PROGRESS IN ACHIEVING AN INTERNATIONAL SET OF CHARTS

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When representatives of 36 of the 41 Member States of the International Hydrographic Bureau met together at the 9th International Hydrographic Conference in Monaco in April 1967, one of the most important items among the 89 proposals which crowded their agenda was one dealing with the possibility of establishing an international set of charts.

The basic proposal had been jointly submitted by the Hydrographic Offices of France and the Netherlands in the following form :

> " It is recommended that a commission be set up to study the constitution of an international set of charts. This set should enable all the IHB Member States to print in facsimile all the charts required for world-wide navigation. "

Like all the other proposals for an international conference, this one had been circulated in advance to the Member States by the IHB, together with the explanatory notes of the proposers. Preliminary comments could then be printed and distributed for advance study by the delegations before they arrived in Monaco for the conference. Thus Argentina, Great Britain, Spain, the U.S.A., Germany, and New Zealand supported the suggestion, while Japan and Sweden, though agreeing in principle, considered that more preliminary work might be needed first. The IHB's own reaction was most cautious, with a feeling that the big step forward represented by this proposal was premature. The Bureau thought it might be better to await complete adoption of the metric system and then to approach the problem with a battery of commissions and sub-commissions, regionally and geographically divided, to work on specific aspects of the problem under the Bureau's overall coordination.

Once the world's hydrographers were assembled together in person, face-to-face in Monaco, however, the spirit of cooperation which has fortunately been a keynote of IHB relationships for almost 50 years soon proved its evidence again, for enthusiasm for making a start on this exciting prospect of true international cooperative sharing of the work of charting the world's oceans and seas was manifest.

France had explained the logic of such an approach, noting that it was already a fact that bi-lateral agreements existed between several nations whereby they could make facsimile reproductions of each other's charts.

The advantages of such arrangements could be extended and broadened to encompass an international set of charts so that any one nation would be able to avoid the extensive compilation and drafting work required to produce all of them individually. As an example, France noted that five Member States of the IHB each published its own chart covering the Mediterranean Sea (United Kingdom, Spain, U.S.A., France, and Italy) with only slightly differing scales, boundaries, and formats. In such a case it should be possible to derive a single chart to replace each of the five national products. The Netherlands noted that the situation in the North Sea was an even more striking example, with eleven nations each involved in publishing a chart to cover the entire North Sea, in most cases all copying portions or all of the charts from other nations'products.

The magnitude of the problems involved certainly did not escape the hydrographers in their discussions, yet they recognized that they were not trying to resolve all the possible questions involved at the moment — these would be tackled by the commission to be established, and it was rather readily agreed after some discussion that a single commission would be best to make the initial investigation. Further, to start carefully, the investigation should be limited to small-scale charts as a beginning — charts at scales smaller than 1/1 000 000 being specified. Recognizing the need to give careful guidance to the commission in order that it would accomplish the study desired, the members of the Charts Committee at the 9th International Hydrographic Conference extended to a second day their discussions on this proposal, so that appropriate Terms of Reference could be drafted and approved. These were accomplished overnight by the Chairman of the Charts Committee and Mr. RAASVELDT of the Netherlands delegation, taking into account all of the comments and opinions they had thus far heard. With some minor modification they were then adopted the next day at the second meeting of the Charts Committee as follows :

Terms of reference for the study commission on an international set of charts

1. This Commission will study the constitution of an initial increment of a possible international set of charts, confining their study to charts at a scale smaller than 1/1 000 000.

