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révision, mais le document qui devrait la remplacer n'a pas trouvé, soumis aux Comités Nationaux pour approbation sous la règle des six mois, le consentement désiré.

Il n'est guère possible d'exprimer l'utilité des travaux internationaux de normalisation par un chiffre monétaire. La participation aux réunions internationales et la bonne volonté si non pas le zèle pour arriver à une entente font cependant preuves que l'intérêt pour la normalisation dans le domaine des

télécommunications et de l'électronique doit être réel. L'atmosphère aux séances et le contact entre délégations ont toujours été le plus aimables, malgré certaines divergences d'opinion inévitables. On a bien le sentiment que l'industrie dans ce domaine de l'électrotechnique est vraiment internationale, ce qui ne peut pas étonner, puisqu'elle nous fournit les moyens de communications entre les peuples.

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The I.E.C. Central Office and its activities

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Après avoir résumé brièvement la tâche de la C.E.I., l'auteur décrit le rôle du Bureau Central et détaille ses différentes fonctions, donnant également un aperçu de l'organisation de ses services.

Nach einer kurzen Zusammenfassung der Arbeit der CEI beschreibt der Autor die Aufgaben des Bureau Central und geht dabei im einzelnen auf die verschiedenen Funktionen ein, wobei er ebenfalls kurz über die Organisation der Arbeitsvorgänge berichtet.

Introduction

My first reaction on being invited to write an article on the activities of the I.E.C. Central Office, was to look up the Statutes and the Rules of Procedure to find out what had been laid down as the official duties of the Central Office.

Reference is made in several places to specific duties to be carried out by the Central Office but it will be sufficient here to quote from Article 11 of the Statutes headed "Central Office and General Secretary" which reads as follows:

"The Central Office shall comprise the General Secretary and such staff as the Commission may require. It shall be located in the same place as the seat of the Commission.

The General Secretary... shall carry out the instructions of the Council."

The problem then remained how to clothe these bare bones and to give the reader an adequate picture of what is involved in carrying out the instructions of the Council. Before going into the detail of the Central Office's many functions, I should like to remind my reader briefly of the object and general organization of the Commission.

The object of the I.E.C., which has been in existence since 1906, is to facilitate the co-ordination and unification of national electrotechnical standards. In order to do this, it issues international recommendations which express as nearly as possible an international consensus of opinion on the subjects dealt with. The technical work of the Commission is carried out through Technical Committees, each dealing with a specific subject. The Technical Secretariat of each Committee is held by one of the National Committees of which there are at present 35. Meetings are held from time to time to discuss specific subjects for standardization; at an appropriate stage, draft recommendations are circulated to the National Committees for approval (Six Months' Rule) and are finally issued as printed publications when approved by at least four-fifths of the total membership.

The basic procedure is for draft proposals prepared by the Technical Secretariat to be circulated to all

National Committees for comment, these latter, in their turn, also being circulated. After consideration of the comments, a new draft is prepared either for further discussion or for approval. At all these points, the Central Office plays its part in reproducing and circulating the documents to all concerned.

Functions of the Central Office

The functions of the Central Office can be summarized under the following main headings:

1. To carry on the general administration of the Commission, including the collection and the administration of the funds of the Commission.

2. To ensure that the decisions of the Council or the Committee of Action are executed.

3. To receive and circulate proposals for new work and, on the instructions of the Committee of Action, to deal with the setting up of the Technical Committees involved.

4. To effect liaison between the I.E.C. and other international bodies.

5. With regard to all Technical Committees and in co-operation with their Chairmen and Secretariats:

a) To circulate proposals from the Secretariat for consideration by the National Committees.

b) To circulate comments received on these proposals.

c) To make arrangements for meetings, dates and places; to circulate calling notices and agendas.

d) To circulate minutes of meetings.

e) To circulate draft recommendations for approval under the Six Months' Rule and, if necessary, amendments under the Two Months' Procedure.

f) To record the votes and comments in draft recommendations circulated for approval. To communicate these to Chairmen and Secretariats of the Technical Committees concerned, and to circulate the report on the voting.

6. To print, publish and sell I.E.C. publications.

To this list should be added the co-ordination of the technical work of the Commission.

