers now familiar with metric

Eugene Suchoboki, metric coordinator for the Department of Continuing Education in Saskatchewan says that most workers in the province are now familiar with the metric system.

The results of pre-tests given at the beginning of all metric courses to post-secondary students for the past nine years reveal a progres-

sion in metric knowledge from 30 to 70%. As a result of these years of training, requests for metric courses are slowly dwindling.

Mr. Suchoboki says this indicates that the integration of SI in elementary and secondary school curricula is nearly complete.

During the past nine years, some 15 000 people from all walks

of life were trained in metric in 14 community colleges and three institutes throughout Saskatchewan. Courses contain a basic core program and specialty areas.

Mr. Suchoboki says he is now planning metric conversion training in the health sector with the provincial metric coordinator for the department of health.



The participants at the 1980-02-01 meeting of Sector Committee 10.03, Post-Secondary, Non-University Education (L to r, sitting), Ted Ramsay, Manitoba Department of Continuing Education, Eugene Suchoboki, Wascana Institute, Saskatchewan, Charles Williams, Nova Scotia Department of Education, Dave Beckman, Alberta Department of Advanced Education and Manpower, Chairman of Sector Committee 10.03. (Standing) Albert Heckel, New Brunswick Community College, Bob Baker, Department of Education, British Columbia, Georges Desbarats, Metric Commission Canada, Fathi Shalabi, Holland College, P.E.I., John Berry, Metric Commission Canada, Ken Coupland, Ontario Ministry of Colleges and Universities, (Absent: George Williams, Newfoundland Teachers' Association, Denis Latour, Collège Montmorency, Ville de Laval, Québec).



In order to like metric, you have to become familiar with it. Will Dunlop, metric training co-ordinator from the B.C. Ministry of Education is seen here with participants on a two-day workshop on all aspects of metric conversion organized recently by the Victoria Chamber of Commerce. Some 40 people showed up for what was termed an excellent presentation. The participants went home with scads of handouts which ranged from metric kitchen measures and measuring tapes to pamphlets. "We've a better understanding of what this conversion is all about", explained Don Bruce, left, Sylvia Kaiser and Edna Goertzens. Seminar participants included housewives, businessmen, machinists and contractors.

Canadian Chamber of Commerce meets with MCC

Representatives of the Canadian Chamber of Commerce (CCC) met with Commissioner S.M. Gossage; P.C. Boire, Executive Director of Metric Commission Canada (MCC) and MCC staff members on Thursday 80-01-31 in Ottawa. Members of the CCC have met with Metric Commission Canada before and were interested in an update on metric conversion. Mr. Gossage and Mr. Boire reviewed the progress achieved in the metric conversion program nationally to date. Members of the CCC present were provided with documentation indicating key event and completion dates in the metric conversion plans of each sector.

Mr. Gossage said that MCC was generally satisfied with the progress achieved so far. He said that at the same time the Commission would like to have seen the implementation of Sector Plan 3.10 Scales in the Retail Food Industry carried out according to the schedules in that plan. Mr. Gossage said that it is important that all major sectors of the economy should be a part of the program since it is inefficient and costly to have, for example, the consumers and consumer goods suppliers operating in one system while the rest of the economy is operating in another measurement system. He said that this had been foreseen in the *White Paper on Metric Conversion in Canada* which was tabled in the House of Commons in 1970.

Concerning the use of dual units in relation to industry productivity and exports, Mr. Gossage said that experience in Canada, and in other countries which had begun their conversion before Canada did, has revealed that it is inefficient for an economy to be working in dual units and that the costs of production are higher than when a single system is used in all sectors of the economy. Mr. Gossage stated that one reason why it is good for Canada and Canada's economy to go metric is that Canada depends for her livelihood to a large extent on the ability to export. Since Canada's trading partners are already metric or are converting, it is vital that we be able to supply export products and services in the measurement system being specified by our customers.

Pursuing the matter of exports, it was asked whether Canada might lose exports to the United States because of metric conversion. Mr. Boire said that generally speaking the reverse is true. He cited for example that of all Canadian exports to the United States, 31% are in automobiles and parts which are now largely in metric units. He said the fact that Canadian automobile assembly plants and parts manufacturers had planned for metric conversion was a factor in helping to maintain employment for over 100 000 employees at work in this sector in Ontario alone. Mr. Boire noted that in some sectors the United States is ahead of us and he gave the following examples:

Canada exports a fair amount of liquor to the United States and by law (The Federal Alcohol

Administration Act) all packages of spirits have been in metric units since 1980-01-01. At this time Canada has not yet converted this sector. In addition, all wine packaging and retailing in the United States, by the same law, has been in metric units since 1979-01-01.

He referred to the automobile sector indicated previously and stressed that the automobiles being manufactured in Canada in metric units were designed in the United States;

Steel mills in the United States, according to a survey carried out in 1979, were achieving a 6% output of steel products in metric units compared to only 3% in Canada;

It was also noted that: the St. Lawrence Seaway has been operating entirely in metric units since the spring of 1979;

Newsprint is our third largest export to the U.S.A. and over 80% of all U.S. newsprint mills label, ship and invoice their product in metric units;

Most states in the United States have some form of legislation referring to the use of metric units;

Departments of Education in the states of the United States were teaching in metric units;

Recently the fresh fruit and vegetable association of the United States, at a meeting of its board of directors, had agreed to set up a sector committee and to pursue the goal of converting their industry to metric units.

