

THE INTERNATIONAL CHARTING PRINCIPLES BEHIND TECHNICAL RESOLUTION B 10.1

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MEANING OF THE RESOLUTION

The intention of the U. K. in its original resolution at the Tenth International Hydrographic Conference, as reproduced in the Red Book, was that in the study of international charts on medium and large scales a similar approach be adopted to that of the Commission on the International Chart on small scales, modified as appropriate. This approach was endorsed by both the Charts Committee and the full Conference in adopting Resolution P 29 (Technical Resolution B 10.1) as reworded by the special sub-committee appointed for the purpose. The key words are :

“ The aim of the study would be the production of a set of charts suitable for the needs of international shipping ... Such international charts would enable those IHO Member States who provide, or wish to provide, charts outside their own national waters, to print by facsimile with minimum modification, selected modern charts.”

The object of this paper is to elaborate the ideas underlying the Resolution, in response to which the North Sea International Chart Commission was subsequently established, charged with carrying out a pilot study on behalf of the IHO in order to establish principles which could be applied worldwide not only to the production of international medium and large scale charts, but also to other important aspects such as their maintenance in an up-to-date condition.

FUNCTION OF NATIONAL CHART SERIES

It is necessary first to be clear about the function of national series of nautical charts. The U.K.'s own experience, and a careful examination of foreign chart catalogues, suggests that these charts have two functions :

(a) *Marine Navigation*. Hydrographic Offices appear to have an obligation to provide nautical chart cover of their national waters

to such an extent, and on such scales, as to permit safe navigation for all classes of vessel, from the smallest to the largest, throughout coastal waters, including both major ports visited by the largest vessels, and minor arms of the sea of purely local interest. In this, the best known sense, nautical charts are navigational tools.

(b) *Information Sources.* National nautical chart series are usually the largest scale publications available showing the detailed configuration of the seabed offshore. In this respect Hydrographic Offices have a *de facto* responsibility for their national waters similar to that of topographic mapping agencies. Such information about the shape of the seabed is required by a variety of national users other than navigators: defence departments, constructional engineers concerned with offshore developments, dredging contractors, oceanographers, and so on.

The combined effect of the two requirements has caused national chart series to cover national waters in great detail, as regards the very large scales used for port plans, the relatively large scales used to give continuous coastal cover, and the existence usually of at least two continuous coastal series — the second on a medium scale — with a comparatively small difference in scale between them. But ships using national chart series, whether flying national or foreign flags, do not necessarily use every large scale sheet along their tracks. Coasting along the south coast of England for example, the 1/150 000 second scale cover is often preferred to the 1/75 000 series — thereby the number of charts in use is reduced, and also the number of position transfers between sheets. There would be little point, either, in a ship following a coastwise track which sometimes lay on the 1/75 000 series, sometimes off it, transferring to and from that scale unless it was navigationally imperative, as when approaching a port the waters of which are of such a complexity as to demand that the larger scale be used. Indeed, for modern deep-draught vessels, such a procedure could create a potentially dangerous situation. For radar matching purposes, too, and when using aids such as radiobeacons, it may be better, other things being equal, to use the second scale sheets, which show more coastal and topographic detail ahead and astern of the ship.

It might be thought that the arguments just stated are at variance with the time-honoured adage "Always use the largest scale chart available". This is, however, a rule-of-thumb, relating to world chart series such as the Admiralty series, and takes no account of the fact that national Hydrographic Offices chart their areas of primary responsibility over-generously as regards most of the requirements of modern navigation. The adequacy of the French and German continuous coastal series of the south coast of England — neither needing to serve as general information documents, nor to cover in detail all the minor waters of the U. K., and both representing a practical response to the navigational realities which have been described — is clear proof that the principle should instead be "Always use the largest scale chart provided for the purpose."

THE CONCEPT OF INTERNATIONAL MEDIUM AND LARGE SCALE CHARTS

France and Germany are shipping nations, and both, in addition to their own very detailed national chart series, publish numerous sheets to provide cover, in their own languages — a fact very important to maritime safety — of much of the world. By tailoring, in the same way as on the south coast of England, all those parts of their series which cover foreign waters — where visiting French and German ships are in the role of “international” shipping — they are able to keep the total sizes of their world chart outfits within manageable limits. Another device used to this end is the omission or simplification of inshore detail not likely to be of interest to visiting foreign ships — German charts 901 and 902 of New York harbour are excellent examples of this. The use of smaller scales for charts of harbours and their approaches is permissible in pilotage waters; once the pilot is embarked the ship’s master’s use of his own chart — still preferably in his own language — is reduced. Such principles as these are also observed in the three-quarters of the Admiralty’s 3 300 charts which lie outside the U.K.’s areas of primary charting responsibility. It has been estimated that to give similar worldwide cover, no less than 10 000 sheets would need to be selected from national series : a world outfit of formidable size.