The ever-increasing number of subjects dealt with by the I.E.C. and the rapidity with which the Technical Committees are working, mean that the co-ordination of the work of the different Committees is becoming more and more important if duplication of effort or even conflicting recommendations within the I.E.C. are to be avoided. Whilst, so far, it has not been possible for the Central Office to do as much in this direction as might have been desirable, it is fully appreciated that this function of the Central Office will have to be developed in the future when additional technical staff becomes available.

Staff and Organization

Twenty-two persons are at present employed in the Central Office.

In an organization that has developed rapidly, it has been necessary to preserve as great a flexibility of staffing as possible, and the size of the Central Office has precluded the establishment of rigidly defined sections, except for specialist tasks such as sale of publications, duplicating and assembly of documents.

However, the following main "streams" of work may be distinguished:

- a) General administration
- b) Translation and editing
- c) Typing of documents
- d) Duplication and assembly of documents
- e) Dispatch of documents
- f) Approval of draft recommendations
- g) Printing of publications
- h) Sale of publications.

Council and Committee of Action

These are the administrative bodies of the Commission. As a rule the Council meets once every three years and the Committee of Action at least once, sometimes twice, a year.

It is the duty of the General Secretary, in close co-operation with the President of the Commission, and the Treasurer on financial matters, to prepare agendas for these meetings. The proposals to be discussed are also circulated for comment and these latter circulated and analyzed before the meeting. Every three years the Council elects a new President and a new Treasurer and one-third of the Committee of Action membership is renewed. It is the responsibility of the Central Office to ensure that the procedure laid down in the Rules of Procedure for such elections are followed and to secure nominations for the several offices falling vacant. As mentioned above, it is also the responsibility of the Central Office to ensure that effect be given to the decisions of the Council or Committee of Action.

Liaison with other International Organizations

In 1947 the I.E.C. was affiliated with the International Organization for Standardization (ISO) as its electrical division, whilst retaining administrative and financial autonomy. As the result of the agreement then reached between the two organizations, the I.E.C. Central Office and the ISO General Secretariat were both established in Geneva. They are both accommodated in the Geneva International Centre, a building

erected by the State of Geneva on the Place des Nations, around which are grouped the buildings containing the seats of many international organizations.

There are many subjects requiring co-operation between the I.E.C. and the ISO Technical Committees: Nomenclature, Units, Letter symbols, Dimensional Standardization, etc., and the necessary liaison is assured by the Central Office of the I.E.C. and the ISO General Secretariat.

Liaison is also maintained with twenty-nine other international organizations, both governmental and non-governmental, whose work has a bearing on the activities of the I.E.C. Co-operation with these organizations takes many different forms: exchange of documents and publications, exchange of observers at meetings of common interest, transmission to the I.E.C. by these organizations of suggestions for new work and sometimes of proposals for study in connection with a draft I.E.C. recommendation, based on the work of their experts.

Annual Report, Administrative Documents

One of the responsibilities of the Central Office is to prepare an annual report, summarizing the activities of all Committees in the period under review.

A printed catalogue of all I.E.C. Publications is also issued annually. Various other administrative documents such as the General directives for the work of the I.E.C. and the Guide to the drafting of I.E.C. documents, are prepared and issued as required.

Meetings

A General Meeting grouping meetings of fifteen to twenty-five Technical Committees and Sub-Committees is held annually. In addition, similar meetings of one or perhaps a few Committees are held at other times of the year. All these meetings are convened by the Central Office which circulates agendas together with any additional information concerning the general organization of the meetings and registration and accommodation forms for the delegates. After the meeting, minutes are circulated in English and French.

The date and place of General Meetings are fixed by the Committee of Action, generally two years in advance, and such meetings require much careful preparatory work from both the host National Committees and the Central Office, which co-operate closely in the preparation of the programmes. Several months before such a meeting is held, it is usual for the General Secretary to visit the town in which the meeting is to be held and to discuss details of organization with the host Committee.

Attendance of the General Secretary or the Assistant General Secretary is often required at the smaller meetings held between General Meetings.

Translation and Editing

Linguistic questions are of vital importance in international work, as many misunderstandings are caused by difficulties of language.

The annual report, all administrative documents and all minutes of meetings are circulated in English and French. As many as possible of the basic Secretariat documents, as well as the comments thereon, are also circulated in the two languages.

The greater part of this translation work is done in the Central Office, although in the case of Secretariat documents having reached a late stage of discussion, and always in the case of draft recommendations, the bilingual drafts are prepared by an Editing Committee.

