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Report of ICNAF Working Group on Mesh Problems
London, 21-23 November 1966



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Introduction

1. The Working Group was established at the Commission's 16th Annual Meeting in Madrid in June 1966, with the following terms of reference

"to study the whole question of mesh definition and method of measurement in the light of further discussion in NEAFC of international inspection arrangements with a view to further consideration being given at the 17th Annual Meeting to the question of adopting a single gauge of uniform application".

2. The Commission had decided that all member countries which wished to do so could participate in the meeting. In the event, representatives from ten member countries attended (Canada, France, Federal Republic of Germany, Iceland, Norway, Poland, Portugal, UK, USA and USSR). A list of those present is attached as Appendix I. The Executive Secretary of ICNAF was prevented by a Canadian airline strike from attending.

3. The Working Group met at the offices of the Ministry of Agriculture, Fisheries and Food, Whitehall, London, from 21-23 November 1966. Mr Aglen (UK) had been asked to take the chair and presided. Mr B.B.Parrish (UK) was appointed Rapporteur.

4. The draft agenda, circulated by the Executive Secretary on 1 November was considered. It was agreed that items 7 and 8 should be changed to read as follows:-

7. Mesh differentials for different materials
8. Mesh size equivalent for different gauges

The revised agenda is attached at Appendix II. It was agreed, however, that the order in which the items would be taken would be at the Working Group's discretion.

5. At the opening meeting the Chairman circulated a background note, attached as Appendix III, summarizing the relevant recommendations of the Commission and other related matters. The Chairman drew attention in particular to the desire frequently expressed in Commission meetings that there should be a standard method of mesh measuring on both sides of the Atlantic and one which would give uniform results in the hands of different operators. This had led to close collaboration between the Commission and the North-East Atlantic Fisheries Commission (NEAFC) which had been considering similar problems especially in relation to the proposals for international control arrangements. The Working Group took note that at its special meeting the previous week, NEAFC had not completed consideration of the proposals for international control which would be considered further at its next meeting in May 1967. The Group also noted that while it was accepted in the NEAFC discussions that a single standard mesh measuring instrument or gauge was desirable for international control, it had been suggested that for this purpose it would be more satisfactory to adopt a gauge which was acceptable to the courts of member countries, and thus enable reports by international inspectors to be used in court proceedings, even if the gauge did not produce entirely uniform results, than to use a more precise instrument such as the ICES gauge which was unacceptable to the courts in some countries because it incorporated a spring-loaded mechanism. In this connection it had been suggested by the United Kingdom that a modified version of the simple NEAFC flat gauge should be used incorporating both parallel-sided sections (capable of being passed easily through legal meshes in conformity with the NEAFC recommendations in force) and also wedge-shaped sections capable of measuring the width of meshes whether above or below the appropriate prescribed minimum. It had transpired that in fact several member countries of NEAFC used such a gauge for their national enforcement of the NEAFC recommendations. It was however noted that the USSR used a simple wedge-shaped gauge inserted vertically in the meshes under a uniform pressure applied by a prescribed weight, for enforcement of both ICNAF and NEAFC recommendations and that the USSR preferred this instrument to that proposed by the United Kingdom.

Mesh definition

6. The Working Group turned to considering item 5 of its agenda "Definition of Mesh Size". It was noted that the recommendations of both ICNAF and NEAFC defined the minimum mesh size by reference to measurement by a defined gauge. Several representatives thought it desirable, if possible, to separate the question of mesh size definitions from that of the method of measurement. It was agreed that theoretically the definition of mesh size should be on the following lines

"the inside distance between the diagonally opposite knots in the same mesh when the mesh is extended horizontally so that the strands of twine joining the knots are straight and lie parallel but are not stretched elastically."

The magnitude of the mesh size defined in this way could be determined by simple linear measurement. On the other hand it was recognized that in practice it was extremely difficult to define a uniform manner in which a mesh or meshes should be handled so as to conform to the state described in the definition above. This difficulty had been surmounted hitherto by combining the definition of mesh size with the method of measurement. The Working Group came to the conclusion with some reluctance that for the time being no other way of overcoming the difficulty could be suggested.

7. In the course of discussion the view was expressed that member Governments were not obliged in enforcing the Commission's recommendations to use the gauges specified in those recommendations; and it was noted that both in the ICNAF and NEAFC areas several member countries did not in fact use methods strictly conforming to the regulations. On the other hand the general view of the Working Group is that in order to ensure uniform enforcement of regulations it is most desirable that member countries should use only the gauges specified in the recommendations or approved under them and that it is accordingly very desirable to secure that gauges specified or approved are acceptable in practice.