The postponement of the Retail Scales conversion was raised. Mr. Boire said that Metric Commission Canada had carefully evaluated the experiences in Sherbrooke, Peterborough and Kamloops and would put this experience to work when the rest of the country converted. One comment made concerning the cost of new digital scales was that there was no problem in most cases since they paid for themselves within a year. Concerning consumer reaction, Mr. Gossage said that Sherbrooke, where four retailers had decided tentatively to retain metric units, was an example of a marketing area of Canada that would probably not go back to the old units. He said that in the case of Peterborough and in that of Kamloops, there was evidence that retailers were switching back to the old units. He said that if there had been enough community leaders publicly saying that this conversion was good for Canada and Canadians, then consumers and retailers alike in those cities also, not to mention the rest of Canada, would easily convert to metric units even though they might grumble during the short conversion periods involved.

With reference to the use of metric conversion as a non-tariff barrier in Canada, Mr. Boire said that the evidence examined so far by the Working Group on Export/Import Trade of the Metric Commission had not revealed any indication in this regard.

Concerning the establishment of the United States Metric Board, Mr. Gossage said that even though

the American National Metric Council, founded in 1973, had done an excellent job in coordinating the efforts of the American industry and the private sector, there was a need to coordinate government action since governments have an enormous impact in a modern economy. It was therefore perceived that there was a need to also coordinate government action and the various interfaces between government or the public sector and the private sector.

It was noted that it was logical for New Zealand to close down its coordinating agency and hand over the duties of the remainder of metric conversion to the individual government departments because that country was over 85% converted.

Concerning metric conversion in our schools, Mr. Boire noted that: virtually all of the primary school system has converted to metric; the secondary school system is about 70% converted; the post-secondary school system (non-university-community colleges, technical schools) is converting in line with industrial progress; and, at the university level, the evidence is spottier (depending upon the particular university or subject).

Regarding legislation, Mr. Boire noted that the latest piece of Federal amending legislation, Bill S-10, had "died" on the Order Paper with the election call. He also referred to a "Legislative History of Metric Conversion in Canada" which traces references thereto in Parliament since 1871.

One of the bills mentioned therein, Bill C-23, Statute Law (Metric Conversion) Amendment Act, 1976 received Royal Assent on August 5, 1977.

Mr. Boire read the statement of the Honourable Ron Huntington, — "I am convinced that the present and future will demand that Canadians accept the fact that metric is here to stay", as quoted in the MCC Chairman's memorandum sent to all members of sector and steering committees on 1980-01-23. Mr. Gossage made closing remarks saying that what has begun is now irreversible, and that the quicker it is completed the better it will be to keep down costs and raise productivity, to increase exports, and reduce consumer frustration at using two systems instead of one.

METRIC SEMINAR KIT AVAILABLE



HOW TO ORGANIZE A SEMINAR ON METRIC CONVERSION

The purpose of a metric seminar is to give adults practical experience in using the metric system, as well as to provide other pertinent information about this system of measurement. If you would like to organize a seminar for your group, the booklet *How to organize a seminar on metric conversion* is available free of charge from:

Metric Commission Canada
Box 4000
Ottawa, Ontario
K1S 5G8.

Singapore: Legislation to complete conversion by 1983

The following is reprinted with permission from the Business Times, Singapore, 1979-11-23.

The metric system is gaining popularity in the retail sector. Last year, 95 percent of textile retailers were selling in metric. Wholesalers and retailers of rice have also converted to metric units since October 1978.

However, the Metrication Board indicated in its latest annual report that it will consider legislation to complete the metric conversion exercise by 1983.

The first stage of legislation took effect from July this year with the enforcement of an order under the Weights and Measures Act of 1975. This regulates the standard metric sizes of "quantity critical" prepacked goods.

Items affected by the order are butter, rice, granulated white sugar, plain wheat flour and cooking salt. The Board has also

drawn up the schedule for the metric conversion of 20 items under the "quantity non-critical" category.

The conversion of these items was scheduled to take place in three stages, with the final stage taking place next year. Items included for conversion by then are toothpaste, flavouring essence, deodorants, jelly and ghee.

The board will also require a standard metric range for bleaching lotion and ghee from January next year. In the case of evaporated milk, the standard metric size was fixed at 410 g while instant noodles must be sold in multiples of five grams.

Metric conversion in the other industries is progressing fairly smoothly. Most of the difficulties are encountered in the aviation industry. Three factors were listed for this.

The pace of conversion in this industry is very much dependent on international regulatory bodies

which have yet to make a firm decision on the use of metric. There is a lack of metric standards and equipment, leading to a higher risk of human errors during the transitional period.

Major aircraft manufacturers are, however, doing their bit by offering metric options to prospective customers. Singapore Airlines has also converted its fuel flow gauges and temperature indicators.