2. The Commission should :

a) Inventory existing small-scale charts to compare duplicating coverage issued by various nations;

b) Evaluate such charts for the degree of compliance with existing IHB Technical Resolutions;

c) Solicit information and make recommendations relative to the largest size chart which could be reproduced by any member nation;

d) Tabulate the specific items which appear on such charts which are not yet standardized by any Technical Resolution, submitting recommendations for further standardization where appropriate.

e) Suggest a specific producer nation and a recommended scale and area limit for any area studied;

f) Gather facts and opinions as to whether producer nations designated would be willing to provide reproduction material for facsimile printing without restriction to any IHB Member State or whether bilateral agreements would be necessary;

g) Determine whether centralized maintenance originated by the original producer nation or multiple separate national maintenance procedures would be better applied to :
   1) Immediate minor changes which would be the subject of Notices to Mariners;
   2) Larger changes which might dictate issuing a revised edition;

h) Study and recommend as feasible a system or method of numbering and designating charts in the international set.

i) Study and recommend the minimum number of languages which would be required for the title block, marginal notes, or other annotations in addition to the original national language in order for a chart to serve adequately as a true international chart; or, alternatively, recommend that a single language be used for the original version with translations accomplished by each reproducer as needed if this is a better solution;

j) Determine whether it would be feasible for the producing nation to make recommendations on areas within the limits of any chart assigned to it which appeared to require more adequate hydrographic surveys;

k) Make recommendations for the establishment of additional commissions to study further specific regional aspects of the subject when this appears to be desirable;

l) Submit periodic reports of progress to the IHB for circulation to Member States, with a final report to be submitted by 31 December 1968;

m) Examine such other matters which the commission considers of primary importance that arise during its study.

The Charts Committee then concluded its consideration of the proposal by recommending that the commission be composed of representatives of France, the Netherlands, the U.K., the U.S.A., Germany, and Japan, these being the nations with the greatest number of charts covering international waters. The six nations all agreed to serve on the commission.

At the concluding plenary session of the 9th Conference the proposal was formally adopted with approving votes from 33 Member States, and the suggestion that the United Kingdom undertake to get the commission organized and the work started was also approved. Subsequently by correspondence the IHB arranged for Rear Admiral G. S. RITCHIE, C.B., D.S.C., F.R.I.C.S., Hydrographer of the Navy of the United Kingdom, to serve as Chairman of the Commission. The six nations named their commission members to serve with Admiral Ritchie as follows :

France : Mr. R. BRIE
Netherlands : Rear Admiral Ir. W. LANGERAAR and Mr. H. ROMBACH
Germany : Mr. H. R. ERMEL
Japan : Mr. M. NAGATANI

U.S.A. : Mr. R. J. BEATON and Captain J. O. BOYER, USESSA
U.K. : Mr. L. N. PASCOE

By September 1968 enough preliminary study had been accomplished (primarily by Mr. Pascoe of the U.K.) to permit convening the first meeting of this Commission, and the occasion of the 12th International Congress of Surveyors (FIG) being held in London was seized as an opportunity, since many of the commission members would be attending this congress. Every one of the designated representatives was present and, in addition, all three members of the Directing Committee of the IHB were also able to attend as observers. The meeting was held September 10 and 11 in the office of Admiral Ritchie in the Old War Office Building in Whitehall, with Mr. D. RUSSOM of the U.K. serving as Secretary.

The first quite important result of the study undertaken by Mr. Pascoe showed that the various existing arrangements or schemes of small scale charting in use by the various nations were in no way coordinated ; that is, there was no similarity in limits or scales. This immediately ruled out the possibility of an easy solution of just selecting charts and " internationalizing " them to make up an international set. Instead there would be a need for a completely new unified worldwide set of small-scale charts. This development was not at all discouraging, in that it was recognized that there would be many advantages to a " fresh " approach. (The reason for differing approaches in existing charting schemes was given a rather interesting possible rationale by Admiral LANGERAAR, who observed that perhaps "international trade" was a misnomer — it might be more accurate to state that this was really *national* trade which extended overseas, so that each nation's approach in the part to meeting its wide ranging charting requirements had been slightly different.) There was little doubt, however, that today, with a new scheme of about 125 to 150 charts of closely standardized format, prepared by various IHB members, the needs of all could me met, each member being free to adopt any or all of the charts in the total scheme as needed.

