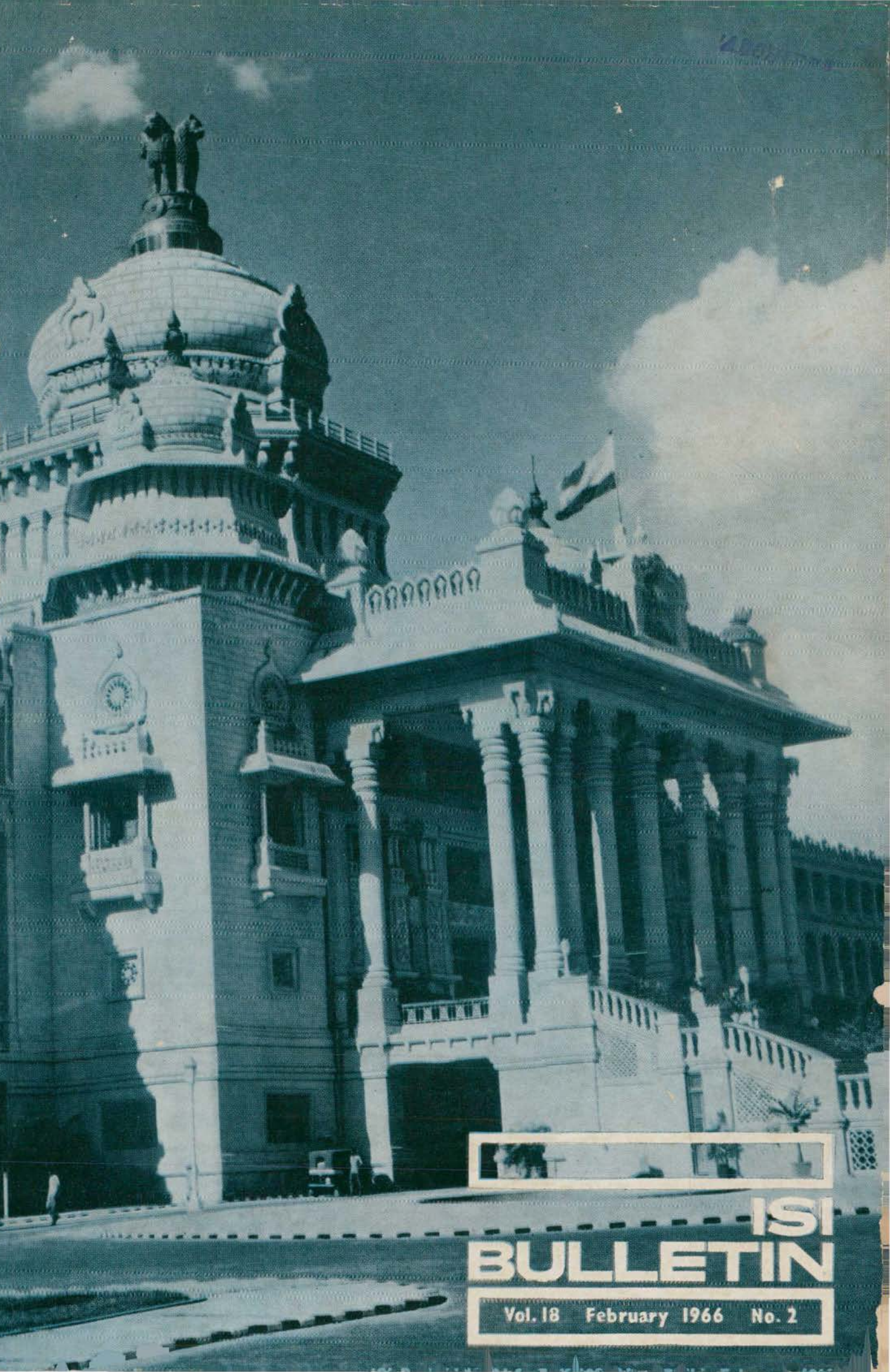

ISI BULLETIN

Vol. 18 February 1966 No. 2

ISI BULLETIN

■ VOLUME 18 ■ FEBRUARY 1966 ■ NUMBER 2

CONTENTS

Regular Features

■ **The Cover** — *The imposing Vidhana Soudha at Bangalore, the seat of the Mysore State Secretariat, where, inside the sandal-scented Banquet Hall, the Ninth Indian Standards Convention was inaugurated by Shri S. Nijalingappa, the State Chief Minister, on 13 December 1965.*

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Quality control in steel

From 1st April 1965, Tata Steel have adopted the I.S.I. Certification marks scheme. Under it, the steel plants take complete responsibility for the testing and certification of their products without the intervention of any outside authority. In Tata Steel the scheme covers a wide range of products—structural steels in standard and ordinary qualities, billets for re-rolling, galvanised and black sheets and steels for general engineering purposes.

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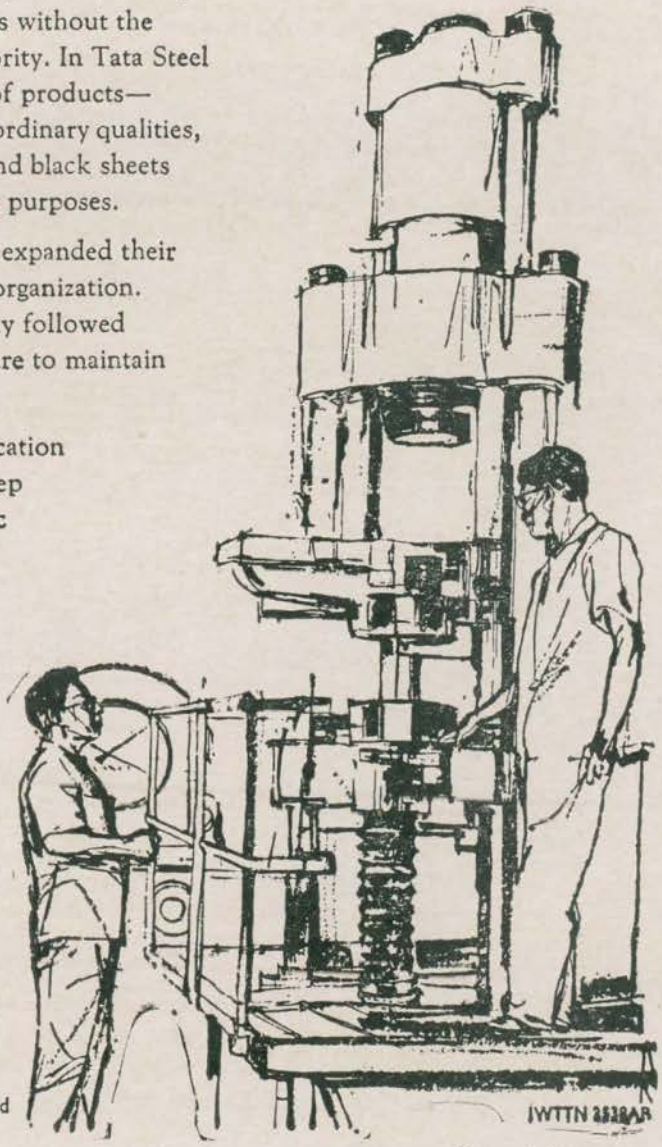

TATA STEEL

The Tata Iron and Steel Company Limited

Eastern Stores have a fleet of **37 Ashok Leyland Comets** and will go for more

Ashok Leyland Comet tractor-trailer coupled with Mahindra Owen "Gama" semi-trailer hauling a 11-ton boiler 25'4" long and 9' high

Reasons: **Higher payload capacity, greater earning power, remarkable operational economy**

Eastern Stores are established goods contractors of Ahmedabad. Their fleet now includes 28 Ashok Leyland Comet goods vehicles and 9 Comet tractors coupled with Mahindra Owen "Gama" 11-ton payload semi-trailers. For good reasons, too! They have found Ashok Leyland Comets ideal for the long haul as well as for short distances, combining remarkably low fuel consumption with a longer service life and economy in maintenance and overhead costs "unequalled by any other vehicle." *Exclusive features:* The Ashok Leyland Comet is a heavy-duty chassis built for rugged performance. It combines all these exclusive features: 100 b.h.p., 255 lb./ft. torque engine that needs no reboring (you just replace the liners with the engine *in situ!);* Nitrided crankshaft that needs no regrinding under 2 lakh miles...and it can be re-ground five times; 9"-deep heavy-duty frame; 8-ton rear axle; 13" dia. clutch; 5-speed constant mesh gear-box; and 24-volt electrical system. No wonder experienced transport operators prefer to add more and more Ashok Leyland Comets to their fleet strength to ensure higher efficiency and greater profits.

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—the heavy-duty chassis for heavy-duty work

A4 ASHOK LEYLAND LIMITED, Ennore, Madras.

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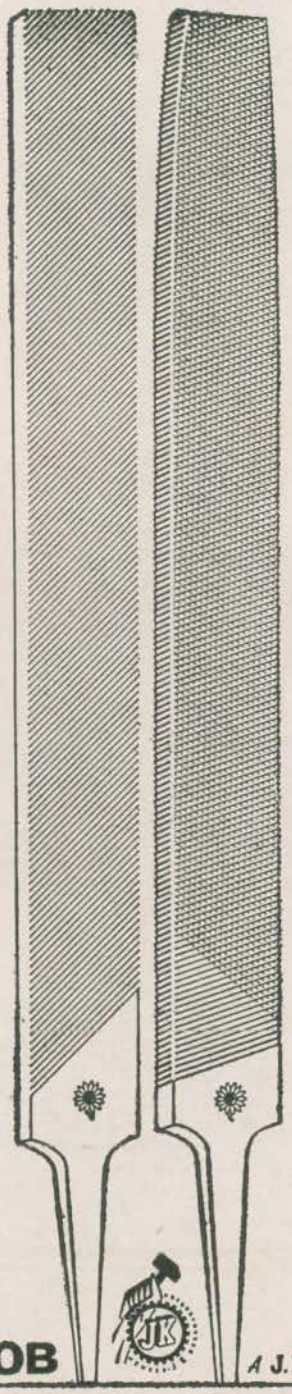

JK-21

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A5

INDEX TO ADVERTISERS

BUYER'S GUIDE

For the benefit of our readers we list below the products, carrying the ISI Certification Mark, advertised in this issue.