A corollary of the limitation, by the means described, of the size of such world chart outfits, is the restriction outside national waters of the system of Notices to Mariners (NMs), by which they are kept corrected, to items which are essential to the foreign shipping using the charts. Minor changes, either of purely local navigational interest — like buoyage in yachting harbours — or those required to keep the record of information straight without materially affecting navigation — such as the labelling of a submarine cable as “disused” — are omitted. Thereby, the number of French or German or British NMs is kept within limits, and the maintenance of the whole chart outfit in an up-dated state is practicable. Language differences apart, the use of national NMs by foreign-going ships to keep charts across the world up-to-date is virtually impossible on grounds of numbers alone. For example, in 1972 France issued 2902 chart-correcting NMs, Germany 4950, U. K. 2383 (the differences to some extent reflecting variations in the number of items included in each notice). At the same time, 19 of the 44 members of the IHO, for whom figures were available, grossed 9533 NMs in 1972, in 8 different languages, an average of some 500 per country. Using this average over all 44 IHO members, the annual total would be 22 000. As examples of selection within the North Sea and English Channel area, in 1972 France issued 59 NMs for her north coast, but Germany only 28 and U. K. 16 for the same waters; Netherlands issued 310 NMs for her waters, the corresponding numbers from France, Germany and U. K. being 62, 153 and 62; 194 Hamburg notices related to German North Sea waters, but there were only 43 French and 28 U. K. comparable notices.

Behind T. R. B 10.1 lies the concept of creating an international set of medium and large scale charts on the principles just described, from which all nations who wish to do so can benefit — namely, “to enable those IHO member states who provide or wish to provide, charts outside their national waters, to print by facsimile with minimum modification selected modern charts”. The intention of the Resolution was that IHO members would share the task of making reproduction material available, and keeping it up-dated, for this purpose, so as to produce two major advantages :

Firstly, to allow countries which do not print charts and issue NMs outside their national waters at present to do so, in their own language, and with their own modifications of style if desired; 26 countries have already stated a wish to do so;

Secondly, by sharing the effort, to make it easier for all countries to keep their charts of foreign waters up-dated, and thereby to use their resources with greater efficiency.

The degree to which individual Hydrographic Offices will be prepared to provide productive effort will depend naturally on their assessment of the advantages to them of being able to print international medium and large scale charts of chosen areas.

The main features of the international chart concept of T. R. B 10.1 may therefore be summarised as follows :

(a) A compact set of medium and large scale charts, of approximately 3 000 sheets covering the world, on scales adequate for coastal navigation and access to international trading ports;

(b) A concise system of Notices to Mariners, about 3 000 to 4 000 per annum, to maintain the world chart outfit for changes essential to international shipping;

(c) The production and exchange of reproduction material so as to enable any IHO member to print with the minimum of effort his own versions of international charts outside his national waters, modified as necessary to conform to the rest of his national series.

Overall, this concept seeks to extend, to the mariners of more nations, the security inherent in carrying, both in their national waters and outside them, a uniform set of charts, moderate in number, compatible with the style of the national series to which they are accustomed, printed in their own language, and corrected by NMs in their own language.

CAN THE IHO LEARN FROM INTERNATIONAL AVIATION ?

The suggestion has been made that the hydrographic world should see what can be learnt from international aviation, namely the aeronautical charting system of the International Civil Aviation Organisation (ICAO). ICAO has, over a long period, issued detailed specifications in order to standardise and integrate the aeronautical chart series of its member nations.

A study has therefore been carried out of the relevant publications of ICAO, supplemented by information provided by the U. K. civil aviation authority and by operators. The following main points emerged from the study :

(a) ICAO has a much larger budget than the IHO (11 million U.S. dollars in 1972) hence it presumably has greater resources at its disposal.

(b) ICAO Standards and Recommended Practices and its Aeronautical Chart Manual are matched by the Resolutions of the IHO, supplemented in the latter's case by national manuals and codes of practice, reflecting the different origins of the two organisations : ICAO was created to fill a void, while the IHO is an association of Hydrographic Offices, some antedating it by over a century.

(c) Despite ICAO's centralising influence, sheet limits are not yet co-ordinated between member countries, and some countries have found it necessary to introduce additional official air chart series.

(d) ICAO rules out hand-corrections to air charts : replacement of the most frequently corrected types is facilitated by their simplicity and cheapness of reproduction. Despite ICAO's centralising influence, charts vary in quality between countries. More attention is paid to up-dating air information, mainly pre-determined items consisting of straight-line and point details, than to topographic changes. Compare the very different correctional needs of Hydrographic Offices, constantly affected by spontaneous hydrographic changes over wide areas, which they themselves have to detect and survey, and then promulgate by a variety of means according to their urgency. (Point (i) also refers).

(e) National aviation regulations control the carriage of air charts very loosely, and are not enforced; in practice ICAO charts are most often not used.

(f) Only national sales systems exist for ICAO charts; foreign sheets are not stocked. Compare the widespread sales organisations of certain Hydrographic Offices.

(g) ICAO charts are in practice found inadequate, and in U. K., and presumably other countries, independent agencies produce alternatives which are used in greater numbers. Indeed, such agencies seem to have come into being to perform the same sort of function as that of many Hydrographic Offices.