All drafts passing through the Central Office are edited, so that they conform as far as possible to the "I.E.C." style of presentation. References to other I.E.C. documents are checked and, in the case of draft recommendations, a check is made on the use of letter symbols, etc., recommended by the I.E.C.

Approval of Draft Recommendations

At any given time there are about 60 draft recommendations on which voting is proceeding, either under the Six Months' Rule or the Two Months' Procedure.

At the same time as a draft recommendation is circulated for approval, a special folder is prepared in which completed voting papers and comments are filed and recorded, together with any special correspondence, as and when received. A few weeks before the end of the voting period a reminder is sent by registered post to all National Committees which have not sent in voting papers.

When the voting period has expired, the comments received are reproduced and copies are sent to the Secretariat and Chairman of the Technical Committee concerned, with a statement of the votes received for and against the draft. After considering comments and votes, the Secretariat sends to the Central Office a review of the comments received with the Secretariat's observations and a statement by the Chairman on the action to be taken as a result of the voting, for inclusion in the report on the voting.

The final stage is the circulation to all National Committees of the report on the voting. This contains a record of the voting, the comments received, the Secretariat's observations on the comments and the Chairman's statement on the action to be taken.

Apart from the question of the length of the document submitted to the National Committees for approval, and comments received, circulation of a document under the Two Months' Procedure involves the Central Office in exactly the same amount of work as for the Six Months' Rule.

Reproduction of Documents

All incoming drafts are edited, as mentioned above. Indications regarding typing priority, whether a translation will be required, any special information to be given in the Dispatch Advice Note (such as time limits for submitting comments), are marked on a job slip which accompanies the document throughout its passage through the Central Office. Job slip and draft are passed to the documents officer who records the job in a register, enabling a check to be made immediately on the progress of the work.

Drawings are reproduced on an electronic stencil cutting machine, the special stencils being linked up with the part of the document typed on ordinary stencils before the job is handed in for checking. Checking is in two stages, the first stage being carried

out by the typists themselves and the second part by a technical proof-reader who pays special attention to points such as letter symbols, formulae, tables, etc. After passing through these stages, a random check is made by another officer as a further precaution. The job is then marked with the number of copies required and goes on for duplication and dispatch. In an average week, some 200 kg of documents are sent out.

Printing of I.E.C. Publications

The culmination of all the I.E.C. work on a given subject is the issuing of an I.E.C. Recommendation which will be used as the basis of national specifications. The printing of I. E. C. Publications, therefore, requires much care.

The final text for publication is prepared by the Secretariat of the Technical Committee concerned, usually with the help of a bilingual Editing Committee. When the manuscript arrives at the Central Office, it is read through carefully to ensure that units, letter symbols, etc. are those recommended by the I.E.C. The different types used for headings, tables, letter symbols, etc. are indicated for the guidance of the compositor and a model of the complete publication is prepared so that the printer can see clearly what is wanted. Drawings for illustrations are checked for compliance with the I.E.C. recommendations for graphical symbols and instructions are given to the block-maker as to the final size in which the figures will appear in the printed text.

Proofs are checked in close co-operation with the Secretariat and members of the Editing Committee.

Since 1958, a Russian-English version of all I.E.C. Publications has been issued in addition to the older French-English version. The Russian manuscript is supplied by the U.S.S.R. National Committee, and the text is printed in Geneva.

When the copies of a publication are received from the printer, a press notice giving a brief description of the contents is written, which is circulated to the National Committees with their free copies of the publication.

Sale of Publications

On an average, about 1000 publications are sold monthly, orders being received from all over the world. In 1960, publications were sold to a total value of 118 000 Swiss francs.

Archives

An organization such as the I.E.C. must necessarily maintain extensive archives and records. Requests for additional copies of Working Documents are received almost daily. Extra copies are kept for two years or until the next meeting of the Committee concerned, whichever be the longer.

A complete file of all documents circulated by the Central Office since its transfer to Geneva is maintained, as well as a partial file of earlier documents.

Office Methods and Equipment

In 1960 the Central Office reproduced and circulated some 2700 documents involving the typing of

some 9500 stencils and the use of 12 t of paper. With the figures involved, it is evident that small economies can result in appreciable savings in the running of the Central Office and a watch must be kept on the quality, price and availability of supplies. One of the duties of the officer concerned is to keep an eye open for new methods of working that will either result in economies or in improved service to the National Committees for the same cost.