Mesh gauges

8. For the reasons mentioned in paragraph 6, the Working Group felt bound to consider the question of mesh size in conjunction with the method of measurement and continued its search for a uniform method of measurement. Accepting that for the time being spring-loaded gauges were unlikely to be universally acceptable in court proceedings, the Working Group felt obliged for this reason to set on one side the ICES gauge and what has come to be known as the standard ICNAF gauge which also incorporates a spring-loaded mechanism. It considered instead both the USSR wedge-shaped gauge and the modified NEAFC gauge mentioned in paragraph 5 above. Specimens of both these gauges were examined by the Working Group.

9. The representatives of the USSR explained the manner in which the first of these gauges is used. The net to be measured is held loosely in a horizontal position and the gauge inserted into a mesh from above; a weight of 5 kg is then attached; the mesh is then held by the two outside knots and the width noted when the gauge has settled in equilibrium. It was explained that as this gauge is wedge-shaped with the taper prescribed in the ICNAF recommendation and is applied with the prescribed pressure, its use conforms to the specifications laid down in the recommendations and in the opinion of the USSR it can properly be described as an ICNAF gauge. It was further explained that in practice this gauge is frequently used to test the meshes of a net without the weight attached, in which case the net need not be held in a horizontal position. Testing in this way can be done more rapidly; if it reveals that the average size of tested meshes or the proportion of meshes which are near or below the prescribed minimum suggest that there is an apparent infringement, then a more thorough examination is carried out in the manner described above with the weight attached. The measurement of 50 meshes in this way may, however, take from 20 to 30 minutes to complete. It was stated by the USSR representatives that the same gauge is used in the same way in the USSR for the enforcement of regulations in the NEAFC area. Some members of the Group considered that the use of a wedge-shaped gauge was incompatible with the present NEAFC regulations and that if this USSR gauge were adopted as standard throughout the North Atlantic those regulations would have to be altered. The majority, however, did not feel that there was any incompatibility.

10. The method of use of the modified NEAFC gauge was also explained. As proposed in the recent NEAFC discussions, this gauge would be used without any prescribed pressure or the attachment of a weight, it being left to the judgment of the inspector how much force to use. The parallel-sided sections of the gauge represent the simple NEAFC gauge and can be used to test meshes in strict conformity with the NEAFC regulations; the wedge-shaped sections can be used to measure the meshes. It was agreed by the Working Group that if this gauge were used with a prescribed weight attached, its wedge-shaped sections (having the taper prescribed by ICNAF recommendations) would measure the meshes in exactly the same way as the USSR gauge and that it too would conform with the ICNAF specification. Some members of the Group felt that this gauge alone (when used with a weight) conformed with both the ICNAF and NEAFC recommendations in their present form. Others, however, felt that the inclusion of parallel-sided sections in the gauge and the need to have separate parallel-sided sections for each minimum mesh (of which there were a dozen or more in the North Atlantic as a whole) made this gauge unnecessarily complicated.

11. In the light of the preceding discussion the Working Group considered that the USSR gauge provided the best basis for a uniform standard mesh measuring instrument, the use of which would be simple and easily understood by fishermen. As already noted, it conforms with the specifications in ICNAF recommendations, in force or pending. The Group agreed to recommend to the Commission that it should consider the adoption of this gauge as the standard gauge for inspection. As, however, most member countries have had no experience of its use in practice, the Group consider that before it can be adopted as the standard gauge to the exclusion of all others in the ICNAF area, further study of the use of the gauge should be carried out by member countries and the Research and Statistics Committee in cooperation with the Liaison Committee of ICES. Such study should include *inter alia*

- (a) The angle of taper of the gauge;
- (b) The appropriate weight to be attached to the gauge to achieve a pressure which gives results corresponding as closely as possible to the use of a flat parallel-sided gauge passing easily through a mesh; and
- (c) Tests of the gauge in comparison with other gauges in use from the practical and scientific points of view.

The Working Group recognize that in examining meshes with the NEAFC gauge to see whether it passes easily through, inspectors may use varying pressures for different types of net; and that accordingly it may be found in the proposed study that more than one weight is needed to produce corresponding results.

In addition the Working Group recommends that the Commission should consider the possibility of giving manufacturers of nets guidance as regards the measuring of nets; in this connection the certification system established in the USA should be studied.