PRODUCT	LICENSEE	PAGE
Aluminium wrought and aluminium alloy sheets, strips and circles (IS : 21-1959)	Devidayal Metal Industries Private Ltd, Bombay	A29
Biscuits (excluding wafer biscuits) (IS : 1011-1957)	i) Britannia Biscuit Co Ltd, Calcutta ii) J. B. Mangharam & Co, Gwalior	A22 A27
Cables a) PVC insulated (heavy duty) electric cables for working voltages up to and including 1 100 volts with copper and aluminium conductors [IS : 1554 (Part I) - 1961]	Indian Cable Co Ltd, Calcutta	A18
b) PVC insulated cables, single core (unsheathed), 250/440 and 650/1 100 volts grade with copper or aluminium conductor and twin flat with or without earth continuity conductor (PVC sheathed) 250/440 volts with copper conductor only. [IS : 694 (Parts I & II)—1964]	PVC Wires & Cables Pvt Ltd, Calcutta	A24
Graphite a) Graphite for paints (IS : 62-1950) b) Graphite for use as foundry facing material, grades 1 & 2 (IS : 1305-1963)	J. D. Jones & Company Ltd, Calcutta	A13
Motors—Three-phase induction motors from 1 hp to 25 hp both with class A and E insulation (IS : 325-1961)	Gautam Electric Motors New Delhi	A10
Parallel shank (short series) and taper shank twist drills (IS : 599-1960)	Indian Tool Manufacturers Ltd, Bombay	A7
Plugs, sparking 14 mm (IS : 1063-1963)	Motor Industries Co Ltd, Bangalore	A12
Tubes and tubulars, mild steel (IS : 1239-1964)	Indian Tube Co Ltd, Calcutta	A26
Wire Ropes a) Steel wire ropes for winding purposes in mines (IS : 1855-1961) b) Steel wire ropes for haulage purposes in mines (IS : 1856-1961) c) Steel wire ropes for general engineering purposes (IS : 2266-1963) d) Round strand galvanized steel wire ropes for shipping purposes (IS : 2581-1963)	Fort William Co Ltd, Calcutta	A2

EDITORIAL

Convention Thoughts

■ The Ninth Indian Standards Convention held at Bangalore last December was significant for more than one reason. In the first place, it was the most well-attended Convention with over 900 scientists, engineers, technologists and leaders of industry and trade, including some from abroad, participating—an abundant proof of the strength which the standards movement in this country is gathering. Secondly, in the context of recent events, which the country had to pass through, the conference acquired a new dimension. It provided a forum for discussing urgent issues facing the country's defence, and industrial and trade operations. What transpired at the technical sessions truly reflected the mood and determination of the people as a whole. And Dr T. N. Singh, Union Minister of Industry, who presided over the inaugural function, clinched the issue when he observed, 'To make our production defence-oriented, we need today an extensive standardization activity coupled with more expeditious procedures and practices for the preparation of standards so as to achieve high overall productivity with maximum utilization of indigenous materials and resources'.

The preparations for the Bangalore Convention were taken in hand almost a year ago when no one could have anticipated the crisis through which the country has had to pass during the past six months or so as a result of the tragic border tensions and conflicts that developed. Nevertheless, most of the subjects which were selected for discussion at that time really proved to be important areas of a national programme of topical significance to the nation as a whole. This coincidence, it may be stated, however, was no accident but was the direct result of India's approach to systematic development through a planned effort in which standardization plays an important role.

The wide-ranging discussions covered diverse areas of standardization, such as agriculture and food, building materials, overseas collaboration, and export promotion. Many useful suggestions were made for tackling the problems of shortages and optimum utilization of national resources with the object of attaining self-sufficiency through maximum self-reliance in every field. Here, agriculture figured rather prominently. The need for increased use of standards for agricultural implements, seeds, fertilizers, pesticides, storage structures and preservation processes to achieve higher productivity in this vital sector was emphasized, among others, by Dr T. N. Singh, Shri Manubhai Shah and Shri Nijalingappa. The Mysore Chief Minister went to the extent of saying that the biggest industry which did not conform to standards was the agriculture industry. He, therefore, urged that steps should be taken to evolve methods to improve the quality as well as the quantity of agricultural produce in the country. Viewing the problem from the export angle, Shri Manubhai Shah expressed concern over the prevailing prices of some of the agricultural commodities, such as oils and oilseeds, which were the highest in the world and highest ever in India. This had led not only to reduced availability of these commodities within the country but had also resulted in loss of foreign exchange earnings.

The discussions at the various technical sessions underlined the need for meeting more effectively the challenge of bringing standards to the service of our farms and factories. Some delegates felt that voluntary standards had not gone far enough in achieving this; in their view the answer lay in making standards mandatory, at least in areas where health and safety of the consumer were directly involved. The general consensus, however, was that a wider and more stringent application of standards was called for in all sectors of industry, while retaining the voluntary character of standards generally.

The success of the Bangalore Convention was due in no small measure to the outstanding manner in which the local Reception Committee, headed by the

indefatigable Shri Gangadhara Setty, managed the whole gamut of the conference affairs from housing the delegates to arranging the technical sessions, the factory visits and the social events in the minutest detail. It was due to this meticulous care and attention to details that the entire programme of the conference went through with clockwork precision. The Bangalore organizers truly earned the gratitude and goodwill of all the delegates.

The keen interest evinced by the press in reporting the technical deliberations of the conference was yet another encouraging feature of this Convention. Many constructive suggestions and comments were put forth by the press through their leading articles and editorial comments.

ISI Convention, over the years, has become an annual event which provides a central platform for interchange of views among technologists, scientists, producers, consumers and others on matters concerned with standards and standardization, as applied to different areas of the Indian economy. First started on a modest scale in 1954, the Standards Convention has snowballed into a national event and its significance is all the more enhanced in times of economic stress, like the present one. The results of the deliberations provide for ISI valuable guidelines for taking stock of the progress made and also of the difficulties and problems which stand in the way of future progress. This broad-based get-together is also helpful in directing the policies and programmes of the Institution and in enabling it to function more effectively by quickly responding to the changing environment and to the demands made on its services.

From the Bangalore Convention, we can derive much strength and satisfaction in the wide support and awakened interest that it demonstrated in the importance of standards programmes at the company as well as national levels. What is more, the discussions emphasized the deep involvement of ISI in the tremendous tasks of nationbuilding, in which standardization activity, to quote Dr T. N. Singh, 'has to play a progressively significant role in the achievement of our national objective of self-reliance'.

OUR NEW PRESIDENT

SHRI D. SANJIVAYYA

who took over as Union Minister of Industry and President of ISI on 24 January 1966.

TISCO — PATRON MEMBER OF ISI

■ The Tata Iron & Steel Company Ltd (TISCO), Jamshedpur has enrolled as Patron member of ISI, the Institution's highest class of membership, by contributing Rs 25 000 per year.

TISCO has been closely associated with ISI's activities for several years. Hitherto, the company had been contributing Rs 3 000 per year as Sustaining member against the prescribed subscription of Rs 350 for this category of membership.

TISCO is the second company to become Patron member, the first being Hindustan Steel Ltd.

Dr T. N. Singh, Union Minister of Industry accompanied by Shri Jehangir J. Ghandy, arriving to preside over the inaugural function

Standards Rally at Bangalore

Accent on Productivity and Self-reliance

■ The Ninth Indian Standards Convention which met at Bangalore during 12-19 December 1965 underlined the role of standardization in the context of the ordeal through which the country has been passing and the need to achieve self-sufficiency through self-reliance in all sectors of the economy. Shri S. Nijalingappa, Chief Minister of Mysore, who inaugurated the Convention and Dr T. N. Singh, Union Minister of Industry and President ISI, who presided over the inaugural function, focused attention on some of the urgent problems facing the nation and called for positive action.

Discussions at the technical sessions emphasized the importance of orienting production to meet the defence needs and of putting the indigenous resources in materials and technological skills to optimum use. It was generally felt that a wider and more stringent application of standards to all phases of production activity would facilitate the attainment of these objectives.

The Convention attracted over 900 eminent scientists, engineers, technologists, research workers, leaders of industry and trade, and representatives of Central and State Governments from all over the country. There were delegates also from United Nations, Thailand and Iran.

Standards conventions which have been organized more or less annually for the past many years have served a useful purpose as they enable ISI to take stock of the work already accomplished and to mark out directions for future course of action. They are looked forward to as a forum for exchange of ideas and information and pooling of technical know-how, and establishment and renewal of personal contacts. The cross fertilization of minds thus brought about leads to the emergence of new concepts, fresh thinking and new proposals for promoting and strengthening standards activities in different fields. As these conventions are held in different industrial centres in the country, they also serve to arouse wider standards consciousness. Starting in 1954, the previous conventions in the series have been held successively at Calcutta, Bombay, Madras, Delhi, Hyderabad, Kanpur, Calcutta and Ahmedabad.

Dr T. N. Singh and Shri Jehangir J. Ghandy applaud as Shri Nijalingappa is garlanded

INAUGURATION

The Convention was inaugurated on 13 December 1965 in the gorgeous Banquet Hall of the palatial *Vidhan Soudha* (Secretariat) of the Mysore Government in the presence of a distinguished audience of over 1 500 including the visiting delegates, government dignitaries and the elite of the town. Messages wishing success to the Convention had been received from the Union President Dr S. Radhakrishnan, the late Prime Minister, Shri Lal Bahadur Shastri, and the Governor of Mysore Shri V. V. Giri; Shri K. A. Nettakallappa, Chairman of the Convention Souvenir Committee read out the messages.

Presidential Address

Presiding over the inaugural function, Dr T. N. Singh called for concerted efforts to augment production and curtail imports and generally to strengthen the country's production potential to enable it to face external aggression and solve internal economic problems. Reiterating the need for maximum self-sufficiency through maximum self-reliance, Dr Singh desired that there should be a chastening of outlook in the matter of dependence on foreign aid to which we got used to just because it was somehow readily forthcoming in the past.