In the building and construction industry, metric conversion was more successful. Since July last year, all six developers in the public sector have switched to metric. Other statutory boards and a significant number of private developers have also gone metric.

In the catering sector, metric conversion proved to be popular with restaurants in the hotels but less so in other establishments.

The board has asked the Singapore Restaurant Owners' Association to encourage its members to switch to metric voluntarily.

EEC drinks metric

(From page 1)

allowed a prepackaged liquid to be sold in a "temporarily allowed" size on 1973-01-31, that "tem-

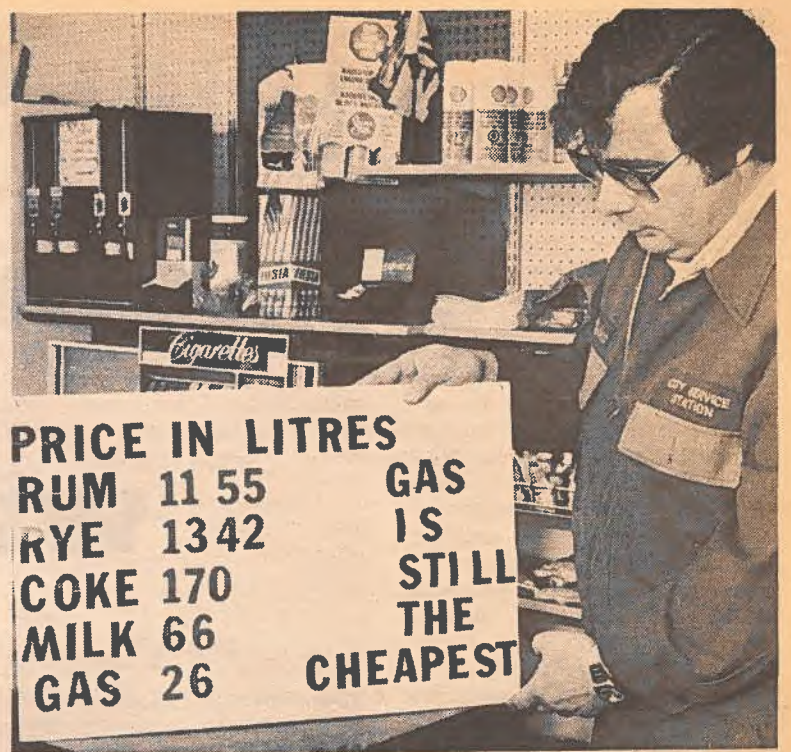
porarily allowed" size can continue to be sold until 1988-12-31, a fifteen year spread.

Here is a table of allowed sizes as annexed in EEC directive L308/28. (1)

Liquids	Nominal volume of contents in litres	
	I Definitively allowed	II Temporarily allowed
1. (a) Wine of fresh grapes; fresh grape must with fermentation arrested by the addition of alcohol including wine made of unfermented grape juice blended with alcohol, except for wines included in Common Customs Tariff subheadings 22.05 A and B and liqueur wines (CCT subheading ex 22.05 C); grape must, in fermentation or with fermentation arrested otherwise than by the addition of alcohol (CCT heading No. 22.04)	0.10 — 0.25 — 0.375 0.50 — 0.75 — 1 1.5 — 2 — 3 5	0.35 — 0.70 — 0.73 1.25
(b) "Yellow" wines entitled to use the following designations of origin: "Côtes du Jura", "Arbois", "L'Étoile" and "Château-Chalon"	0.62	
(c) Other non-sparkling fermented beverages, for example, cider, perry and mead (CCT subheading 22.07 B II)	0.10 — 0.25 — 0.375 0.50 — 0.75 — 1 1.5 — 2 — 5	0.35 — 0.70
(d) Vermouths and other wines of fresh grapes flavoured with aromatic extracts (CCT heading No 22.06); liqueur wines (CCT subheading ex 22.05 C)	0.05 up to 0.10 0.10 — 0.20 — 0.375 0.50 — 0.75 — 1 1.5	
2. (a) — Sparkling wines (CCT subheading 22.05 A)	0.125 — 0.20 — 0.375 0.75 — 1.5 — 3	0.10 — 0.25 — 0.70
— Wine in bottles with "mushroom" stoppers held in place by ties or fastenings, and wine otherwise put up with an excess pressure of not less than one bar but less than three bar, measured at a temperature of 20°C (CCT subheading 22.05 B)		
(b) Other fermented sparkling beverages, for example, cider, perry and mead (CCT subheading 22.07 B I)	0.10 — 0.20 — 0.375 0.75 — 1 — 1.5 3	0.125
(a) Beer made from malt (CCT heading No 22.03), excluding acid beers	0.25 — 0.33 — 0.50 0.75 — 1 — 2 3 — 4 — 5	0.35
(b) Acid beers, gueuze	0.25 — 0.375 — 0.75	
4. Spirits (other than those of CCT heading No 22.08); liqueurs and other spirituous beverages; compound alcoholic preparations (known as "concentrated extracts") for the manufacture of beverages (CCT heading No 22.09)	0.02 — 0.03 — 0.04 0.05 — 0.10 (*) 0.20 — 0.50 — 1 1.5 — 2 — 2.5 3	0.35 — 0.375 — 0.70 0.75
5. Vinegar and substitutes for vinegar (CCT heading No 22.10)	0.25 — 0.50 — 0.75 1 — 2 — 5	
6. Olive oils (CCT subheading 15.07 A), other edible oils (CCT subheading 15.07 D II)	0.25 — 0.50 — 0.75 1 — 2 — 3 5 — 10	
7. — Milk, fresh, not concentrated or sweetened (CCT heading ex 04.01), excluding yoghurt, kephir, curdled milk, whey and other fermented or acidified milk	0.20 — 0.25 — 0.50 0.75 — 1 — 2	0.10
— Milk-based beverages (CCT subheading 22.02 B)		
8. (a) Waters, including spa waters and aerated waters (CCT heading No 22.01)	0.125 — 0.20 — 0.25 0.33 — 0.50 — 0.75 1 — 1.5 — 2	all volumes below 0.20 — 0.35 — 0.45 0.46 — 0.70 — 0.90 0.92 — 1.25
(b) Lemonade, flavoured spa waters and flavoured aerated waters and other non-alcoholic beverages not containing milk or milkfats, (CCT subheading 22.02 A) excluding fruit and vegetable juices falling within CCT heading No. 22.07 and concentrates	0.125 — 0.20 — 0.25 0.33 — 0.50 — 0.75 1 — 1.5 — 2	all volumes below 0.20 — 0.70
(c) Beverages labelled as alcohol-free aperitifs	0.10	
9. Fruit juices (including grape must) or vegetable juices, whether or not containing added sugar, but unfermented and not containing spirit falling within CCT subheading 20.07 B, fruit nectar (Directive 75/726/EEC of 17 November 1975 on the approximation of the laws of the Member States concerning fruit juices and certain similar products ⁽¹⁾)	0.125 — 0.20 — 0.25 0.33 — 0.50 — 0.75 1 — 1.5 — 2	all volumes below 0.125 — 0.70 — 0.18 0.35 (in cans only)

