



Metric
Commission

Commission du
système métrique

Address by
S. M. Gossage
Chairman, Metric Commission
to
The Canadian Club of Toronto
7th January 1974

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Why are we considering metric conversion? The short answer is because it is inevitable. If it is inevitable, conversion should come as a planned program, not haphazard.

Measurement goes back to the earliest formalized records of man. Once man could count he needed a standard for comparing quantities. Measurement was devised to create this standard.

Early measurement standards were generally taken from common physical objects. In the ancient world one system of measurement of length was based on parts of man himself. The smallest unit was the width of a finger, or a digit; four digits made one palm, or the width of the hand above the thumb. The span was the spread between the outstretched thumb and little finger, which equalled three palms; the cubit was the distance between the elbow and the tip of the middle finger, equalling two spans or six palms; the pace was equal to ten palms, and the fathom, the distance between the outstretched arms, was four cubits. Man, of course, is strictly a non-standard article, so basing standards on his physical measurements was a rather dicey procedure; yet the Egyptians, using this system of measurement, built the Great Pyramid of Khufu with an estimated mean error in the length of the sides of only one part in 4000!

A present day standard which is a curious survival of these ancient measurements is the standard gauge of railways, 4 ft. 8½ in. This is the old Roman marching passus or double pace. The Roman Chariot wheels were set this distance apart, as is shown by ruts preserved under the lava in the streets of Pompeii; and the standard persisted through the centuries to reappear in the Stockton and Darlington railway of George Stephenson and other coal haulage ways of the north of England.

The trouble with these early standards of measurement was that each different locality, almost each different occupation, might use a different standard. In days of poor communications and limited trade the confusion could be tolerated; but with the advent of better communication and burgeoning trade the need grew for more widely accepted standards.

In England this need was met by a pragmatic adaptation of the older measures. The result is a series of measurements units that have grown out of the practices of the various trades, well enough suited to their immediate purposes but haphazard and illogical in their relation one to another. France on the other hand tackled the problem in the enthusiasm of revolution when everything was to be made new for a brave new world. A completely fresh, coherent and logical system of measurement was constructed, the metric system.

The metric system has had its ups and downs, and has been modified over the years. First instituted in France in 1795, it was not finally adopted on a mandatory basis until 1840. For scientific purposes it was codified in what was known as the cgs (centimetre, gram, second) system; later for more practical industrial uses the mks (metre, kilogram, second) system was adopted. Both of these systems have now been superseded by the internationally approved *Système International d'Unités* or "SI" units. It is this system as adopted by the General Conference of Weights and Measures in 1960 that Canada proposes to make her standard of measurement.

This movement to adopt a standard metric system of measurement is world-wide. Apart from the English speaking world the use of metric measures is universal. India adopted them after independence and Japan completed a long process of conversion during the last decade.

Within the English-speaking world Great Britain in May, 1965, declared for a gradual adoption of metric units looking to that system becoming in time the primary system of weights and measures for the country as a whole. In 1968, after receiving a report from a Standing Joint Committee on Metrication, the Government accepted a target date of the end of 1975 for the country to be predominantly metric. In a White Paper issued in February 1972, the Secretary of State and Trade and Industry reaffirmed the reasonableness of the target date of 1975.

In its original declaration the government laid down the policy that costs would "lie where they fall". They have adhered strictly to this policy and have not suggested any change in it.

Australia passed a Metric Conversion Act in June, 1970, stating as its object the bringing about progressively the use of the metric system of measurement of physical quantities. A Metric Conversion Board was set up to plan, guide and facilitate conversion, to prepare an overall program and to coordinate implementation. A target date for completion was set for the end of 1979. The announced policy of the Government is that costs of conversion will in general be borne by those incurring them.

During the past three years numerous industry committees have been established. These committees have prepared timetables for conversion of their industries and implementation of conversion is now in full swing. The Board is aiming at conversion being 70 percent complete by the end of 1976.

New Zealand established a Metric Advisory Board in 1969 and in April, 1970, the Government announced approval in principle of converting to the metric system of measurement over a seven year period, giving a target date for

substantially complete conversion by the end of 1976. Again costs are generally to be met by those incurring them

South Africa commenced its program of metric conversion in 1966 and it is now substantially completed. No significant difficulties have been experienced. The conversion has relied to a much greater degree on directives from the Government than has been the case in Great Britain, Australia or New Zealand. Some compensation is contemplated for costs of converting weighing and measuring devices used in trade.