12. In making these recommendations, the Working Group has kept in view the objective of introducing a single standard mesh measuring instrument throughout the North Atlantic. It recognizes that the adoption of the USSR gauge for this purpose would need to be considered by the NEAFC and it hopes that the closest collaboration with that Commission will be maintained and that so far as possible arrangements may continue to be made for the joint study of common problems at scientific and other levels.

Method of measuring nets

13. Consideration was also given to the other aspects of the method of mesh measurement, *i.e.*, the manner in which the mesh gauges should be used for net inspection. At present the ICNAF regulations prescribe that measurements should be "the average of any fifty consecutive meshes running parallel to the long axis of the codend, beginning at the after end of the codend and being at least ten meshes from the lacings or, if the codend is less than 50 meshes in length, the average of the measurements of the meshes in any series of consecutive meshes running the full length of the codend."

It was pointed out that the number of meshes which needs to be measured to reflect the average mesh size of the net is a function of the variability in mesh size over the codend. This differs widely between machine-made and hand-braided nets, between nets made of different materials and runnages, and for different parts of the codend. While for some machine-made nets, a satisfactory result can be obtained by measuring 20 meshes rather than the 50 prescribed by the regulations, this is not likely to be the case for many hand-braided nets especially those made from natural fibres.

In the light of these considerations, and the desirability of maintaining a uniform system of measurement, the Working Group considers that the above specification of the method of taking the measurements and their number is a satisfactory one and is not therefore in need of change in the regulations at the present time. It recommends, however, that in its study of the USSR and other gauges, as proposed in paragraph 11, the Research and Statistics Committee give consideration to the question of possible reduction in the number of meshes which should be measured.

Mesh Size Differentials and Mesh Size Equivalents

14. The Working Group noted that the Commission at its 1964 Annual Meeting had prescribed differential mesh sizes for different groups of trawl materials and for seine nets in the 114 mm (manila) mesh regulations then in force or pending, for all of its subareas. At that meeting it had also approved the use of the ICES and simple NEAFC flat gauges as alternatives to the ICNAF gauge for enforcement purposes, and had prescribed mesh size equivalents for the ICNAF and alternative gauges. These mesh differentials and mesh size equivalents are set out in paragraph 3(v) of Appendix III. At its meeting in 1966, the Commission had reaffirmed its approval of these alternative gauges subject to review in 1967. The Working Group agreed that if a single standard gauge is adopted by the Commission, then the question of mesh size equivalents for alternative gauges will no longer arise. In the hope that this position will eventually be reached, the Working Group does not feel it necessary for the Commission to consider any radical revision of the present provisions for the time being.

The view was, however, expressed by some members of the Working Party that since neither the ICES nor the simple NEAFC gauges are used for inspection and enforcement in the ICNAF Area, they should not be retained as approved alternatives. This applied especially to the simple NEAFC gauge, which does not permit the measurement of the actual mesh size, and hence the determination of an average size, as prescribed in the ICNAF regulations. It was finally agreed, however, to recommend to the Commission that for the time being the ICES gauge, which is recognized as the standard gauge for scientific purposes on both sides of the Atlantic, should be retained as one approved alternative and that the modified form of the NEAFC gauge (as outlined in paragraph 4 of Appendix III) should be approved in place of the simple NEAFC gauge as the other alternative.

15. With regard to mesh size differentials for nets made of different materials, the Working Group was reminded that some member countries had on several occasions advocated that in order to simplify the regulations and their enforcement these differentials should be eliminated and that the regulations should prescribe a single mesh size for nets made of all materials. Other member countries, however, had attached importance to the retention of differentials which reflected the different selectivities of nets made of different materials based on the results of scientific investigations. The Working Group regarded this question as a matter of policy on which it could not usefully advise the Commission. So long as differentials are retained, the Working Group considered that their magnitude should continue to be determined by the results of scientific investigations on which information and advice is presented to the Commission by the Research and Statistics Committee. It did not feel able therefore to do more than recommend that the differentials approved by the Commission should be kept under review by the Research and Statistics Committee.

16. In its consideration of the problems of mesh differentials and mesh size equivalents, the Working Group noted that these had not been prescribed for the new 130 mm mesh size recommended for Subarea 1 as from 1 June 1967. If the Commission decides to retain differentials, the Working Group recommends accordingly that the Commission should approve such differentials at its meeting in 1967 and that with this object the Research and Statistics Committee should be asked at its next

meeting to prepare a table of equivalents similar to that set out in paragraph 3(v) of Appendix III to this report but related to manila trawl nets with a mesh of 130 mm instead of 114 mm. The Working Group expresses the hope, however, that in order to secure as much uniformity as possible, any differentials in Subarea 1 and Region 1 of NEAFC should conform as closely as possible.