The Minister drew attention to the big strides which the country had taken in steel production, oil exploration and refining, machine building, transport and communications, and generation and distribution of power. Efforts were now required not only to make the fullest possible use of the capacities so generated but also to set up new industries and to evolve new techniques to develop indigenous substitutes for products hitherto being imported. At present, the country was dependent on external supplies for spares, components and equipment to the tune of some Rs 2 000 to 3 000 millions a year. This offered a vast scope to Indian engineers and technicians to exercise their skills to develop substitutes from internal resources. For this purpose; an intensive programme of interchangeability of spares and components will have to be organized with the help of standardization. Dr Singh had no doubt that in the context of the urgent need for import substitution and maximum utilization of the indigenous industrial capacities, ISI, which was engaged in the task of preparing national standards for about two decades, had to play a very vital role.

Turning to agriculture, the Minister said that need for self-reliance in this sector was all the more pronounced as the recent emergency had brought in a new dimension to our food problem by confronting us with the possibility of a breakdown at a time when we might be fighting for the very survival of our sovereignty. It hardly befitted the self-respect of a nation with a total cultivated area of nearly 390 million acres and a net irrigated area of 70 million acres to be an importer of foodgrains. In this field too, stan-

A view of the gathering. Seated in the front row are (from r *to* l) *Shri B. V. Baliga, Speaker, Mysore Legislative Assembly; Shri K. Mallappa, Minister of Industries; Shri G. Narayana Gowda, Minister of Agriculture; Shri M. V. Rama Rao, Home Minister; and Shri G. V. Hathkeri, Chairman, Mysore Legislative Council*

Another view of the gathering at the inaugural function

dardization could play a notable role for achieving self-sufficiency. Indian Standards for agricultural implements and inputs like fertilizers, seeds and pesticides could go a long way in increasing the yield per acre. There are other standards covering storage structures, preservation processes and conservation of foodgrains which could help to stretch the available supplies. Dr Singh felt that a proper implementation of these standards would help to wipe out the estimated shortfall of 10 percent in the country's food requirements.

Laying stress on the need for standardization for organizing defence production in times of emergency, Dr T. N. Singh said that it was highly important to base the production of defence equipment and weapons on carefully evolved specifications which could ensure quick results and in which chief reliance was placed on materials and resources immediately available within the country. To make the country's production defence-oriented, an extensive standardization activity was needed coupled with more expeditious procedures and practices for the preparation of standards. Referring to export promotion, the Minister said that the basic requirements for maintaining India's existing markets and creating new ones abroad was to win and continuously maintain the goodwill and confidence of buyers through a vigorous application of quality standards. He felt that the implementation of Indian Standards and the ISI Certification Marks Scheme would improve the quality of goods.

Dr Singh felt that standardization efforts in the country should not remain limited to ISI alone. He exhorted the leading industrialists both in public and private sectors to take up in-plant standardization at the company level. A well organized company standardization department could continuously address itself to the peculiar problems of the enterprise such as substitution of imported materials and components, evolution of new designs, selection of special designs and varieties of nationally standardized items for the individual use of the enterprise, and limiting the variety of components and materials going into production and of the products coming out of the factory.

Concluding, Dr T. N. Singh said that there was no room for compromises and no scope for delay. The country had chosen the path of self-sufficiency which had to be pursued with vigour, and in this standardization had to play a progressively significant role.

Shri S. Nijalingappa delivers the inaugural address. Seated on the dais (from l *to* r*) are Shri Prabhu V. Mehta, Shri Y. N. Gangadhara Setty, Dr T. N. Singh and Shri Jehangir J. Ghandy*

The full text of the Presidential Address is reproduced on page 57.

Inaugural Address

In his inaugural address Shri S. Nijalingappa, Chief Minister of Mysore, said that it was the bounden duty of everyone concerned with the manufacture and production of goods in the country to get together, sort out problems, decide things and carry them out in a disciplined way. In the record attendance at the Convention, Shri Nijalingappa saw a proof of the fact that the need to inculcate discipline had been realized. He exhorted the industrialists to produce more, produce well, produce in a disciplined way and produce superior goods. According to him, Dr M. Visvesvaraya's slogan 'Industrialize or Perish' had more significance now than ever before.

Shri Nijalingappa pointed out that agriculture was the biggest industry in the country and, therefore, it should be accorded due priorities in all developmental programmes including standardization. Agriculture accounted for 50-55 percent of our national income and supplied raw materials to the industry to the extent of 50 percent. It was high time that necessary help was given to the farmer to improve his output and to produce things of a better quality.

Turning to the prospect for industrialization, Shri Nijalingappa stressed that both public and private sectors had to play notable roles. He felt that there was no cause for the private sector to feel discouraged or despondent as the government was keen to help it even more than the public sector. The Chief Minister desired that a spirit of healthy competition should be encouraged between public and the private sectors.

Shri Nijalingappa was happy to learn that Indian goods stamped with ISI Mark were being respected wherever they were sent in national and international markets. The way ISI had been widening its activity was a further indication of the fact that more and more people realized that if their products conformed to certain

HIGHLIGHTS

906 delegates attended the Bangalore Convention—the highest attendance at any Convention so far.

Lady delegates too, numbering 106, *established a new record. There were, in addition,* 50 *'accompanying ladies'—again a record number.*

Technical Sessions were the most well-attended, with as many as 95 *percent of those expected to participate being present.*

Another record which might not go by default : It was the first Convention at which the usual dinners and banquets for the delegates were missing—for good reason and, therefore, with no regrets.

Shri Jehangir J. Ghandy addressing the inaugural function

standards, national or international, they would command better markets.

Jehangir J. Ghandy, President ISO

Shri Jehangir J. Ghandy drew attention to the benefits that could be derived by India and other developing countries through closer association with ISO, a world body with impelling influence. International trade was a major factor in India's development. For many years India was accustomed to import finished products and export agricultural products and other raw materials. Of late, more attention was being paid to the manufacture of finished products of proven quality as demanded by overseas customers in international markets which were getting increasingly competitive. It was here that by adopting international standards India could advance much faster.

Emphasizing the need for greater participation in all spheres of ISO's activities, Shri Ghandy said that any expenditure in this direction would be a sound investment which would bring rich dividends. He was conscious of the discouraging imbalance in the external trade, but he strongly urged that standardization as one of the remedial measures should receive priority in the allocation of funds including foreign exchange for international work. "There are only two courses open to us—either we take our rightful place in the frontline of the standardization movement, thus ensuring our due share in the international trade and in the resultant benefits, or we miss this wonderful opportunity by our short-sighted approach where far-sighted boldness will pay."

Shri Ghandy appreciated the part which India had been playing in international standardization and paid a tribute to the dynamic leadership of Dr Lal C. Verman, Director ISI, and his abiding contribution to the development of standardization on national and international levels. Shri Ghandy regarded his election as President of ISO as a recognition of the good work done by India and ISI in this field. India had also given a commendable lead with regard to changeover to metric system—a step which had stimulated similar activities even in industrially advanced countries like UK. A senior officer of ISI was at the moment assisting BSI to draw up plans for metric changeover in British industries. The ISO President also made reference to the effective steps being initiated to overhaul and simplify the structure of ISO with a view to streamlining it and putting greater speed in its work.

Welcome Address

Earlier, welcoming the delegates, Shri Y. N. Gangadhara Setty, Chairman of the Reception Committee spoke of the concerted efforts being made since Independence to eradicate poverty, provide opportunities of employment and raise the standard of living of the Indian people. However, considerable ground still remained to be covered for the achievement of our cherished goals. Production had not only to meet indigenous requirements but also to find export markets. Standardization

Prof M. S. Thacker reads the citation of the K. L. Moudgill Award presented this year to Dr N. N. Dastur, Director, National Dairy Research Institute, Karnal

Dr N. N. Dastur receiving the K. L. Moudgill Award from Shri S. Nijalingappa

could play a notable role in producing goods which could compete favourably in international markets. Shri Setty regarded standardization as a scientific yardstick which, when used properly, led to considerable improvement in quality, betterment of productivity, reduction of costs and proper husbanding of available resources. He was glad to know that ISI had published over 3 200 standards while another 2 770 were under various stages of formulation.

Shri Setty pleaded for the opening of a branch office at Bangalore to provide the necessary aid and guidance to the various industrial units of the region. Such a branch office, he said, could also be instrumental in stimulating implementation of national standards and encouraging in-plant standardization activity.

K. L. Moudgill Prize

The Award of the Eighth K. L. Moudgill Prize to Dr N. N. Dastur, Director of Dairy Research, National Dairy Research Institute, Karnal, was announced by Dr Lal C. Verman, Director ISI, who also gave the background of the institution of the award on the retirement of Dr K. L. Moudgill to commemorate the excellent services he had rendered to the Institution and to the country. Dr Moudgill is one of the outstanding Indian leaders who have been responsible for the establishment and progressive development of the standardization movement in the country. The prize is awarded yearly to any citizen of India who may be selected as having rendered most conspicuous service to the cause of standardization in the country. Earlier recipients of the award are: Dr Lal C. Verman, Late Lala Shri Ram, Shri G. D. Joglekar, Shri T. V. Ramamurti, Shri B. S. Krishnamachar, Shri Prabhu V. Mehta and Dr G. S. Hattiangdi.

The 1965 award to Dr Dastur was made for his outstanding contributions which put the fast-developing dairy industry of the country on the dairy map of the world and for his work on the development of a large number of standards on dairy products, equipment, processes and test methods. Prof M. S. Thacker, Member Planning Commission, read the citation covering the award which said:

"A distinguished research worker, educationist and dairy chemist, Dr Noshir Navroji Dastur, Director of Dairy Research, National Dairy Research Institute, Karnal, has made outstanding contributions, through research and standardization, in the establishment of a progressive dairy industry in the country during the past quarter of a century.