(*) In the case of alcoholic beverages to which aerated water or soda has been added, all volumes of less than 0.10 L are allowed definitively.

(1) OJ No. L, 311, 1. 12 1975, p. 40.



Robert Cantwell, Charlottetown, P.E.I. service station proprietor, makes a point with this sign in which gasoline prices compare favorably with those of beverages.

Upcoming meetings

DATE	COMMITTEE	PLACE
80-03-06	Sector 3.09 — Plastics Industry	Toronto
80-03-06	Sector 2.33 — Metal Working Machines, Machine Shops, Tool and Die Shops and Cutting Tools	Toronto
80-03-07	Sector 2.31 — Construction and Agricultural Equipment	Toronto
80-03-11	Sector 1.01 — Air Transport	Montreal
80-03-13	Sector 3.03 — Aircraft & Aircraft Parts Manufacturers	Ottawa
80-03-14	Sub-Committee 62.21 — Flavour Crystals	Toronto
80-03-17/18	Sector 3.06 — Electric Power	Montreal
80-03-20	Sector 7.20 — Clothing	Montreal
80-03-24	Sector 63.06 — Packaged Waters	Toronto
80-03-25	Sector 10.01	Victoria
80-03-25	Sector 61.03 — Poultry	Toronto
80-03-26	Steering Committee 10	Victoria
80-03-26	Sector 61.06 — Fishing and Fish Products	Ottawa
80-03-26	Sub-Committee 9.60 — Labour Organizations — Monitoring Meeting	Burnaby
80-03-26	Sub-Committee 62.23 — Chocolate Drinks	Toronto
80-03-27	Sub-Committee 8.20 — Wood Liaison Sub-Committee	Ottawa
80-03-27	Steering Committee 9 —	Victoria
80-03-27	Sector 7.30 — Leather Footwear	Montreal
80-03-28	Sector 8.20 — Wood	Ottawa
80-04-01	Sector 8.17 — Urban Forestry and Arboriculture	Winnipeg
80-04-03	Sector 2.25 — Builders and Home Hardware	Toronto
80-04-08	Sector 2.28 — Wire and Wire Products	Toronto
80-04-10	Sector 9.21 — Amusement and Recreation — Sports	Ottawa
80-04-11	Sub-Committee 8.45 — Publishing Public Awareness Sub-Committee	Toronto
80-04-15	Sector 2.07 — Shipbuilding and Ship Repairing	Toronto
80-04-15	Steering Committee 8	Victoria
80-04-15	Sector 5.02	Montreal
80-04-15	Sector 7.49 — Luggage and Leather	Toronto
80-04-16	Steering Committee 63 — Beverages	Vancouver
80-04-17/18	Sector Committee 10.04	Montreal
80-04-24	Sector 9.40 — Accommodation and Food Services	Toronto
80-04-24	Sector 3.05 — Communications	Ottawa
80-04-25	Sector 62.03 — Meat Packers	Toronto
80-04-29	Sector 7.41 — Jewellery	Toronto

Metric Commission Canada Meetings

80-04-01/02 56th Meeting Ottawa

Other Meetings

80-03-18/19 IMCC (Provincial Contacts) Ottawa
80-03-31 Annual Press Conference Ottawa
80-03-31 ACIP Meeting Ottawa

Exhibits

80-03-20/30 Salon National de l'Habitation Montreal
80-03-31 to Royal Manitoba Winter Fair Brandon
80-04-05
80-04-20/23 HostEx '80 Toronto
80-04-23/25 Salon de la Publicité et de la Communication Montreal

New Zealand completes conversion

(From page 1)

committees negotiated with national associations and organizations rather than with local interests or individuals.