Conclusion

17. The Working Group recommends that this report should be circulated as soon as possible so that all concerned may take it into account in preparing for the Commission's next meeting. It also recommends that copies should be made available to NEAFC and that copies should be sent to members of the Liaison Committee of ICES before its meeting in February 1967.

ICNAF Working Group on Mesh Problems
London, 21-23 November 1966

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AGENDA

1. Opening by Chairman
2. Selection of Rapporteur
3. Adoption of Agenda
4. Report of Special NEAFC Meeting on International Control, 15-18 November 1966
5. Definition of mesh size
6. Method of mesh measurement
7. Mesh size differentials for different materials
8. Mesh size equivalents for different gauges
9. Other business
10. Approval of Report
11. Adjournment

(v) At its meeting in 1963, ICNAF noted that the courts in certain countries had been unable to accept evidence based on the use of spring-loaded gauges in enforcement proceedings before them. At its meeting in 1964, the Commission (on the basis of the recommendations made by the Working Group on Chafing Gear and Mesh Measuring Problems endorsed by the *ad hoc* Committee on ICNAF Trawl Regulations) recommended the following changes in the regulations for all subareas, in force and pending:

- (a) that the minimum meshes prescribed should relate to trawl nets made of manila;
- (b) that on the basis of scientific advice as to selectivity equivalents, the Commission should be enabled to determine the appropriate mesh sizes when trawl nets made of material other than manila are used or when seine nets are used; and
- (c) that on the basis of scientific advice, the Commission should be enabled to approve not more than two gauges alternative to that prescribed in the regulations, by defining the gauges together with approved methods for their use and accepted scales of equivalent mesh dimensions.

At the same meeting the Commission decided that when the above-mentioned recommendations enter into effect, the following mesh size equivalents be adopted for materials other than manila, and for the different methods of measurement indicated.

Type of Net	ICNAF gauge	ICES and simple gauge
Seine net	100 mm (4 in)	95 mm (3 3/4 in)
Such part of any trawl net as is made of cotton, hemp, polyamide fibres or polyester fibres	105 mm (4 1/8 in)	100 mm (4 in)
Such part of any trawl net as is made of manila or any other material not mentioned above.	114 mm (4 1/2 in)	110 mm (4 3/8 in)

It may be noted that the Working Group mentioned above recommended that the two alternative gauges which the Commission might approve were the simple flat gauge as specified by NEAFC and the ICES gauge, and that accordingly the simple gauge mentioned in the table above must be taken to mean the NEAFC gauge.

- (vi) At the ICNAF meeting in 1965, the possibility of uniform minimum mesh requirements for trawl fisheries in the North Atlantic was discussed and the Commission agreed that a standard mesh measuring device for both ICNAF and NEAFC was desirable. The Commission was informed that mesh problems were being considered by a Special Committee of NEAFC on International Control and that arrangements would be made for those countries which were members of ICNAF but not of NEAFC to take part in the Special Committee's work. At its meeting in 1966, ICNAF was informed of the progress made and of the special meeting of NEAFC to be held in the autumn of 1966 to give further consideration to the question of International Control.
- (vii) At its meeting in 1966, the Commission took note that the recommendations mentioned in (v) above had taken effect in Subarea 5. At that meeting, the *ad hoc* Committee on Trawl Regulations considered whether as a result of this any further action on the part of the Commission was needed to implement the recommendation particularly with reference to the alternative gauges. This led the representatives of one country to say that it could not accept the use of