Conclusion

I hope that the above account has given the reader some idea of the duties that are carried out by the Central Office, whose staff has expanded fourfold between 1950 and 1960, in order to cope with the ever-increasing rhythm of international standardization.

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A. GALVANI

1737 — 1798

Im September 1786 entdeckte Luigi Aloysius Galvani (geboren am 9. September 1737 und gestorben am 4. Dezember 1798 in Bologna) die nach ihm benannte Berührungselektrizität. Er war Arzt und Naturforscher, wurde 1766 Professor der Anatomie und betrieb in dieser Eigenschaft besondere Forschungen über Nerven. Dabei stellte er an Froschschenkeln fest, dass diese Zuckungen ausführen, wenn der aus ihnen und zwei verschiedenen Metallstücken gebildete Stromkreis geschlossen wird.

Seine grundlegenden Versuche veranlassten den Grafen Alexander Volta zu weiteren Studien.

H. W.



A propos de la stabilité du réglage de vitesse d'un groupe turbine hydraulique-alternateur

Conditions à poser pour la détermination de l'inertie de l'alternateur

Par D. Gaden, Genève

621.313.322—82 : 621.316.718.5

Le présent article a été élaboré à la demande de la Commission d'Etudes pour le Réglage des Grands Réseaux Electriques de l'Association Suisse des Electriciens. Selon le vœu émis au sein de cette Commission, l'auteur insiste sur l'intérêt qu'ont les acquéreurs de groupes hydro-électriques, les producteurs d'énergie et leurs ingénieurs-conseils, à connaître les caractéristiques du réseau que ces groupes sont appelés à alimenter : la façon dont la puissance absorbée par les appareils utilisateurs de l'énergie varie avec la fréquence et la variabilité dans le temps de cette puissance, ce qui permet de juger de la rapidité de réponse que le réglage doit assurer. Ce mémoire fait en partie suite à certains exposés présentés à la Journée de discussions organisée à Berne le 19 janvier 1961 par l'Association Suisse des Electriciens.

Die vorliegende Arbeit wurde im Auftrag der Studienkommission für die Regelung grosser Netzverbände des Schweizerischen Elektrotechnischen Vereins ausgeführt. Entsprechend einem im Rahmen der Kommission geäusserten Wunsch wird das Hauptgewicht auf folgende Punkte gelegt, die sowohl für den beratenden Ingenieur der das Wasserkraftwerk projektierenden Firma wie auch für den Betriebsingenieur des Kraftwerkes von besonderem Interesse sind. Es handelt sich dabei um die Kenntnis der Eigenschaften des zu speisenden Netzes, d. h. um die Frequenzabhängigkeit der aufgenommenen Leistung der angeschlossenen Verbraucher und die Schwankungen dieser Leistung mit der Zeit — Faktoren die es ermöglichen, die erforderliche Schnelligkeit der Regelung zu beurteilen. Diese Ausführungen stellen zum Teil eine Ergänzung der Vorträge dar, die an der Diskussionsversammlung des SEV vom 19. Januar 1961 in Bern gehalten wurden.

Nous ne prétendons dans cet exposé à aucune originalité quelconque et nous nous proposons seulement de rappeler, en y insistant, qu'à côté du coup de bélier qui exerce une influence défavorable sur le réglage d'une turbine hydraulique, il existe dans le régulateur et surtout dans l'ensemble du réseau, comprenant les appareils d'utilisation de l'énergie, d'autres facteurs dont l'effet est au contraire favorable et qu'il serait regrettable de ne pas prendre en considération.

Parmi ceux-ci nous citerons en premier lieu la proportion dans laquelle la puissance absorbée par les consommateurs de l'énergie, autrement dit le couple résistant développé par l'alternateur, varie en fonction de

la fréquence (vitesse de rotation du groupe), puis la possibilité qui existe peut-être de ralentir la rapidité de réponse du réglage, tout en lui conférant une valeur suffisante pour qu'elle lui permette de satisfaire convenablement à la variabilité dans le temps de cette puissance.

Comme chacun le sait, c'est le phénomène de coup de bélier qui caractérise essentiellement le réglage des turbines hydrauliques et qui constitue la source principale de ses difficultés. Lors des mouvements de vannage nécessités par le réglage et entraînant des modifications du débit écoulé, l'inertie des masses d'eau provoque des variations de la pression ou de la différence de