"As a member of the Agricultural and Food Products Division Council of ISI, its Standing Working Committee, and the Dairy Industry Sectional Committee, Dr Dastur has worked energetically to develop over 50 Indian Standards on equipment, methods of test, laboratory apparatus and dairy products. Among these, the fifteen Indian Standards on methods of test for dairy products, and dairy laboratory apparatus and glassware, under direct leadership of Dr Dastur, bear the impress of his mastery of dairy chemistry. In particular, '*IS : 1479-1960 Methods of test for dairy industry*' is a work of monumental importance to the Indian dairy industry, and in '*IS: 2981-1964 Layout for dairy laboratories*', virgin ground has been broken to furnish a standard blue-print, resolving a repetitive problem of importance to any developing country.

"In the international sphere, Dr Dastur has helped effectively to project the Indian viewpoint at many meetings of the ISO Committee, Subcommittee and Working Groups concerned with milk and milk products.

Dr A. N. Ghosh greeting Shri B. V. Baliga, Speaker of the Mysore Legislative Assembly

Shri S. Nijalingappa acknowledges greetings from Shri Prabhu V. Mehta, Vice-President ISI, as Dr Lal C. Verman looks on with interest

"For these valuable contributions to the promotion of standardization in dairy industry and its development, the Indian Standards Institution presents the 1965 K. L. Moudgill Prize to DR NOSHIR NAVROJI DASTUR."

In a letter addressed to Director ISI, Dr Dastur, while expressing gratefulness for the honour conferred on him announced his decision to contribute the entire prize money of Rs 1 000 to ISI for utilization in the construction of the new ISI Building and staff welfare activities.

Vote of Thanks

Proposing the vote of thanks, Shri M. K. Panduranga Setty, Secretary of the Reception Committee, expressed his gratitude to all organizations and individuals whose valuable help had made it possible to organize the big event in Bangalore. He specially thanked Shri S. Nijalingappa, Dr T. N. Singh, Shri Jehangir J. Ghandy and other dignitaries who had graced the inaugural session and tendered valuable advice.

Shri Panduranga made a special mention of Shri Baliga, the Speaker of the Mysore Legislative Assembly for having made available the Legislator's home for accommodating the delegates. He paid a tribute to Shri Y. N. Gangadhara Setty for his inspiring leadership and to all the members of the Reception Committee for their whole-hearted cooperation in raising funds and making the local arrangements for the conference.

TECHNICAL SESSIONS

The technical sessions, nine in number, were held in the Visvesvaraya Industrial and Technological Museum. As many as 189 technical papers were presented and discussed. Some highlights of the discussions at the different sessions are given in the following paragraphs.

Export Promotion

A stirring call for positive and concerted action by the nation as a whole to meet the present challenge for achieving self-reliance was given by the Union Minister of Commerce, Shri Manubhai Shah, while presiding at the technical session on 'Standardization as a Tool for Export Promotion'. Shri Shah said that all the agencies working in the fields of production, assembling, processing and marketing, both official and non-official, must coordinate their efforts to break through

Dr T. N. Singh and Shri S. Nijalingappa at the Get-Together

ON RECORD

Do not go on finding fault with Government and please make use of all things. Please produce more, produce well, produce in a disciplined way and produce superior goods. — Shri S. Nijalingappa, Chief Minister, Mysore State.

I must say that in the past we have been relying over-much on foreign collaboration and have been over-anxious to avail ourselves of foreign aid just because it was somehow readily forthcoming. There has to be a chastening of outlook in these matters now.—Dr T. N. Singh, President ISI and Union Minister of Industry.

Standardization is the scientific yardstick which, when properly used, leads to considerable improvement in quality and enhancement of productivity, reduction of costs and optimum ulilization of available resources. Standards are essential for any programme of economic and industrial development.—Shri Y.N. Gangadhara Setty, Chairman, Reception Committee, Ninth Indian Standards Convention, Bangalore.

If we, in this country, have to be a world trading body, we must start acting like one.—Shri Jehangir J. Ghandy, President, International Organization for Standardization.

Standardization, quality control and inspection are per se co-operative endeavours and have a bearing on all classes of society. These measures cannot and should not be viewed from the export angle only, divorced from that of the overall production and marketing within the country.—Shri Manubhai Shah, Union Minister of Commerce.

India has already taken a prominent place on the world map of standardization. By persistent efforts, we should maintain that place in the years to come.—Deccan Herald, Bangalore.

In a developing economy like that of India with its limited financial resources, the role of standardization is of considerable importance in ensuring the optimum utilization of all the available talent and material resources and raising production for not only the internal but foreign markets. Judged by this yardstick, the part played by the Indian Standards Institution during the last eighteen years in helping to raise industrial production and exports is indeed commendable.—Economic Times, Bombay.

Not all foreign participants are aware that some of the designs and materials for manufacture with which they are familiar are not suitable for adoption in India. Nor are all their Indian counterparts either technically competent or legally entitled, under collaboration agreements, to make changes on their own. Whether all future collaboration agreements should include conditions which would obviate such difficulties is worth examining.—Statesman, New Delhi.

Shri B. L. Bhatia, Organizing Secretary of the Convention, welcomes Shri S. Nijalingappa, Chief Minister of Mysore. At extreme right is Shri Y. N. Gangadhara Setty, Chairman of the Reception Committee

the past legacy and create an image of the country producing quality goods at economical cost. This would be possible through introduction of better production techniques, adherence to standards and better presentation and after-sales-service, wherever required. Shri Shah also emphasized the need to give proper care to the packaging of export materials.

Delegates generally emphasized the need for changing the pattern of the country's export from traditional items to manufactured, diversified and sophisticated products. Standardization and quality control were essential to promote export trade and to ensure stable overseas markets by creating a measure of strength and confidence in the buyer as well as the seller. In this connection, the participants generally welcomed the recent *Export (Quality Control and Inspection) Act 1963*, covering compulsory preshipment inspection of goods for export.

For the successful implementation of quality control and preshipment inspection activity, however, it was felt that adequate availability of trained management personnel and testing facilities throughout the country was very important. The setting up of zonal laboratories for specialized items manufactured in different regions of the country and of central laboratories for co-ordinating the work of zonal laboratories was suggested. The Chairman disclosed that steps were being taken by the Government to set up regional laboratories, testing houses and inspection agencies, at important export points. He also asked manufacturers and independent inspection agencies to set up testing laboratories in order to supplement the facilities provided by Government. The Minister assured that Government would help such agencies by allocating foreign exchange for import of specialized testing instruments and equipment.

Building Materials

The session discussed measures for conserving building materials through proper planning, assessment, design and management. Steps were outlined for better utilization of available materials like cement, brick, lime, steel, timber and roofing materials, and utilization of industrial wastes, such as blast-furnace slag and fly ash. In the Fourth Five-Year Plan, an investment of nearly Rs 100 000 million was contemplated on construction activity and as such even an economy of 5 percent in building materials and in construction costs would result in a very large overall saving.

Mechanization of building practices and production of building materials, which could be achieved in the next few years without incurring any foreign exchange, was suggested as one of the measures to meet the present challenge. Among the other measures emphasized were grading of ordinary Portland cement into at least two grades with a view to ensuring better utilization; developing lime industry as an organized medium scale industry; utilization of secondary species of timber in place of more popular varieties which are scarce; conservation of forest resources and minimization of the use of timber by the use of frameless doors and windows, particle boards, etc; and using new materials, such as plastics and PVC pipes for water supply and sanitary fittings. It was suggested that even the salient construction features of industrial buildings should be standardized to ensure that economies were effected. Adoption of management techniques in the organization of construction work was yet another powerful tool for reduction not only in materials but also in the construction cost as a whole.

Shri Manubhai Shah has an informal chat with the delegates

Formulation of unified recommendations at the national level, such as standard schedule of rates, standard labour outputs and standard contract form, were also referred to.

The delegates were agreed that the various construction agencies, such as Public Works Departments, large contracting organizations, engineering projects and similar other bodies, should have strong standards cells charged with the task of formulating departmental, project and inter-project standards. ISI could help to provide effective training in standardization to designers, builders, etc, required for manning these cells through specially organized courses on lines similar to in-plant standardization training courses.

Food Standards

The need for closer co-ordination between Indian Standards and the various statutory regulations like *Prevention of Food Adulteration Act (1954)* and *Agricultural Produce Grading and Marking Act (1937)*, was emphasized at the session. Delegates were of the opinion that the hygienic quality of perishable food stuffs, such as milk, meat and fish products, should be controlled by prescribing requirements for their bacteriological quality. Notwithstanding the difficulties about implementing the bacteriological requirements in the dairy industry as it existed today, a trial could be made in the case of well-organized dairies.

To facilitate interchangeability of fast-wearing parts, delegates recommended that standards should be formulated for the components which go in the making of agricultural implements rather than for the complete implement itself. It was, however, conceded that in the present set-up of the industry, it would be essential to give typical designs of the implements. In view of shortage of high carbon steel, efforts should be made for finding suitable alternate materials for the manufacture of farm implements.

As ground spices were known to be extensively adulterated, delegates recommended that their sale should be regulated by certification through *Agmark*.

Preparation of Indian Standards

Delegates noted that through certain measures taken by ISI during the last five years, it had been possible to cut down the time taken in the formulation of a standard by 25 percent. It was felt, however, that there was considerable scope for reducing this time still further. It was suggested that if the technical committees decided on a time schedule for preparing the standard at the start, the work could be completed within the time-limit. Company standardization activity should also be developed on a much wider scale so as to provide the nucleus for the development of national standards. Steps should also be taken to facilitate circulation of draft standards as widely as possible for comments on possible improvements. This would also ensure wider implementation of standards by those for whom they are designed.

A note of caution was sounded that while it was necessary to accelerate the pace of standardization, proper safeguards should be employed to ensure the quality of the standards produced.

Cost Reduction Through Standardization

Blind adoption of standards of overseas collaborators by the Indian industry led to proliferation of varieties of equipment and materials. The existence of a diversity of specifications resulted in large inventories, thus locking up capital resources which could otherwise be released for productive purposes. It was, therefore, necessary to organize effective company standards activity.

Examples cited by the delegates provided ample evidence of tangible benefits that could be derived through organized in-plant standards activity in industries dealing with cable, automobile, steel, building, fertilizer, leather, thermal power, food and dairy products.