The United States Congress in 1968 passed the Metric Study Act directing the Secretary of Commerce to arrange for a broad enquiry and evaluation of the policy choices open to the United States in regard to the possible adoption of metric units of measurement. This became the U.S. Metric Study; the report based on this study is entitled "A Metric America: A Decision Whose Time Has Come". The recommendation of the report is as follows:

"On the basis of the evidence marshalled in the U.S. Metric Study, this report recommends that the United States change to the International Metric System through a co-ordinated national program over a period of ten years, at the end of which the nation will be predominantly metric."

This report was forwarded to Congress by the Secretary of Commerce. He stated his agreement with the conclusion of the report and recommended a firm government commitment to the goal of metric conversion. Bills were submitted both in the House of Representatives and the Senate to make effective the recommendations of the report and to provide for a non-mandatory conversion over a period of ten years.

The Senate held two days of hearings last year and in August passed a bill designed to implement the recommendations of the report.

Unfortunately, there was not time for the House of Representatives to act before adjournment so the bill died with the 92nd Congress. The present 93rd Congress has before it similar bills to make effective the recommendations of the Metric Report. At hearings held early this year by a Subcommittee of the House Science and Astronautics Committee submissions made were overwhelmingly in favour of metric conversion. A clean bill has been reported out by the Committee and is now before the Rules Committee. This bill is on the President's priority list to be dealt with at the present session.

In Canada the Government issued a White Paper in January, 1970, setting out the broad principles of its policy in regard to the metric system of measurement as follows:

- (i) The eventual adoption in Canadian usage of a single coherent measurement system based on metric units should be acknowledged as inevitable and in the national interest.
- (ii) This single system should come to be used for all measurement purposes required under legislation, and generally be accepted for all measurement purposes.
- (iii) Planning and preparation in the public and private sectors should be encouraged in such a manner as to achieve the maximum benefits at minimum costs to the public, to industry and to government at all levels.

Subsequently in June, 1971, the Government by Order in Council established the Metric Commission. The Commission is instructed to investigate the implications of conversion to the metric system. It is to prepare an overall plan for conversion, coordinating the process in the different sectors of the economy so as to effect the change at the lowest cost consistent with obtaining the best advantage to Canada. It is asked to advise the Minister on the need for legislation or other action to facilitate the conversion but

has no power of enforcement. Conversion is to be planned and coordinated, but not legislated.

I have at present seventeen Commissioners. They have been selected to be widely representative of the economy, both industrial and non-industrial. They have been drawn from the different areas of Canada and represent the two main language groups.

The first step of the Commission was to approach all the more significant trade and industry associations asking them to study the impact on their industries of metric conversion and to suggest a timetable most suitable to their particular conditions. It has also written to all Provincial Governments to inform them of the Commission's approach and to call attention to a number of areas which would appear to be primarily a provincial responsibility.

The Commission has established a number of steering committees, each responsible for planning and coordinating within a particular sector of the economy. These committees consist generally of two Commissioners as Chairman and Co-Chairman and a number of members invited from the major association or industrial groups forming part of the sector. These committees have been analyzing the replies received from the various associations and studying the most effective methods of planning for conversion in their economic areas.

It soon became obvious that the steering committees, each including a wide range of industries in their responsibilities, could only act effectively as coordinating bodies, and that actual planning would have to be done at a level much closer to the individual firm or industry. Accordingly, the Commission has set up in the area of each steering committee a number of sector committees, each based on a single industry or related group of industries.

These sector committees are drawn from major companies and industry associations in their sector. Each steering committee has assigned to it a permanent member of the Commission staff as Sector Plan Manager; this officer is responsible for assisting in the organization of the sector committees and arranging for the prosecution of their work.

The first task assigned to the sector committees is to determine the metric units which are to be used by the industry. While all industries are expected to make use of metric units forming part of the SI system as adopted as a National Standard of Canada, Can-3-001-01-73, each industry may wish to select those units appropriate to its use and it is most desirable there be industry agreement on those units.

The committees are then asked to recommend priorities for the standards writing bodies in producing the metric standards necessary for conversion. They are also asked to recommend priorities in the revision of legislation and regulations by public bodies consequent on metric conversion. Much legislation and regulation specifies requirements in customary units only and must be revised to permit proper metric conversion.

With these preliminaries out of the way the committees will be in a position to start on the specific conversion plan for their industry. These plans will only be guides, for each firm will finally be responsible for selecting its own time and program for conversion. However, the industry consensus on the time limits within which each step should be taken will be a valuable guide to the individual firm and will enable planning to be coordinated between different industries and economic areas. This coordination is most important to ensure that suppliers and customers are in phase with the industry program, ready to supply metric material or receive metric products when required. The coordinating responsibility lies with the steering committee for its economic area and with the Commission itself for overall planning.