All sector and divisional committee members were appointed by the Board on the nomination of appropriate national organizations. Divisional chairmen were members of their sector committee. All committees were free to consult each other to coordinate their plans. The Board's staff provided secretarial service to all committees and also assisted in coordination work. All timetables were submitted to the Board for approval.

It was established early on that all costs would be paid by those who incurred them, and that the target would be substantial conversion, meaning 75 percent, by the end of 1976.

All timetables for change were planned for implementation within the seven-year voluntary program. The community and industries cooperated well and by the end of 1976 only two timetables had not been actioned. These were loaves of bread in metric sizes and postal charges related to metric weight steps and metric dimensions. The delay was largely caused by lengthy negotiations related to price freezes and controls. Both of these items made a smooth transition to metric measures in 1977.

Industrial Training

By this time all manufacturing and processing industries had changed to metric units in accordance with the timetables worked out in their sectors. Commercial transport, motoring, petroleum retailing and wholesaling, and weighing machine conversion, for many industries, education and apprentice training all had to be coordinated with each other and with many parts of the economy. This was a very detailed exercise. As an example, the timetable for the packaging industry had 121 separately timed events.

Retraining of the workforce was made very widely available. The Technical Institutes and the Industrial Training Service (I.T.S.) of the Labour Government did a magnificent job in training key personnel in industry. Priority was given to leading hands (industry leaders) in the manufacturing, engineering and construction industries so that they in turn could pass on the lessons to those under their control. The self-employed and all certificated tradesmen also had an entitlement to retraining classes. Many industrial concerns conducted their own retraining, sometimes assisted by Technical Institutes or the I.T.S.

Public Information

Our Public Relations Sector contained five Board members. Education, the Federation of Labor and the Department of Trade and Industry were represented as were the press, broadcasting, retailers, and the Information and Publicity Service of the government.

The public relations campaign was divided into three phases — awareness, knowledge and involvement — and as intended, these merged from one to the other as the program proceeded. We consulted with many experts and hired advertising agencies to conduct specific campaigns on the subjects of public education, meat and fish retailing, *The Householder* book, which was mailed to every household, textiles and clothing retailing, assistance to homemakers, consumer education, and motorists education. We hired the Heylen Research organization to conduct two surveys to monitor our progress. In all, about \$250 000 was spent on informa-

tion and publicity campaigns by contract and about an equal amount has been expended by the Board on information and publicity services which include the eleven metric memos made available free at every post office throughout New Zealand. Our metric memos are being widely used throughout the world, with and without our permission.

Our specialized publications for various sections of industry have promoted the changeover, and

Retail Trade

The change to metric units in retail food, household supplies and textiles was planned for action during 1974, 1975 and 1976, and good progress was made during those years. It became apparent during 1976, however, that the retail trade would not be completely metric by the end of 1976 because a few retailers refused to make the change and it also became apparent that in some like cloth and carpet measured-out

and cut for each customer, refused to change. Some said, "We will change only when the law requires it." This annoyed the retailers who had changed and through their federations they began to press for compulsion.

Weights & Measures Regulations

At the end of 1976 the government on the advice of the Board and the retailers introduced legislation taking power to issue regu-

measure. Retailers had the option until 1979-06-30 of supplementing the metric information with the equivalent imperial information presented with less prominence than the metric. Parallel arrangements applied to prepackaged goods.

All of the regulations issued to accomplish the complete metrication of trading by weight or measure have been accepted without protest or even comment by those concerned and are working well. There have been no prosecutions for breaches of these regulations which are being administered with understanding and consideration by the weights and measures officials.

It is only in respect to trading by weight or measure that compulsion by law to use metric units has been invoked. Many other changes in law have been made but these are more in the nature of recognition of accepted changes than a means of enforcing the change, and none of them have ever been contested.

Board's Work Comes to Close

All except three of the 32 planning committees set up by the Metric Advisory Board to accomplish the change are in recess because their work is done or almost completed. Still active are the Divisional Committee on Building Services and the Sector Committee on Engineering and Engineering Servicing Industries. Both of these committees are concerned with mechanical equipment the metrication of which is dependent on progress abroad to an extent that does not apply to any other part of the New Zealand economy. The Packaging Advisory Committee set up to promote rational pack sizes is still active. These three committees will meet in 1980 and report to the Department of Trade and Industry.

On 1979-12-31 the New Zealand Metric Advisory Board will disband, having accomplished the objectives for which it was set up. The office of the Board's secretariat will close on 1979-12-24 as will its post office box. The Board and the government agree that it is no longer necessary for the Board to meet nor to continue its services to the community. The Board has met 45 times.