Several delegates also pointed out that top management in many industries was still not quite bold on establishing company standards activities in their establishments. And since company standardization had to be co-ordinated through team work, top management support was essential. Mention was made of the facilities for training of engineers and technologists offered by ISI in order to encourage companies to set up standards departments in their establishments.

Shri V. V. Giri, the Governor of Mysore, bids farewell to the delegates. Seated from left to right are Shri K. Eswary Prasad, Chairman of Catering Committee; Dr A. N. Ghosh; Shri B. V. Baliga, Speaker of the Mysore Legislative Assembly; and Shri Y. N. Gangadhara Setty

Delegates study the machines at the International Instruments Pvt Ltd

Foreign Collaboration

The session helped to outline the practical difficulties which arose in the wake of overseas collaboration, especially in relation to standardization. A word of caution was sounded against over-enthusiasm for such collaborations.

Unrestricted collaboration had resulted in the introduction of national standards of various countries into Indian industry for similar products, deviating only in detail. When an attempt was made to lay down an Indian Standard to reduce the variety and multiplicity of types and sizes, it became a problem to bring about agreement among Indian manufacturers having different overseas collaborators and to persuade them to implement the standard once it was formulated. Attention was also drawn to the complications arising from collaboration with firms which did not follow the metric system.

Ways and means should, therefore, be found for converting the company standards of overseas firms in order to bring them in line with Indian Standards by incorporating the necessary conditions in the collaboration agreement. Promotion of company standards activity within the Indian industry would also assist in this task. An important point brought out by many participants was that Government should make it a condition that there should be a thorough scrutiny of the collaboration agreement in consultation with the Indian Standards Institution before permission was granted to an Indian entrepreneur to enter into an agreement with an overseas firm.

It was suggested that the Indian Standards Institution should publish guides for substitution of various ferrous and non-ferrous materials, depending on their indigenous availability. Dr Verman, Director ISI, briefly outlined the work being done in this respect and said that information on steels conforming to Indian Standards and standards of many advanced countries had been compiled and would soon be published.

Certification Marking

The technical session 'Extending Usefulness of ISI Certification Marks' emphasized that quality control of goods and ensuring their conformity to Indian Standards were indispensable both in the interest of export promotion and domestic market. The advisability of covering consumer goods as well as non-consumer goods like engineering items under Certification Marks Scheme came in for some animated discussion. While propriety of applying Certification Marks Scheme to consumer goods was never in doubt, it was suggested that the practicability of granting licences for engineering equipment and similar non-consumer items should be considered from the technical, economical and other related points of view.

The feasibility of compulsory certification marking of items affecting safety and health was considered and it was proposed that some legislative measures should be initiated to protect the consumer from such hazards. The delegates advocated that in order to protect their interest, consumers should organize themselves so that their voice could prevail effectively.

Welding

A strong plea was made for wider implementation of Indian Standards relating to welding. This would lead to improved safety for welded structures while ensuring utmost economy in the use of structural steel. It was, therefore, urged that proper steps should be taken for providing adequate trained personnel as well as raw materials and equipment needed by the welding industry. The establishment of a welding research centre in the country to undertake research and development work on welding materials and practices was advocated. It was also stressed that training courses in welding engineering should be provided at the graduate and post-graduate levels in the country. The economies that could be achieved in the overall cost through standardization of steel structures should be worked out. This will not only promote intensive use of welding techniques but would also help in increasing production and cutting down the time taken for completion of various projects.

The discussions brought out a number of moot points relating to rating of welding equipments, stress relieving of welded penstock pipes at site, methods of welding pressure vessels and problems of quality control in the field of welding wagons. Welding techniques and methods of testing and inspection of welded structures were examined in detail. The delegates urged reduction in the cost of weldable steel and for making available adequate quantities of weldable steel and electrode corewire steel.

Documentation and Library Housing

The participants noted that Indian languages were becoming the medium of communication in the country, and it had become very necessary that something should be done to see that authors did not use different words to express an idea which is new to India or to the world. It would, therefore, be of great help if a standard terminology were established in Indian languages. ISI could render a valuable service in this regard by establishing principles and canons for the pre-

Ladies' Group at the portico of the Visvesvaraya Industrial and Technological Museum

paration of standard terminology in each of the regional languages.

Library awareness in the country had also increased considerably since Independence. To meet the needs of the increasing number of readers, the participants felt that the implementation of relevant standards would lead to a lot of saving in time and would make the libraries functionally more efficient. ISI had published two Indian Standards covering the layout of library buildings and the library fittings and furniture, and their implementation needed the cooperation of library authorities, engineers and architects in the country.

RECEPTION COMMITTEE

A word must be said about the excellent arrangements made by the Reception Committee which contributed so much to the success of the Convention. For enabling the delegates to utilize their spare time profitably, a number of visits were arranged to places of technical interest like the Indian Institute of Science, Radio International Instruments Pvt Ltd, Jairamdas Udyog Pvt Ltd, Kirloskar Electric Co Ltd, Motor Industries Co Ltd, Mysore Electrical Industries Ltd, Mysore Feeds Pvt Ltd, and Radio and Electric Manufacturing Co Ltd. A number of get-togethers and cultural evenings were arranged to provide opportunities for informal mixing and exchange of views. In addition to a specially drawn up programme for the ladies accompanying the delegates, excursions were also arranged to Nandi Hills and Krishnarajasagar Dam. Souvenir Committee brought out an attractive 186-page publication containing interesting and informative articles bearing on some aspects of standardization and industrial development of the country.

DR H. J. BHABHA

■ The tragic and untimely death of Dr Homi Jehangir Bhabha, the noted Indian atomic scientist, in an air crash at Mont Blanc on 23 January 1966 removes an outstanding, illustrious and vigorous personality from the world of science.

Dr Bhabha built a high-ranking place for India in the field of atomic energy. The Atomic Energy Establishment at Trombay (AEET) with a scientific and technical staff of about 4 500 and a vast complex of reactors and other equipment developed with Indian initiative will stand as a permanent monument to Dr Bhabha whose life was cut short at the early age of 56.

In the development of electronics industry in the country, to which Dr Bhabha specially directed his energies in recent months, ISI and AEET have established active collaboration for laying down Indian Standards for electronic measuring equipment and electronic components including semi-conductor devices and valves. ISI has also received considerable help from AEET in the preparation of electro-technical vocabulary relating to nuclear power plants now being established in the country.

Born on 30 October 1909, Dr Bhabha received his education at Cambridge where he received his Ph. D. in 1934. He served at the Indian Institute of Science, Bangalore from 1940 to 1945 in the departments of Theoretical Physics and Cosmic Ray Research. He ushered a new era in Indian science after he took over the stewardship of the Atomic Energy Establishment, Trombay (AEET). Large numbers of young scientists who came under Dr Bhabha's spell saw a new life and a meaning in their dedication to science. Recipient of a number of Doctorate degrees from Indian and foreign universities, Dr Bhabha was on the advisory panel of many international scientific bodies. He was awarded Padma Bhushan in 1954.

In a resolution passed at a condolence meeting held at Delhi University on 25 January 1966, in which ISI participated, Dr Bhabha was described as 'a physicist of world fame and an administrator of science of the highest distinction'. The meeting expressed the hope that 'his example will continue to inspire students of science for many years to come'.

Importance of Standardization in the Present Context*

Dr T. N. Singh delivering the Presidential Address

■ It is my privilege to be with you today and preside over the inaugural function of the Ninth Indian Standards Convention. In my capacity as President of ISI, I would like to extend a hearty welcome to all the delegates who have come to participate in this Convention. I take this opportunity to welcome particularly the delegates from Iran, Thailand and UN who are in our midst today.

SELF-SUFFICIENCY THROUGH SELF-RELIANCE

At present, we are passing through a difficult period of our history. The recent ordeal has borne out the necessity for a close co-ordination between defence and development efforts. The nation has responded magnificently and in a disciplined manner to the needs of the situation. But, much remains to be done. There has to be a gearing of all sections of the community and all sectors of activity, public and private, to the tremendous job of achieving national self-reliance. Our aim today is maximum 'self-sufficiency' through maximum 'self-reliance', in every field, as we are faced with the need for reducing to a minimum India's dependence on other countries for capital and consumer goods. To achieve this national objective of paramount importance, we have to make concerted efforts to augment production and curtail imports both of industrial and agricultural products, promote exports and generally strengthen our production potential to enable us to face external aggression and internal economic problems. It is in this context that standardization activity in general and the Indian Standards Institution in particular can make a significant contribution.

In the field of industry, many steps have already been taken towards self-reliance which, as a matter of fact, has been the basic objective of India's planning for a decade and more. For instance, in the vital fields of steel production, oil exploration and refining, machine-building, transport and communications, and generation and distribution of power, we have taken big strides. Still I must say that in the past we have been relying overmuch on foreign collaboration and have been over-anxious to avail ourselves of foreign aid just because it was somehow readily forthcoming. There has to be a chastening of outlook in these matters now. Efforts will have to be made to make the fullest possible use of our industrial capacity and draw on our indigenous capabilities of technological skill. New industries have to be set up and new techniques evolved, which would result in avoidance of import or substitution of hitherto imported components by those indigenously produced.

While there may be some limit to what we can do in regard to substitution so far as basic raw materials are concerned, there is a vast scope for Indian technicians and engineers in regard to spares and components. At present, we are dependent on external supplies for a variety of spares,

*Text of the 'Presidential Address' delivered by Dr T. N. Singh, Union Minister of Industry, on 13 December 1965 at the Inaugural Function of the Ninth Indian Standards Convention held at Bangalore.

components and equipment to the tune of some Rs 2 000 to 3 000 millions a year, for continuing the production up to the capacities we have built up over the years. Continued production in these fields can only be facilitated by organizing an intensive programme of interchangeability of spares and components. And here standardization can be of great help. Standards furnish authoritative information and data of vital interest to industry, such as specifications for materials, dimensions, performances, finish, etc. Standards of size, shape and type which provide for ready interchangeability, enable assembly methods to be successfully adopted for mass production, minimize stock-piling and conserve transport resources. Besides, standardization results in economy of human effort, materials and machines, power and energy on the one hand and the combined economy of the producer and the consumer on the other. This over-all economy, in its turn, leads to maximum productivity. I have no doubt that in the context of our urgent need for import substitution and maximum utilization of our indigenous industrial capacities, ISI which has been engaged in the task of preparing national standards for the past about two decades, can and should and must play a very vital role.