Current information was exchanged on the way in which each of the six nations had thus far carried out on a bilateral basis their various facsimile reproduction agreements with other nations. There was strong concurrence on the savings of compilation effort achieved. As an example, the U.S.A. reported having 17 such agreements in force, under which a total of about 334 charts had already been reproduced, mostly large and medium scales. From the time reproduction materials of the foreign produced chart were received in the U.S.A., an average of only 3 or 4 weeks was required to make all modifications to conform with US requirements, prepare printing plates, and print the charts. The Netherlands only required two to three weeks to modify French charts for reproduction in their exchange agreement.

France brought out one difficulty, at the same time showing how readily it could be overcome. France uses a comparatively smaller format than the Netherlands, so, for example, where the Netherlands covered the approaches to and the navigable portion of the Meuse on just two charts, the French were forced to take the reproducible materials and cut them apart to make up three corresponding French charts for the same area.

The U.K. study had involved preparation of outline charts showing all existing charts of all nations for each ocean area (for charts at scales 1/1 000 000 or smaller). Copies of these indexes were provided to each delegation for retention and future study as a new worldwide common scheme was developed.

Another result of Mr. Pascoe's study was to show that, with respect to the degree of compliance by the various nations with the existing IHB Technical Resolutions governing nautical charts, there was little basis for discussion or argument. The reason was that the TR's applied primarily to items appearing on or connected with large-scale charts and very little guidance for standardization actually existed as yet for small-scale charts. The result was that there was a large degree of variation in the treatment of depicting depths, depth contours, light descriptions or characteristics, radio aids, magnetic information, and the nature of the bottom. Symbols used were generally standardized, but abbreviations, selection policies, and use of colour showed differences among nations. It became apparent that the Commission would have to develop a set of specifications for an International Chart at small scale, after which new Technical Resolutions for inclusion in the IHB Repertory could be suggested.

Considerable discussion had to be devoted to the question of chart sizes. Some nations, like Germany and the U.S.A., printed much larger charts than others. On the other hand, it might not be realistic to try to tailor the size of an international chart to the smallest size that would still permit any one of the 42 IHB Member States to reproduce it. A size would have to be determined that was believed to be most generally acceptable; then those nations which might not be able to reproduce a chart of the specified size would still be able to use the International Charts, but would have to rely on the printing capacities of other nations for the finished products. In some cases they might arrange for printing to be done by other facilities within their own country, using the reproducible materials provided by the producer nation. The U.S.A. and Germany both agreed that they would be willing to accept a format smaller than they normally used in the interest of this cooperative program. The initial conclusion reached was that charts should have a maximum printed paper width of 72 cm, trimmed size.

It was when discussion centered on the problem of the language in which an international chart should be prepared that the focus was really sharpened on the problems of the concept of an international program. Two distinct concepts were possible. On the one hand, there might be an ideal form which could be prepared by one nation and used by all other nations without any change; on the other hand there would be a basic format which could be modified as required by any member choosing to reproduce it. Extensive discussion resulted in recognition that the ideal was unattainable. It would only be feasible to have the program accepted and widely used if each nation producing a chart were asked to follow standard specifications, but to use its own national langage for all written text or words appearing on the chart; then any member reproducing this chart from the international set would translate into its own language or add English translations if that would suffice.

Some general discussion of minimum necessary standardization of symbols and abbreviations took place at this first meeting. But an important principle was recognized : that no country would be expected to make any radical changes in style for the full portfolio of its own charts, the recommendations for uniformity which would be developed being applied only to the charts constituting the international set.

Reverting to the problem of a new worldwide scheme, the Commission agreed that coverage at two scales, probably about 1/3.5 million and 1/7.5 million, would be required. Both the U.K. and the U.S.A. had developed suggestions for schemes and it was left to the U.K. to continue this study by correspondence.