Any matters concerning metrication in New Zealand after 1979-12-31 will be the concern of the Department of Trade and Industry, Private Bag, Wellington, New Zealand, and the same applies to any questions from outside New Zealand. Ian D. Stevenson, the Board chairman, will be available to the Department of Trade and Industry during 1980 for consulta-

tion. The Board acknowledges that although the weighing and measuring equipment of New Zealand, the education system, the thought processes of the rising generation, manufacturing and processing industries, farming, virtually every other activity including sports and games, and the market place are all now predominantly metric, nevertheless the adult population has still a long way to go in the matter of thinking spontaneously in metric units. Furthermore, this applies to many who are using metric units with facility in their work but not elsewhere.

In mid-1977 regulations were issued to prohibit the verification of nonmetric new weighing or measuring instruments used for trading and to prohibit the re-verification of non-metric instruments used for trading after 1977-10-31.

Early in 1978 regulations were issued requiring metric weights and measures to be used in the selling, pricing and advertising of all goods retailed by weight or

CAPTAIN METRIC

**CAPTAIN METRIC IS EVERYWHERE
THINK METRIC**

Examples of Average Common Units

- Average truck tire pressure
450 kPa (kilopascals)
- Air tank pressures
15 MPa (megapascals)
31 MPa
- Mass of axe
2 kg (kilograms)
- Pressure gauge
0 to 4000 kPa (kilopascals)
- Hose sizes
38 mm (millimetres)
65 mm (millimetres)
- Aerial ladder height
30 m (metres)
- Volume of master stream
4000 L/min
(litres/minute)

The following publications are available from the Fire Marshal's or Fire Commissioner's office:

- Report on Recommendations for Standardized Scales, Fire Fighting Equipment and Operations.
- Training Guidelines for Metric Conversion in the Fire Services of Canada.
- Summary of Metric Conversion Plan for Sector 2. 27 Fire Fighting Equipment and Operations.

Metric Commission Canada / Commission du système métrique Canada

YOU MAY OBTAIN A FREE COPY OF THE ABOVE POSTER BY WRITING TO METRIC COMMISSION CANADA, BOX 4000, OTTAWA, K1S 5G8.

great credit is due to our committees and our secretariat for these authoritative guides.

Education

The conversion of the whole education system to the use of metric units at primary, secondary and tertiary levels has been a massive exercise and a decisive factor in the success of our operations. The two largest teacher organizations each had a seat on our original Board and the Board contained no less than five educators out of sixteen members. The cooperation of all on the teaching and administrative divisions of education has been good.

cases these retailers had a trading advantage by retaining the use of the old familiar units.

It was almost entirely in transactions where quantities were weighed — or measured — out for the customer that there was insufficient progress towards the use of metric units. In prepackaged foods and made-up clothing progress was good, and it appeared likely that the voluntary approach would accomplish the objective in respect of these items, though not in the time planned.

The larger manufacturers and retailers including the supermarkets had changed to metric units throughout, but a few small retailers, mainly selling meat, fish, fruit and vegetables, and also textiles

lations requiring all selling, pricing and advertising for retail trading by weight or measure to use metric units. This legislation was fought by the opposition party in Parliament but passed. The seven-year voluntary program finished with over 85% of the economy converted to metric.

Early in 1978 regulations were issued requiring metric weights and measures to be used in the selling, pricing and advertising of all goods retailed by weight or

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ANMC Reports Progress

(From page 3)

Simplified packaging

Another GAO study dated 1978-04-28, highlights some positive aspects that can be achieved by converting to the metric system. I quote:

"The Metric Conversion Act directs the U.S. Metric Board to encourage standardization organizations to promote rationalization or simplification of packaging relationships and the reduction of size variations. GAO believes modularization provides such an opportunity.

The federal government spent an estimated \$10 300 000 000 for food in fiscal year 1977. This amount can be reduced by using "modularization" — a system geometrically relating the size of food shipping containers to one another. Benefits include reduced damage, increased productivity and possibly lower prices to the consumer.

Benefits from this system have been realized in European countries, but little is being done within the United States." (CED 78-81 April 28, 1978)

The Roles of ANMC and the USMB

I am pleased to report that a close and complementary relationship is being built between the USMB and the ANMC. This relationship is necessary to assure compliance with the Metric Conversion Act of 1975 provisions that state that the Metric Board must consult with and take into account the interests, views and costs of groups affected by metric conversion, and take into account existing conversion efforts to avoid unnecessary duplication.

The Metric Board has further recognized the key role of private sector initiative as expressed in a Board resolution adopted 1978-04-03 as follows:

"The U.S. Metric Board has noted the substantial contributions of the American National Metric Council in providing leadership in the private sector for managing the increasing usage of the metric system in business and industry. The U.S. Metric Board hereby records its position that the continued contributions of the American National Metric Council is a necessary ingredient of an effective total program in the United States."

Public information

ANMC confines its activity to that of being the framework within which private industry may meet and undertake the often long and tedious road towards increasing use of metric. We view ourselves as the source from which plans will emanate to assist industry in grasping the potential opportunities and benefits offered by a change to SI Metric.