FOOD FRONT

In the field of agricultural production, need for self-reliance is even more important. The recent events have brought in a new dimension to our food problem by facing us with the possibility of a break-down in our food supplies at a time when we are fighting for the very survival of our sovereignty. In the circumstances, there is no wonder that food production commands the highest priority in our plans for economic development. It hardly befits the self-respect of a nation with a total cultivated area of nearly 390 million acres and a net irrigated area of 70 million acres to be an importer of food-grains. We must achieve self-sufficiency in food at the earliest possible moment. In this field too, standardization can make significant contributions. Standardization has been adopted in most advanced countries to increase agricultural production. Standardization of agricultural implements and inputs like fertilizers, seeds, pesticides goes a long way in increasing the yield in a given area of cultivation. It is gratifying to note that ISI has formulated Indian Standards for agricultural implements, seeds, fertilizers, pesticides, storage structures and preservation processes. It is high-time that maximum benefit is derived from these standards. There is no doubt that standardization practised whether in the use of implements or inputs or conservation of produce, helps to increase productivity from the existing available resources by raising the output per acre. In view of the fact that short-fall of food supply in India is not more than ten percent, it should not at all be difficult for us to achieve self-sufficiency in this field through a wide-spread implementation of standards in every phase of production, transport, storage, preservation and usage of food products. I am, therefore, glad to find that one of the sessions of the present Convention is devoted to Implementation of Agricultural and Food Standards.

EXPORTS

Closely linked with import substitution and avoidance of imports is our need for export promotion. The basic requirements for maintaining our existing markets and creating new ones abroad is to win and continuously maintain the goodwill and confidence of our buyers. And, consumer confidence can readily be won through a vigorous application of quality standards. ISI's activity in establishing standards for various goods, therefore, represents an essential step in that direction. Implementation of the Indian Standards and the ISI Certification Marks Scheme, will improve the quality of goods whether meant for export or for home consumption.

For augmenting our foreign exchange earnings, however, the necessity to get exports inspected before shipment has been keenly felt by the Government as also by the trading circles. The year 1965 saw the introduction of an important and far-reaching measure concerning India's international trade. Following the recommendations of the Verman Committee on Quality Control and Preshipment Inspection, *the Export (Quality Control) Inspection Act* was placed on the Statute Book. A large number of export goods have now been brought under preshipment inspection and quality control under this Act. On 1 January 1965, Government of India declared jute hessian and sacking to require ISI Certification as a compulsory pre-requisite for export under the Act. I may also mention here that from 1 April 1965, a major part of steel for structural and other general purposes has also been covered by the ISI Certification Marks Scheme with the result that the value of total annual production of ISI Certified articles now stands roughly at Rs 3 500 millions. I am happy to find that one session which will be held under the chairmanship of my distinguished colleague Shri Manubhai Shah will be devoted to 'Standardization as a Tool for Export Promotion' while another will deal with 'Extending Usefulness of ISI Certification Marks'.

DEFENCE PRODUCTION

The present emergency calls for sustained effort to make our production defence-oriented so that we can become self-reliant in respect of our immediate and long-term needs for defence. Since at the moment we are faced with an uneasy truce, defence preparations have to be kept at a level where active hostilities can be promptly met. As you all know, standardization plays as important a role in the defence efforts of a country as indeed it does in the industrial and trade operations during normal peace times. In fact the need for standardization is even greater in organizing defence production in times of emergency, for it is highly important to have the production of defence equipment and weapons on carefully evolved specifications, which would ensure quick results and in which chief reliance is placed on materials and resources immediately available within the country. To make our production defence-oriented, therefore, we need today an extensive standardization activity coupled with more expeditious procedures and practices for the preparation of standards so as to achieve high over all productivity with maximum utilization of indigenous materials and resources. It is gratifying to note that ISI has not only been achieving its targets for the preparation of standards but sometimes even surpassing them. For example, the target of 500 standards stipulated for the last year of the Third Five-Year Plan was surpassed one year ahead of time. Still, I feel, that there is a pressing need for cutting down the average time of 52 months now being taken in preparing a standard from the stage of receipt of a proposal and 33 months from the point of taking up drafting. I believe the technical session on 'Expediting Preparation of

Indian Standards' which is to be held this afternoon will consider further ways and means to stream-line the procedures.

While talking of formulation of standards, I must make it very clear that this activity in itself cannot take us very far towards our goal of accelerated industrial growth. Of much more significance is the wide-spread implementation of standards. Ours is a democratic system. We prefer voluntary adoption of standards in all fields of economic endeavour, except when health, safety and export considerations are involved. A great responsibility, therefore, devolves on our industrial units throughout the country who, I think, stand to derive the maximum benefits from the implementation of national standards. Here it is pertinent to emphasize that the organized consumer is also in a strong position to set the pace for such implementation. If demand for standard items were large enough, producers would have to adjust their production programmes accordingly. It is encouraging to find that in our country purchases by the Central and State Governments are now based on Indian Standards, wherever such standards are available.

IN-PLANT STANDARDIZATION

While ISI has been doing commendable work in the field of formulating and promoting the use of national standards, I would like to point out that standardization effort of the country cannot be limited to ISI alone. Standardization must permeate each and every facet of our productive activity. All leading industries both in public and private sectors have to take up in-plant standardization at their own level. They must realize that we cannot go on in the old way with foreign collaborations, foreign aid and imports. They must also realize that the need of the hour is to maximize production through improvisation, adaptation, substitution and conservation. Optimum use has to be made of the large untapped reservoir of ability and technical knowledge obtaining in this great country of ours. Confidence has to be built in our own scientists, technologists and other specialists. And I think company standardization provides an excellent means for the achievement of these objectives. A well-organized company standards department should continuously address itself to the peculiar problems of the enterprise, concerned with substitution of imported materials and components, evolution of new designs, selecting special sizes and varieties of nationally standardized items for the individual use of the enterprise, limiting variety of components and materials going into production and products coming out of the factory, and so on. It is imperative, therefore, that consciousness of the potential of company standardization is created among the various industrial units. It has to be impressed upon them that company standards complement national standards and as such help us in building our industrial potential from the base upwards.

I am happy to note that ISI has been encouraging and helping Indian industries to produce their own standards by sponsoring various programmes for promoting the establishment of company standardization. Starting in 1963, these programmes have aroused considerable interest and more than 100 prominent industrial units in the country have already availed themselves of ISI's services in organizing their in-plant standards activity. This is a fair beginning. However, much more has yet to be accomplished. Our urgent need cannot brook any complacency in this matter. I am looking forward to a time in the foreseeable future when all prominent industrial units in the country, whether large or small, whether primary or ancillary, would have organized their own company standardization activity and that the public sector enterprises will give a lead in this matter.

INTERNATIONAL ACTIVITIES

To derive the utmost advantage from standardization, there has to be some sort of co-ordination between all the three levels of standardization practice, namely, company standards, national standards and international standards. I am gratified to find that ISI collaborates closely with international organizations like the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and others. Special mention may here be made of the Sixth Triennial General Assembly and Associated Meetings of the ISO held in New Delhi last year. On this occasion, ISO did the unique honour to India by electing as its President, for a three-year term, Shri Jehangir J. Ghandy, Vice-President of ISI and Chairman of its Executive Committee. This most significant event has laid special responsibilities on India and ISI in the context of our role in international standardization movement. We are happy to have Shri Jehangir in our midst on this occasion and hope to hear something about ISO from him.

In conclusion, may I remind you once again that the nation has set before herself the goal of self-reliance and self-sufficiency in every field. There is no going back. We must pursue this path continuously. There is no room for compromises; no scope for delays. This, in itself, emphasizes the urgent need for expeditious formulation and wide-spread implementation of more and mo e standards at every level. I am confident that the standardization activity in the country will be so stimulated as to play a progressively significant role in the achievement of our national objective of self-reliance.

I sincerely hope this Annual Standards Convention, which is aimed at promoting standardization movement in the country, will make important contribution to the future well-being of the nation.

I, therefore, take this opportunity to express, in my capacity as President of ISI, the gratitude of the Institution, to the State Government of Mysore and to you Sir, its Chief Minister for having given your full co-operation to us and to the All India Manufacturers' Organization, Bangalore who invited this Convention to Bangalore. My sincerest thanks are also due to the AIMO itself, to its Reception Committee and its Chairman, Shri Y.N. Gangadhara Setty for the excellent job they have done in making the necessary arrangements for the Convention.

I wish you all, every fruitful discussions.

Proceedings of Technical Sessions

In all, 189 papers were received for discussion at the nine technical sessions. The papers presented and discussed at each of the sessions are listed in the beginning of the session proceedings, which are reported in the following pages. The nine Technical Sessions were:

a) Expediting Preparation of Indian Standards (S-1)

b) Cost Reduction Through Standardization (S-2)

c) Extending Usefulness of ISI Certification Marks (S-3)

d) Implementation of Agricultural and Food Standards (S-4)

e) Standardization in the Field of Welding (S-5)

f) Crisis of Shortage of Building Materials (S-6)

g) Overseas Collaboration and Standardization in India (S-7)

h) Documentation and Library Housing (S-8)

j) Standardization as a Tool for Export Promotion (S-9)

S-I Expediting Preparation of Indian Standards

Chairman	Shri Inderjit Singh, General Manager, Hindustan Steel Ltd, Bhilai
Secretary	Shri B. N. Singh, Assistant Director (Statistics), Indian Standards Institution
Date	13 December 1965

PAPERS PRESENTED

S-1/1	Time taken for the formulation of an Indian Standard	Indian Standards Institution
S-1/2	Time taken for the formulation of an Indian Standard—Second study	Indian Standards Institution
S-1/3	Report from British Standards Institution on the time taken to develop national standards	British Standards Institution
S-1/4	Note on reducing the time taken for standardization work	N. T. Mathew, Ministry of Defence, New Delhi
S-1/5	Expediting preparation of Indian Standards through procedural changes	S. Subramu, Hindustan Steel Ltd, Ranchi
S-1/6	Time-factor in standardization—An O & M approach	R. K. Rangan, Ministry of Industry & Supply, New Delhi
S-1/7	Expediting preparation of Indian Standards with special reference to the standards on chemical analysis	A. Sangameswara Rao, Ferro Alloys Corporation Ltd, Shreeramnagar
S-1/8	Suggestions for speedy formulation of Indian Standards	S. S. Vaidyanathan, Kamani Metal & Alloys Ltd, Bombay
S-1/9	Suggestions for speeding up of standards	Naunihal Singh, National Physical Laboratory, New Delhi
S-1/10	A graphic technique to control the time taken in the preparation of Indian Standards	V. C. Jain, ISI, New Delhi
S-1/11	Expediting the drafting of standards	S. S. Honavar, Italab Private Ltd, Madras

OPENING REMARKS

■ In the absence (on tour abroad) of Shri S. S. Khera, who was to be the Chairman of the Session, Shri Inderjit Singh, the Discussion Leader, was requested to preside over and conduct the deliberations of the Session. Shri Inderjit Singh thanked the Indian Standards Institution for the honour accorded to him and expressed the hope that the discussion on the various papers contributed would be lively and fruitful.