Since it was quite apparent that the best way to make any real progress was to attempt to have a specimen chart as a talking point, the possibility of the production of a prototype chart for the international series was broached. Logically this might be one that covered some convenient unit of water area without having to be part of a series, and both the Caribbean and the Mediterranean suggested themselves. The Netherlands volunteered to undertake to prepare a prototype for the Caribbean and the IHB was asked to see if a Mediterranean nation would undertake the compilation for the Mediterranean. (Subsequently France agreed to accept this responsibility).

Some initial thoughts were expressed on problems which might be generated in the procedures for maintaining an international chart up-to-date through Notices to Mariners. It was agreed, however, that maintenance problems were actually not serious in the case of charts at the scales under discussion at present. It was unanimously agreed that the original producer should be charged with maintaining a master copy of the international chart, but it was recognized that detailed discussions on maintenance problems were premature at this stage.

With respect to numbering the charts of an international series, the Commission members agreed that each chart should be given an international number, preceded by the designation " INT ". Any nation reproducing the chart would be free to add a number in its own national series as appropriate, but should also retain the international number. It was also agreed that the IHB seal should appear on all charts in this series.

Being realists rather than merely conferees, the Commission members were not shy in tackling the very real problem of money. Should a charge be made for furnishing the reproducible materials ? Should royalties be paid to the producing nation when another nation reproduced the chart and sold copies ? From informal discussion of these points, it seemed to be the prevailing opinion that charges for the actual reproducible materials would certainly be logically subject to reimbursement. (If every one of the 42 Members States of the IHB were to reproduce the same chart, the producer nation would be faced with having to provide 41 additional sets of reproducible materials, in the extreme case.) Royalties, on the other hand, should be avoided, in the opinion of the Commission members, since there would be many administrative difficulties for such a system to operate. Two suggestions were considered : that a standardized price

might be set for the sale of copies (so that no one nation's copy of a practically identical chart would be underselling another's); or that a rule be established that no reproducing nation should sell reproductions for less than the price being charged by the original producer for his copies (as is the rule governing many existing bilateral arrangements already). Decisions on financial arrangements were set aside for further discussion, but there was a strong sharing of the opinion that the savings in lengthy and costly production time that would be gained from a cooperative effort would largely offset the other financial implications.

Six months later the Commission held its second meeting, gathering this time for three days in Monaco, March 10-12, 1969, at the headquarters building of the IHB. All of the Commission members except Mr. Nagatani from Japan (where distance proved too much of an obstacle) were in attendance, as well, of course, as the Directing Comittee and technical staff of the Bureau, as required. Furthermore, the Commission was able to make use of the extensive collection of nautical charts in the Bureau's archives for reference as discussions proceeded.

With the additional period of preparation permitting more detailed studies to be conducted, the subjects could now be addressed in far more concrete fashion. Again the face to face meeting reflected a most encouraging spirit of compromise and willingness to modify positions to take into account the opinions or the needs of other nations.

Probably the most positive forward step taken had been the surprising accomplishment of the Netherlands in having already produced for discussion an initial version of the prototype chart for the Caribbean. This was done at a scale of 1/4 200 000. Having copies of a specific chart, compiled according to the sense of the discussions of the first meeting, gave the delegates something very firm and real upon which to center their discussions of various points in refining the draft set of specifications tabled by the U.S. delegation for consideration.

First, however, the overall schemes for the two scales required were examined critically and modified. As an example of the kind of decisions required here : at the 1/7.5 million scale should the North Atlantic be covered by two sheets oriented with the long axis East-West (which would permit, for example, planning a voyage from the English Channel to New York on a single sheet, but require two sheets in the case of a route from the Channel to west Africa) or should the orientation of the long dimension be North-South, which would be better adapted for certain routes, but then would require two sheets for an Atlantic crossing ? Or, in such a case, should the international scheme provide a total of four charts, two oriented each way, since, once compiled it would be little additional work to re-format the work for production of the finished charts in another manner ? Here the results of discussions invariably led to decisions to keep the scheme adopted to the minimum requirements for world coverage, without excessive overlaps.