(h) Air Information Publications (AIPs), which appear to combine the contents of sailing directions, lists of lights, tide tables, lists of radio signals, and chart catalogues, commendably make use of monthly change pages. But again, they are only sold in the producing country, and compete with popular commercial versions.

(i) Notices to Airmen are mainly equivalent to temporary Notices to Mariners, and only a minority are for navigational changes. Dissemination to foreign countries is highly selective.

The overall conclusion to be drawn is that, with the exception of the correction procedure for AIPs, there is little for the IHO to learn from ICAO air charting procedures. It may be that the growth of major commercial alternatives, apparently better suiting users' needs, stems from the diffi-

culty experienced by a highly centralised cartographic controlling agency adequately to sense, or keep pace with, developing needs, whether international or national. The existence of 44 separate Hydrographic Offices within the IHO, each bringing its experience and expertise to bear in solving the hydrographic problems within its waters, confers a strength on the organisation which far outweighs the duplication at times involved. In the aeronautical charting world there is massive duplication of another kind — the existence of very expensive series of national military air maps, on which far more effort is often expended than on their civil counterparts. What seems clear is that the ICAO system is a response to a navigational and cartographic problem very different from that facing the IHO, a response which like the IHO's has its full share of strengths and weaknesses. It may also be concluded that there is only a remote possibility of obtaining complete uniformity over a worldwide series of graphics which will be acceptable to users whose needs vary, in practice, along national lines.

RELEVANCE OF NATIONAL CHARTS AND PUBLICATIONS REGULATIONS

It is appropriate also to consider the possible effects on the international charting question of the Charts and Publications Regulations introduced in 1972 by Canada. These Regulations, which have been reproduced in the *I. H. Bulletin* and subsequently revised, have the result of making illegal the use of some of the medium and large scale charts published by foreign Hydrographic Offices. Because of their insistence that other agencies' charts of Canadian waters should not be used for navigation unless their scale is at least 75 per cent as large as that of the national equivalents, the Regulations would also have the consequence of precluding the use of International Charts produced according to the concept of Technical Resolution B 10.1. Such charts, as explained above, and as the North Sea International Chart Commission's study has already confirmed, may well be on scales with a difference of 50 per cent from the corresponding national chart scales, yet be entirely adequate for safe navigation.

The effect of such regulations, if applied universally, would apparently be to necessitate a reorganisation of the nautical charting activities of the IHO on ICAO lines — as conceived in theory, but not as has been shown fully realised in practice — wherein the only medium and large scale charts of any country's waters would be those of the national Hydrographic Office, and the universal intelligibility of all charts would be obtained, hopefully, by further standardisation within the IHO, supplemented by having textual matter on charts in more than one language. The concept of constructing a 10 000-chart world-outfit solely from national series, without the need for modified facsimile charting, presupposes stringent standardisation. Consideration of the areas of chart practice yet to be standardised, realisation of the rate of progress so far, recollection that each country's chart styles have gradually evolved and become familiar to its national mariners (some

Hydrographic Offices have already stated that they do not wish to diverge too far from their present specifications for medium and large scale charts) — all these factors suggest that it will be a very long time indeed before a multilingual legend will alone suffice to make all charts fully intelligible to all users.

The effect in practice of the approach inherent in the Canadian regulations would be to oblige mariners to use worldwide, for an indefinite period, a vast number of charts and NMs in 20 languages (used by the 69 authorities listed in the IHO Yearbook) — an arrangement which would reduce, rather than increase, the safety of navigation. For all the reasons given, it does not appear that the problems of the IHO would be solved if nautical charting were reorganised along the inflexible lines described.

CONCLUSIONS

The advantages have been set out above of creating a compact world outfit of medium and large scale charts, which can be printed by any nation which so desires, converting throughout to its own language, and making such stylistic changes as it deems necessary. This appears to be the most practicable solution, which could be achieved in reasonable time, if necessary without further standardisation, although more is of course desirable if the full potential of the concept is to be realised.

The U. K. itself has no objection, in the case of its own waters, to the use by mariners of selective chart series produced by other responsible Hydrographic Offices, the advantages of which it clearly sees, and would welcome the opportunity being provided, in accordance with T. R. B 10.1, for other nations to produce similar series in their own languages if they wish. The U. K. believes that it would be wrong for the IHO to allow itself to be influenced by isolated cases of restrictive national legislation when drawing up fundamental principles applicable worldwide to international charts on medium and large scales — although occasionally such legislation may introduce local complications in the application of the principles. U. K. considers, furthermore, that it is the duty of member offices of the IHO to do all they can, in the interests of the maritime community, to discourage their governments from formulating such regulations.

In the words of Technical Resolution B 10.1, the aim of the IHO should remain "The production of a set of charts suitable for the needs of international shipping ... Such international charts would enable those IHO Member States who provide, or wish to provide, charts outside their own national waters, to print by facsimile with minimum modification, selected modern charts".