PRESENTATION OF TECHNICAL PAPERS

Presenting the two papers entitled 'Time taken for the formulation of an Indian Standard (S-1/1 and 2)', Shri B. N. Singh stated that it was important to ensure speedy formulation of standards to accelerate the pace of standardization in the country. For this purpose, ISI conducted in 1961 the first study for estimating the time taken in the formulation of Indian Standards. The study surveyed the Indian Standards published during 1956-57 to 1960-61. The findings showed that the average time taken per standard was 70 months, the minimum being 13 and the maximum 163 months. One of the main reasons

for such a high average figure was the amount of time taken from the receipt of a proposal to initiation of drafting which was nearly 29 months or 41 percent of the total time. In other words, the processing time for a standard was 41 months. In the second study conducted four years after the first, during which time certain measures had been taken to speed up the formulation of standards, it came to light that the average time had fallen from 70 to 52 months. The average processing time for a standard had declined from 41 to 33 months.

Shri B. N. Singh said that ISI's first study had evinced great interest at the international level and the British Standards Institution and the Standards Association of Australia also conducted similar studies. The average processing time for the British and Australian Standards came out to be 36 and 37 months respectively as compared to 41 months for Indian Standards. India's experience which showed that about 40 percent of the total time taken was absorbed in dealing with matters from the proposal stage to the initiation of drafting was paralleled in the work of other organizations.

Presenting the 'Report from British Standards Institution on the time taken to develop national standards (E 1/3)', Shri B. N Singh said that the overall time taken for the processing of a British Standard came to 37 months and the maximum time was 11 years.

Shri N. T. Mathew, in his paper 'Note on reducing the time taken for standardization work (S-1/4)', stated that the formulation of an Indian Standard was a costly process. He suggested that ISI should undertake a further analysis to determine the optimum period required to formulate a standard taking into account the cost of standardization and the money value of the benefits which accrued from standardization. The cost analysis would have to be done separately for standards relating to different subjects and departments, so as to reveal the areas from which worthwhile economies might be expected.

Presenting his paper 'Expediting preparation of Indian Standards through procedural changes (S-1/5)', Shri S. Subramu suggested that after preliminary investigation of the proposal, the Director, ISI should be authorized to decide whether there was a need for a standard on the subject, and to refer it straightway to the sectional committee concerned, if it existed. The Division Council might, however, be informed of the action at its next meeting. Only if a new sectional committee was required to be constituted, the proposal should await the approval of the Division Council. The subcommittees, as far as possible, should be constituted from amongst the members of the sectional committees and their size kept as low as possible, subject to a maximum of three members. He further suggested that, wherever possible, the proposal for a new standard should be referred to or routed through a recognized association of producers, who may put up an agreed draft for consideration of ISI. This would induce the producers to adopt standardization both at the company level and national level.

In his paper 'Time-factor in standardization—An O & M approach (S-1/6)', Shri R. K. Rangan dwelt upon the usefulness of O & M (Organization and Methods) approach for reducing time taken in the preparation of standards. He suggested the creation of an O & M cell in ISI to undertake a detailed O & M investigation with a view to reducing the time taken in the preparation of Indian Standards. Broadly, the objectives of the O & M cell should be (a) to locate bottlenecks or points of congestion where the longest delays occurred and suggest remedial measures; (b) to study the methods and procedures in use all along the line with a view to simplifying or eliminating them; and (c) to study the distribution of staff responsibilities with attention to the type and quality of staff employed and recommend their optimum utilization.

Shri A. Sangameswara Rao, in his paper 'Expediting preparation of Indian Standards with special reference to the standards on chemical analysis (S-1/7)', stated that in the present state of rapid development of science and technology, the rate of preparation of standard should be commensurate with the rate of its demand. He mentioned that though the work of Indian Standards Institution in formulating standards since its inception was quite phenomenal, it was surprising to note that the average time taken for formulation of a standard was about six years, which was much against the common belief that formulation of a standard took about two years. Making certain suggestions to reduce the time taken in the formulation of standards, Shri Rao said that the Chairman of the sectional committee should be empowered to approve or reject the proposal, and in case of approval, he should be allowed to take necessary steps to appoint a subcommittee or panel for making the preliminary draft within a stipulated time of one or two months at the most. He suggested the appointment of one-man panels in place of larger sub committees for preparing preliminary drafts.

Presenting his paper 'Suggestions for speedy formulation of Indian Standards (S-1/8)', Shri S. S. Vaidyanathan suggested that, as far as possible, ISI itself should initiate standards. It

The Chairman, Shri Inderjit Singh, opening the Technical Session on 'Expediting Preparation of Indian Standards'. Others in the picture are (from l to r) Shri B. N. Singh, Secretary of the Session, and Dr Lal C. Verman, Director ISI

could derive assistance in its work from bodies like National Productivity Council. If the preliminary drafting was entrusted to outside agencies, meticulous care in the choice of personnel be exercised and a time limit for submission of the drafts be fixed and they should be made to follow the style prescribed in 'IS : 12-1964 Guide for drafting Indian Standards' with a view to lessening the burden on the Secretariat staff. He also suggested that to create enthusiasm within the ISI Directorate as also the outside representatives, some sort of incentive in the form of merit/performance certificate be introduced. He further suggested that the period of wide circulation could also be reduced to two months initially and to six weeks subsequently.

In his paper 'Suggestions for speeding up of standards (S-1/9)', Shri Naunihal Singh stated that a major portion of the gestation period was taken by the committee work which was the responsibility of the technical committee. Among the remedial measures suggested were frequent meetings of the sectional committees and subcommittees; publication by ISI of a new periodical called 'Standards Abstracts' containing bibliographic references on subjects covered by other standards organizations; proper composition of technical committees; better co-operation from industrial and trade concerns and consumer interests; promotion of company standardization activities; and frequent visits to industrial establishments by interested members of the technical committees.

Shri V. C. Jain's paper 'A graphic technique to control the time taken in the preparation of Indian Standards S-1/10)', which was presented by Shri B. N. Singh, described a method for planning, scheduling and controlling the time taken in the formulation of an Indian Standard. A time-table (or schedule) prepared on the basis of pre-determined realistic time-norms would provide an effective and easy instrument for controlling stage-to-stage development of a standard. The progress of the work done when plotted against the schedule on the time-control chart would immediately reveal the delays, if any. A critical review of the delays would also locate the bottlenecks and the remedial measures could be found out.

Shri S. S. Honavar in his paper 'Expediting the drafting of standards (S-1/11)', stated that to avoid delay in the preparation of the preliminary drafts, the drafting panels be given necessary assistance by the ISI Directorate by way of providing them with the translations of the relevant overseas specifications for their guidance. He felt that rationalization of certain steps common to the different standards and shortening of the wide circulation period would also expedite preparation of standards.

DR VERMAN'S REMARKS

Referring to the various suggestions made in the papers, Dr Verman explained that the Indian Standards were voluntary in nature unless and until the Government made them mandatory in a given field. In order, therefore, to acquire general acceptability of the standards by all concerned, their formulation had to be a time-consuming process involving consultation amongst members of the committee concerned. Development of some of the standards also required investigations and research which again consumed enormous time. In fact, the standards have to be properly balanced by taking into account the diverse interests and technological considerations so as to ensure maximum productivity and optimum utilization of the available resources. He then explained how adoption of standardization at the company level and the industry level, which was lacking in India, could simplify and expedite the preparation of Indian Standards. As regards the point raised by Shri Mathew about the determination of the optimum period for the preparation of a standard on the basis of the intersection of the curves for the cost of standardization and the national loss due to delay in standardization, Dr Verman stated that the latter in fact would be much more than the former and hence the two curves might not intersect at all.

DISCUSSION

Shri B. P. Sharma (FCI) suggested that preparation of regional standards on the basis of climatic and geographical conditions should be encouraged. Shri V. S. Bhatia (Siemens Engineering & Manufacturing Co of India Ltd, Bombay) suggested that the Secretary should invite suggestions for new subjects from the members of the committee well ahead of the meeting along with reasons to substantiate the need for a standard on the subject and desired the appointment of drafting panels consisting of two or three persons located in the same place.

Shri C. L. Handa (Central Water and Power Commission, New Delhi) stated that there was no lack of enthusiasm and sincerity on the part of members for standardization work; what in fact needed was proper communication amongst the members.

In reply to the point raised by Shri Honavar about the lack of uniformity in the test methods given in some of Indian Standards, Dr A. N. Ghosh said that the matter was under active consideration of the ISI Sectional Committee on Chemical Standards (CDC 1) under the chairmanship of Dr K. L. Moudgill.

Dr D. S. Bhatia (Coca-Cola Export Corporation, New Delhi) observed that the need for reducing the time in formulating Indian Standards need not be over-emphasized. However, sometimes speedy processing of the specifications became difficult because of lack of technical data for which experiments or research work had to

Shri N. T. Mathew presenting his paper on 'Reducing the Time Taken for Standardization Work'

be undertaken. He pointed out that proper choice of chairmen of the sectional committees, conveners of the subcommittees and members of the committees helped to a great extent in speedy formulation of the standards.