Once details of the proposed schemes had been accepted, it was possible to come to grips for the last time with the question of sizes, and the final decision here was that the neat line dimensions of the international chart series should be 98 $\times$ 65 cm, using paper no wider than 72 cm.

For certain areas, the standard scheme will not logically apply. Thus the Mediterranean, Black Sea, Caribbean, and the Red Sea would be considered as separate ocean areas to be charted uniquely in each case on a scale different than the standard 1/3.5 million.

The main part of this second meeting was devoted to achieving agreement on the details of the technical specifications which would govern the standardized international charts. This included such details as the ellipsoid and projection to be used, how the chart border will be subdivided and how often meridians and parallels would appear and be labeled, how charts will be numbered and dated by producers, what information should be shown in the title and such technical matters as the line weights to be used for contours, shoreline, etc., and what color for the land tint.

A particularly thorny question was that relating to whether depths shown in ocean areas should be corrected or uncorrected for the speed of sound in water. Recognizing that a truly scientific document would aim at showing the depths as precisely as they could be determined, but recognizing that a nautical chart is a tool for practical navigation by chart users who can only determine depths with ordinary fathometers, the Commission finally adopted this wording for the specification covering this point :

> " As it is of no practical significance to navigators and because it is often impracticable to accurately correct the soundings beyond the 200-metre contour for temperature, salinity, pressure, and slope, these would remain uncorrected, but they should be adjusted to a speed of sound in water of 1500 m/sec. "

In this connection, the Commission noted that it would be distinctly awkward to produce charts with a mixture of corrected and uncorrected soundings, that knowledge on which to base corrections is still in the process of being refined, and that, should corrected soundings be really appropriate for nautical charts at some future date, it would be far better to take the conversion step all at once, knowing then that none of the existing soundings had been corrected. (It was also recognized that this decision ran counter to an existing IHB Technical Resolution, so the Commission intends to recommend that the IHB reconsider TR B 185).

The specifications as developed also cover many other items, such as portrayal of dangers to navigation, lights, and radio beacons; size of compass roses; curves of magnetic variation; currents; quality of the bottom; limits of ice; and other topographic detail.

One subject requiring more than a little discussion, however, was that related to the geographic names that should appear on an international chart. Fortunately the IHB has been in the lead and mariners are generally ahead of landbased cartographers in becoming familiar with and using the names applied locally by the governments having sovereignty over the feature named on a chart. So the solution achieved here was based on principles already agreed by IHB Member States. How this is proposed to work deserves a bit of explanation, since sometimes the question of names can be a delicate matter. Suppose that Italy were to assume the responsibility for compiling the basic international chart for the western Mediterranean. On the basic black plate for the international version, to label the geographic

entity of France, the name " France " would appear (even though the Italian language has a separate word, " Francia " in this case). Then any nation obtaining the reproducible materials from Italy would be free to substitute their own national language version as an alternative. Even Italy, which had produced the basic international version, when it came to printing stocks for its own use, could take these same steps if it were desired. The obvious goal here, as elsewhere, is to create a basic product with the maximum potential for international usage. (Even with these possibilities for modification, it is believed there will be many nations who will find it quite feasible to accept the names as originally compiled by the producer and to reproduce the chart without modifying them at all).

The principle of a standard appearance was moved forward in the matter of typography when the United Kingdom offered to make available to other producers the basic typeset which was the result of an extensive study for legibility. (For the redraft of the prototype Caribbean chart which the Netherlands will now undertake to produce complying exactly with all the agreed specifications in detail, for example, the U.K. will fill the type order).

With tremendous progress already achieved, the Commission finally decided that one final meeting, to take place in September 1969 in London, will be required to complete their report and recommendations to the Bureau. From the manner in which the work has proceeded thus far, there is indeed cause for much optimism that an international series of standard charts at small scale will come into existence in a very few years'time, to the benefit of both navigators and those charged with producing the charts they require.