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BACKGROUND NOTE

1. The terms of reference set out in the Executive Secretary's note of 1 November 1966 make it clear that the Working Group is to study the whole question of mesh definition and method of measurement in the light of further discussions in NEAFC of international inspection arrangements so that the Commission may consider further at its next meeting the question of adopting a single gauge of uniform application.
2. The setting up of the Working Group arose out of the discussions of the *ad hoc* Committee on Trawl Regulations during the 16th Annual Meeting in Madrid. Among the questions referred to the Committee was the general question of mesh measuring, a subject which had figured on the Commission's agenda for several years. As the notes on the Agenda for the Madrid Meeting put it "for some time the question of a standard mesh measuring device which would be simple and satisfy scientists, inspectors, the courts and the fishermen has been before the Commission".
3. The background to the question before the Working Party may be summarized as follows:
 - (i) the original trawl regulations recommended by the Commission, first for Subarea 5 and later for the other subareas, prescribed that meshes were to be measured with a flat wedge-shaped gauge having a taper of 2 cm in 8 cm and a thickness of 3/32 in or 2.3 mm, inserted into the meshes under a pressure of not less than 10 lb or 4.5 kg nor more than 15 lb or 6.8 kg (Note: the first regulation for Subarea 5 recommended in 1952 prescribed a pressure of twelve pounds *simpliciter* but this was altered the following year to prescribe a pressure in the range 10 to 15 lb).
 - (ii) What has become known as the standard ICNAF gauge conforming with the Commission's recommendations is a spring-loaded wedge-shaped gauge designed to ensure that when it is inserted in a mesh it is inserted with a transverse pressure in the range 10 to 15 lb (4.5 to 6.8 kg).
 - (iii) In the North Eastern Atlantic the gauge prescribed by the London Convention of 1946, and by the regulations inherited by the North-East Atlantic Fisheries Commission (NEAFC) when it was set up under the Convention of 1959 is a flat gauge 2 mm thick of the appropriate width (*i.e.* appropriate to the particular prescribed minimum) which will pass easily through the mesh when the net is wet. It may be noted that this gauge does not measure the width of a mesh but merely determines whether it is at or above the minimum prescribed or below it. Nor do regulations prescribe the pressure with which the gauge is to be inserted.
 - (iv) Owing to the variable pressure with which the NEAFC gauge may be inserted by different operators, the use of this gauge leads to variable results in determining whether meshes comply with the prescribed minimum. This led the International Council for the Exploration of the Sea (ICES) to devise a spring-loaded gauge in which a standard pressure (4 kg) is applied to the jaws of the gauge across which the mesh is stretched. This ICES gauge like the ICNAF gauge measures the width of the mesh, whether above or below the prescribed minimum; but unlike the ICNAF gauge it applies the standard pressure along the length of the mesh and not transverse to it. The ICES gauge has been adopted as the standard gauge for scientific purposes on both sides of the Atlantic.

the ICES gauge for the purpose of the Commission's recommendations. This in turn seemed to raise doubts as to whether at its meeting in 1964 the Commission in adopting equivalent mesh sizes for *inter alia* the ICES gauge had at the same time implicitly approved that gauge as one of the alternative gauges allowed by the recommendation which had entered into force. The question was referred to the Commission which decided as a temporary measure to reaffirm approval of the ICES gauge for the purpose of that recommendation for one year only subject to review at the 17th Annual Meeting.

4. The recent special meeting of NEAFC in London was attended by observers from both Canada and the USA; but consideration of proposals for international control was not completed and will be resumed at NEAFC's next meeting. So far as the method of examining meshes is concerned, discussion of international control in NEAFC has centred on two points

- (a) the search for a single standard method of mesh measurement giving a uniform result independent of the operator and
- (b) the importance attached by some countries to securing from the outset that reports by international inspectors can be used as a basis for prosecutions in the courts of member countries.

A conflict emerged between these two concepts since it appeared that mesh measuring instruments most likely to satisfy the requirements of (a) were the ICES and ICNAF pressure gauges which, being spring-loaded, were unlikely to be acceptable in the courts of some countries. This led the United Kingdom to suggest that for the purpose of the international control scheme, the most satisfactory course, at least initially, would be to adopt the NEAFC simple flat gauge so constructed that the essential feature of that gauge, namely a parallel-sided section 2 mm thick and of appropriate width, would have added to it a wedge-shaped section or sections calibrated so that it or they could measure the width of meshes above or below the minimum prescribed. The United Kingdom suggested that for the purpose of enforcement the variable results achieved by such an instrument due to any variation in the pressure with which it was inserted by different operators could be accepted. Such variations were accepted for national enforcement and seemed unlikely to differ as between one country and another; and any variation from the uniform standard such as that achieved by the ICES gauge used by the scientists in their analyses and recommendations could be allowed for by appropriate modifications in the minimum meshes prescribed. No decision has yet been taken by NEAFC on this proposal. It may be noted, however, that the United Kingdom proposal was favourably received by the delegates of several other countries. In the course of the discussions the delegates of the USSR proposed that the Commission should adopt as the standard measuring instrument a simple wedge-shaped gauge inserted vertically into the meshes of the net (which would be held horizontally for the purpose) with the uniform pressure exerted by hanging a weight of 4.5 kg onto the gauge. It was pointed out that such a gauge although not spring-loaded appeared to comply with the original ICNAF specification though as it did not fit the recommendations in force in the NEAFC area these would have to be altered if this gauge were adopted.