On the other hand, we believe that it is important that the Congress recognize that the USMB must be adequately staffed and funded for the job that it is best suited to do. In our view, one of the most important jobs is to provide adequate public information and awareness programs.

Private sector plans

Also, the USMB must be equipped to provide the private sector with support in broadcasting and further coordination of private sector plans outside the ANMC framework to achieve the broadest possible acceptance throughout our nation.

In our view, a strong ANMC can and will continue to provide leadership and assistance to those in the private sector who wish to voluntarily plan for metric conversion. A well funded and adequately staffed Metric Board

will complement our efforts through public information and government liaison and coordination on all levels, and by providing assistance and support through public hearings and other means at its disposal.

As I stated, this complementary relationship is now being built between ANMC and the USMB. We will not hesitate to represent the interests of our constituency and speak up if the government, or the USMB, takes actions which we believe are not in the best interests of one of our sectors or the nation.

Legal Concerns

Many legal questions confront American industry involved with metric conversion. The Fair Packaging and Labeling Act (FPLA) enacted by the Congress encouraged industry to reduce the proliferation of sizes that may have existed. FPLA encouraged industry to meet under the auspices of the Secretary of Commerce to accomplish this task.

Further, Section 6 (4) of the Metric Conversion Act states that the USMB should encourage metric standardization activities to take advantage of opportunities for rationalization, design improvements, reduction of size variations and increases in economy.

Recently, Ky P. Ewing, Jr., Deputy Assistant Attorney General, Antitrust, U.S. Department of Justice, addressing the 1979 ANMC Annual Conference noted:

"There may exist possible efficiencies associated with reasonable standardization programs being introduced at the same time that retooling and planning is already being done to achieve metrication. The need for such standardization, rationalization or simplification efforts should be clearly and convincingly demonstrated, because such programs can have serious anticompetitive effects which are not necessarily inherent in the metrication process itself — for example, in the consumer product area where there is often very little need for container-size standardization.

Government agencies involved in the metrication effort should similarly be reluctant to incorporate industry-wide standardization into regulations promulgated ostensibly for the purpose of converting to the metric system. Standardization must be clearly justified and procompetitive."

Soft drinks metric

In 1978-02, the National Soft Drink Association requested the antitrust division of the Justice Department to review whether and under what conditions the association might develop voluntary guidelines for the use of metric containers in the soft drink industry.

John Shenefield, Assistant Attorney General in charge of the antitrust division replied that it was "impossible to assess the competitive effects of any guidelines without a more concrete submission."

"The antitrust implications of such a meeting depend upon the nature of the discussion and the impact of any agreements reached," wrote Shenefield.

Mr. Shenefield's answer did not provide any encouragement for the group to proceed.

At the annual conference in 1976, then Assistant Attorney General, Thomas E. Kauper, Antitrust Division of the Department of Justice, made the statement that "while some have expressed concern that participation on metric committees and panels, envisioned by the Metric Conver-

sion Act, might expose them to antitrust liability, I regard that possibility as more illusory than real."

Rule of reason

Kauper cited the long standing practice of the Supreme Court in applying the "rule of reason" in determining whether a particular restraint activity violated the Sherman Antitrust Act. This assures that a particular restraint will be considered in the context of unique industry problems, with special sensitivity towards the circumstances surrounding its adoption and implementation. However, he went on to detail some of the potential pitfalls surrounding the setting of industry standards, even when there appears to be widespread agreement on the benefits of such standards.

Committee meetings open

In its early organizational phase, ANMC applied painstaking effort in developing its committee structures and procedures to insure that committee activities would be as fully in compliance with the antitrust laws as could be imagined. The procedures were developed by a group of experienced lawyers familiar with antitrust laws, and were written to comply with the Federal Advisory Committee Act.

These procedures specify that all interested parties are eligible to serve on ANMC's sector committees and that all sector committee meetings are publicized and open to anyone who wishes to attend. Minutes of all meetings are available upon request by any individual or organization. In short, ANMC committees operate in a fishbowl, with corporate producers, users, government, labor and other interests present.

Notwithstanding these extensive precautionary measures, corporate counsels are not consistent in advising their clients regarding ANMC sector participation. The more cautious advise companies to avoid any exposure by non-participation. Many others support Kauper's view that antitrust exposure is "more illusory than real." This dichotomy creates a problem for ANMC and for the orderly process of metric planning because consensus becomes difficult, if not impossible, without the broad participation of all elements constituting a given industry or sector.

Metric board guidance

The U.S. Metric Board has underway a study of the antitrust laws and how they affect metric conversion activities. The problems, whether real or perceived, suggest that firm guidance is needed and we commend the Board for its activity in facing this issue. We hope, should it be necessary in the future, that the Congress will act appropriately to deal with the problems presented by the antitrust laws and that these laws will not become a perceived barrier to conversion planning.

GM metric

I thought you might be interested in what is happening with respect to metric conversion in General Motors. Early in 1973 GM made a commitment to convert North American product designs to metric following these guidelines:

First, new development would be metric from the start. This would include items in current development stages.