Within the federal government each department has to assume responsibility for examining its own operations. All measurement sensitive activities have to be identified and the necessary plans made for conversion. High priority has been given to review of legislation and regulation to identify all clauses which are measurement related and which may require amendment. The volume of this work will be considerable and careful study is needed to prepare necessary legislation in the most suitable form and to plan for the requisite legislative time. Obviously priority must be given those acts whose provisions would make impossible the adoption of suitable metric sizes. The requirement of prescribed weights for the sale of some food commodities is an example.

Government operations have a substantial impact on the general economy and in turn are affected by changes in the economy. Neither the public nor the private sector can operate as an island to itself. The Commission has, therefore, asked those departments concerned with the areas of responsibility of particular steering committees to nominate officers to act as advisers to those committees. These officers provide a direct channel of communication between their departments and the Commission. Similar arrangements are being made for the sector committees as the need arises for communication from either party.

The Commission has allocated an officer with responsibility for maintaining intergovernmental liaison and each provincial government has designated an officer through whom communications to and from the Commission can be channelled. The Commission has arranged to send to provincial governments through these designated officers copies of minutes of all steering committees so that these can be furnished to interested departments.

Planning for conversion in industry is only part of the Commission's task. If metric conversion is to be effective in Canada it must be prepared for by education and supported by a public information

program. Metric conversion is going to affect the individual citizen in his daily life; he must be enabled to understand what it is all about, why it is happening and what are the changes that he is going to have to meet.

Education in the formal sense is a provincial responsibility. The Commission's task is to provide the information that will enable the provinces to coordinate their planning. Children now entering primary schools will graduate in twelve years' time to a metric working world in which they will not need to make any use of imperial units. Children now moving to the secondary level will have to have competence in handling both measurement systems. At the level of vocational training and adult education the immediate requirement is still for measurement in imperial units but the opportunity for metric instruction should not be foregone. Clearly the situation calls for careful planning of the necessary changes in instruction.

Technical institutes and community colleges have an opportunity for service to their communities in providing courses in metric for people in industry who require a more comprehensive knowledge than can be acquired in training on the shop floor or in the office. I have in mind designers and draughtsmen, shop supervisors and others at a similar level. We have already had discussions with individual colleges looking to the development of model courses.

The Commission is working on a long term program of public information. We expect to be making use of all media of communication, press, radio, T.V., film, audio-visual, talks, exhibits. The program has to be planned to conform to the developments in the process of conversion. We see this as involving four phases - investigation, planning, scheduling and implementation. Each phase will reach a peak of activity then decline to be succeeded by the next phase. Each phase will require a different emphasis in the public relations program so that the public is informed of what is going to happen and why, but not stirred up too early then let down by an apparent lack of activity while the main emphasis is still on planning and scheduling.

Industry, government and the people of Canada want to know what is the objective of the Commission for making metric conversion effective. There are obvious advantages to both Canada and the United States in programs for metric conversion that are reasonably coordinated. The Commission has been watching the progress of legislation through Congress to approve a program for voluntary metric conversion. However, industry in the United States is moving on a broad front to implement conversion programs without waiting for the passage of legislation. The Commission now feels that Canada can plan her program with assurance that a similar change is coming in the United States. It is accordingly preparing a recommendation to Cabinet for approval of guideline dates for a Canadian program which will best serve Canadian interests in relation to developments in the United States and the rest of the world.

In the meantime all our committees are at work and already a few significant plans are appearing. We hope to start converting weather reporting to the public in 1975. Tentatively we will start with temperatures in degrees Celsius in April 1975, to be followed a few months later by precipitation and snowfall in millimetres, and later by wind speeds in kilometres per hour and visibility in kilometres. The grain handling industry is planning for conversion during the crop year 1976-77. The provincial highways departments have developed a plan for conversion of all factors involved in highways over the period 1975-1979. This includes changing speed limits and road signs in a coordinated program in September 1977. Hospitals are far advanced in their internal conversion and pharmaceuticals such as toothpaste are now being sold in metric sizes.

Changing the measurement system of a whole society is a radical process. It compels an examination of many practices embedded in the life

of the community. We may accept the long term benefits of change to a logical, coherent system of measurement and to one that is becoming a truly international language; but we may still be appalled at the apparent problems of change. In truth these problems are better seen as opportunities, opportunities to re-examine and improve practices and procedures, opportunities to rationalize and standardize products, a chance in a lifetime to clean house and eliminate deadwood. Not only does the goal justify the journey, but the journey itself is a challenge of opportunities.

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