Second, service parts and in-production parts would be left alone.

Third, supplier coordination would be implemented.

Fourth, capital equipment would be purchased with dual measuring capability where applicable.

Today, 27 passenger car nameplates in the General Motors

mix of domestically made automobiles are predominantly metric.

There are only 7 remaining nameplates which have not been fully redesigned since the initiation of the metric policy in 1973, but it's anticipated that these too will be metric by the early 1980s.

North American commitment

General Motors' primary purpose in adopting this metric policy was to enable it to design, manufacture and market similar or identical products or components all over the world.

Corporation management was aware of the trend in measurement systems and attitudes abroad, and were convinced that GM should change its North American practices.

Consumer advantage

The change to metric offers a unique opportunity. It gives government workers, industry, consumers and all other segments of the economy an opportunity to work together in a cooperative rather than adversary relationship to assure that the changeover will be done with the least disruption and will provide the greatest benefits to everyone involved.

As a new product line is being designed for use in a metric economy, the change to metric can provide the opportunity to reduce product mix with advantage to the consumer.

One metric system

(From page 2)

The value adopted in the International Service of Weights and Measures for the standard acceleration due to gravity is 980.365 cm/s², the value already stated in the laws of some countries.

In 1927, the 7th CGPM redefined the metre to the international prototype; established a Consultative Committee for Electricity.

In 1933, a Consultative Committee for Photometry was established.

In 1935, the International Electrotechnical Association adopted the Giorgi System, which is based on rationalizing the MKS (metre, kilogram, second) system and electric and magnetic units. This was the forerunner of the MKS, a system which led to SI units.

In 1937, a Consultative Committee for Thermometry was established.

In 1946, the CIPM submitted resolutions on the following: new candle, new lumen, unit of force, joule, watt, ampere, volt, ohm, coulomb, farad, henry and weber.

In 1946, the International Standards Organization (ISO) was founded with headquarters in Geneva, Switzerland. Canada was represented at the founding conference. It was agreed that membership would be held by national standards bodies, ISO having non-government status among the organizations associated with the United Nations.

Only recommendations are made from ISO to its member countries; these become standards when they are officially adopted for national use. In the case of Canada, the Standards Council of Canada is the official body.

At the 9th CGPM in 1948, the term "candela" replaced the "new candle". The term "lumen" replaced the "new lumen". The newton was accepted for unit of force. The degree "Celsius" was adopted.

The unit of quantity of heat became "joule". Also adopted were the principles of writing and printing unit symbols and numbers.

In 1952, a Consultative Committee for the definition of the Metre was formed.

Costs Less than Estimated

There have been very few difficulties during this six-year changeover and comparatively little expense. GM's out-of-pocket expense over that period has been estimated at only \$9 million. Because GM used the rule of reason in converting and did not go back and redesign products nor make major changes in its manufacturing equipment, costs have turned out to be less than one percent of cost estimates that had been made in the mid 1960s.

There have been offsetting benefits to General Motors one of which we have been able to report to Dr. Louis Polk, chairman of the U.S. Metric Board. The change to metric afforded the opportunity for one GM division to examine its practices with regard to electrical wire. Subsequent resizing and reduction of variety have resulted in a cost avoidance of \$1.6 million annually. Thus, the savings in this single division for a six-year period more than pays the corporate expense of metric conversion and the benefits will continue to be realized far into the future.

General Motors is a charter member of ANMC, and GM will continue its support of the council with a full corporate subscription and through participation of GM personnel in the various committee and task group activities of the council. We feel this is a very important activity and are pleased to be a part of it.

At the 10th CGPM in 1954, members adopted as base units of this "practical system of units", the units of the seven quantities: length, mass, time, electric current, thermodynamic temperature and luminous intensity.

In 1960, the 11th CGPM adopted the name International System of Units, with the international abbreviation SI and laid down the rules for the prefixes, the derived and supplementary units and other matters, thus establishing a comprehensive specification for units of measurement.

In 1971, the 14th CGPM considered the advice of the International Union of Pure and Applied Chemistry and of the International Organization for Standardization, concerning the need to define a unit of amount of substance and decides:

1. The mole is the amount of substance of a system which contains as many elementary entities as there are atoms in 0.012 kg of carbon 12; its symbol is "mol".
2. When the mole is used, the elementary entities must be specified and may be atoms, molecules, ions, electrons, other particles, or specified groups of such particles.
3. The mole is a base unit of the International System of Units.

* * *

The 16th Conference, in 1979, adopted both the capital "L" and the small "l" as symbols for the litre. These will be discussed at a future conference with a view to eliminating one of them.

The 16th CGPM also agreed on a new definition of the candela: "The candela is the luminous intensity, in a given direction, of a source which emits a monochromatic radiation of 540 x 10¹² Hz and whose energetic intensity in that direction is 1/683 W/sr. The candela in its new definition is the base unit applicable to photopic and scotopic quantities as well as mesopic quantities."

The 16th Conference also adopted the special name "sievert", symbol Sv, for the SI unit of dose equivalent in the field of radiation protection. The sievert is equal to one joule per kilogram.