Shri Shivananda Swamy referred to the fact that many concerns had set up standards departments in their organizations and suggested that ISI might encourage meetings of standards engineers at industrial centres like Bombay, Calcutta, Madras, Bangalore and Ahmedabad.

Dr. Verman stated that a Standards Engineers Group was organized a couple of years ago in Calcutta which had since been registered as a Chapter of the Standards Engineers Society (SES) of America. Later on, a similar group was organized in Bombay and it was also registered as a Chapter of SES of America. These groups, however, had not been meeting at regular intervals. He had come to know that a similar group was also active in Madras. He felt that in due course it would be desirable to consider the possibility of establishing a Standards Engineers Society in the country itself to which all these groups could be affiliated and new branches opened in important industrial towns. He said that ISI was doing its best to train standards engineers for company standardization work with the cooperation of NPC and local productivity councils.

Col S. K. S. Mudaliar (Survey of India, New Delhi) emphasized the need to expedite formulation of Indian Standards and stated that when ISI could formulate Emergency Standards in two months and a half ensuring at the same time their quality, the other specifications could also be prepared in about five or six months. He suggested curtailment in the period of wide circulation, which was further reiterated by Shri S. K. Puri (National Physical Laboratory, New Delhi).

Emphasizing the need for speeding up the formulation of standards, Shri V. R. Ramaprasad (Bharat Heavy Electricals Ltd, Tiruchirapalli) suggested entrusting the preparation of preliminary drafts to the representatives of various industries, and observed that the drafts put up by them would be more practicable and consequently more acceptable.

Prof Dinesh Mohan (Central Building Research Institute, Roorkee) suggested that some sort of incentives be given to those who prepared the preliminary drafts. This would create interest in their work which would ultimately help in cutting down the time for formulating standards.

CONCLUDING REMARKS

Summing up the discussion, the Chairman observed that, while there was ample scope for cutting down the time, the formulation of Indian Standards was a creative and time-consuming process. It was more so particularly in a developing country. Though he did not favour reducing the period for wide circulation of the draft standards as suggested by some of the participants, he hoped that the various suggestions made at the Session for speeding up the formulation of Indian Standards would receive ISI's due consideration.

S-2 Cost Reduction Through Standardization

Chairman	Shri A. R. Palit, A. R. Palit & Company Private Ltd, 76 Sunder Nagar, New Delhi 11
Discussion Leader	Shri P. K. Roy, General Manager, Bennett Coleman & Co Ltd, Bombay
Secretary	Dr A. K. Gupta, Deputy Director (Implementation), Indian Standards Institution
Date	16 December 1965

Doc No.	Title	Author(s)
Group I		
S-2/1.1	Cost savings through in-plant standards on lubrication and lubricants — A case study	Hans E. Riebensahm, UNTAO Expert, Indian Standards Institution, New Delhi
S-2/1.2	PERT helps in cost reduction through standardization	H. Goswami, Hindustan Steel Limited, Rourkela (Orissa)
S-2/1.3	How many holes a second — A case study in standardization	K. Sathyanarayana & S. G. Tolpadi, Kirloskar Brothers Limited, Kirloskarvadi, Distt. Sangli
S-2/1.4	Establishment and implementation of a company standards programme	V. N. Mehta, Mahindra & Mahindra Ltd, Jeep Manufacturing Division, 5 Ferguson Road, Worli, Bombay 18
S-2/1.5	Cost reduction through standardization	M. P. Trivedi, Jyoti Limited, Baroda 3
S-2/1.6	Standardization via cost reduction	S. M. Sundara Raju & B. Banerjee, Indian Statistical Institute, Speed-A-Way Buildings, 35/5 Mount Road, Madras 2
S-2/1.7	Quality control by vertical standards	Curt Melzer, Blue Star Engineering Co (Bombay) Private Ltd, Lotus Court, Jamshedji Tata Road, Bombay 1
Group II		
S-2/2.1	How standardization helps cost reduction	M. R. Lodh, Devidayal Cable Industries Ltd, Gupta Mills Estate, Darukhana, Reay Road, Bombay 10
S-2/2.2	Standardization: An aid to the way of better and economic performance	M. M. Bandyopadhyay, The Indian Cable Co Ltd, Golmuri, Jamshedpur 3
S-2/3.1	Cost reduction in design and manufacture of jigs and tools through standardization	L. N. Tandon, Tata Engineering & Locomotive Co Ltd, Jamshedpur 4
S-2/3.2	Cost reduction through standardization	J. N. Malik, Chief Inspectorate (Vehicles), Ahmednagar
S-2/3.3	Cost reduction through standardization in automobiles	N. V. Meswani, The Premier Automobiles Ltd, Bombay Mutual Bldg, 10 Parliament Street, New Delhi

S-2/4.1	Cost reduction through standardization in alloy steels plant	Dr D. P. Chatterjee & Dr G. Mukherjee, Hindustan Steel Limited, Alloy Steel Project, Durgapur 8
S-2/9.1	Scope for cost reduction through standardization in thermal power stations	K. Sreedhara Rao, Central Water & Power Commission (Power Wing), West Block No. 2, R. K. Puram, New Delhi 22
Group III		
S-2/4.2	Standards for and tests of evaluating expellers	M. Allabaksh & S. D. Thirumala Rao, Oil Technological Research Institute, Anantapur
S-2/5.1	Cost reduction through standardization in building industry	K. N. S. Iyengar, Army Headquarters, Engineer-in-Chief's Branch, DHQ P.O., New Delhi 11
S-2/5.2	Cost reduction through standardization in mass housing programmes.	M. A. Hafeez & G. C. Mathur, National Buildings Organization, Nirman Bhavan, Maulana Azad Road, Exhibition Grounds, Mathura Road, New Delhi
S-2/6.1	Cost reduction through standardization with special reference to company standardization in fertilizer industry in India	S. Padmanabhan, The Fertilizers & Chemicals Travancore Ltd, P.O. Udyogamandal, Alwaye
S-2/7.1	Cost reduction through standardization	M. Bhimasena Rao & C. P. Anantakrishnan, National Dairy Research Institute, Karnal
S-2/8.1	Cost reduction through standardization in leather manufacture	Dr P. H. Rao, The Bata Shoe Co Pvt Ltd, Batanagar (W.B.)

OPENING REMARKS

■ In his opening remarks, Shri A. R. Palit, the Chairman, said that he was heartened by the number of papers submitted and the number of delegates present at the Session, which showed that there was no dearth of consciousness on the subject. The Session would be a momentous one if even a little headway was made in the direction of practical application. Emphasizing the role of standardization in yielding better value at less cost, he referred to Mr McNamara in USA, in recognition of whose work the Standards Engineers Society of America awarded him the Leo B. Moore Medal in 1963. The very fact that the next Leo B. Moore Medal was awarded to Dr Lal C. Verman, Director ISI, was a recognition that ISI, as an Institution, was well ahead in this task. However, ISI's work was mainly directed towards achieving economy at the national level; it was at the company level that standardization was yet to play its role in Indian industry. He felt that the main retarding factors for this lagging were pre-independence trading outlook displayed by some of the top managements of industry and the blind adoption of foreign collaborators' standards. The latter, he said, was responsible for the very large inventories carried by the Indian companies, which required immediate attention. Shri Palit said that the sales inventory ratio of Indian companies was one of the lowest and that was another indication of lack of standardization atpla nt level.

Commenting on the need for variety reduction, the Chairman said that during the last war, one of the first acts of the War Production Board in Washington was to reduce the varieties of tool steels and alloy steels from 1 000 to 93, with a view to increasing production and conserving scarce materials. Savings in down time of rolling mills as a result of the application of standards engineering, he said, were a significant achievement.

The discussion leader, Shri P. K. Roy, observed that very little standardization had been attempted by the paper industry. Paper sizes had been standardized by ISI but the industry had not yet adopted them with enthusiasm. Referring to the point raised in one of the papers about the manufacturers marketing similar products under different brand names, Shri Roy said that it might be a part of marketing strategy and the Session might usefully discuss that aspect.

PRESENTATION AND DISCUSSION OF TECHNICAL PAPERS

At the suggestion of Dr A. K. Gupta, Secretary of the Session, the papers were divided into the following three groups for discussion:

a) Group I—Papers S-2/1.1 to S-2/1.7

b) Group II—Papers S-2/2.1 to S-2/4.1 and S-2/9.1

c) Group III—Papers S-2/4.2 to S-2/8.1

Group I

The paper 'Cost savings through in-plant standards on lubrication and lubricants — A case study' was presented by Mr Hans E. Riebensahm. A medium size company in Germany, employing about 4 000 men, was using a large variety of lubricating oils and greases for its equipment and products. This led to high procurement costs as well as frequent breakdowns in the company's manufacturing equipment due to wrong use of lubricants. After the development of lubrication standards, it was possible for the company to reduce the types of lubricants from 179 to 25, effecting reduction of procurement costs by 50 percent and breakdowns in the company's manufacturing equipment from 29 to 2 per annum. These savings were possible only because of the organized standards activity in the company. To avoid confusion in the use of different brand names for similar products by manufacturers, Mr Riebensahm said that national standards for classification, testing and designation of certain mineral oils had since been developed by DNA.

Shri H. Goswami's paper 'PERT helps in cost reduction through standardization' gave application of Programme Evaluation and Review Technique (PERT) for the development of a number of process and maintenance standards in the Rourkela Steel Plant. In the pipe plant, when the size of pipe under manufacture changed, need arose to change the sets of rolls and electrodes. The maximum time taken for a change was 31 shifts and the minimum was 14 shifts. By using PERT network, the company developed a standard procedure to bring down roll changing time to 7 shifts only, without any additional capital

equipment. The benefit was estimated, on an average to be Rs 1·2 lakhs for every change in the size of pipe in the manufacturing schedule.

The paper 'How many holes a second — A case study in standardization' by Sarvashri K. Sathyanarayana and S. G. Tolpadi described that in their organization, development of company standards for machining operations like drilling, tapping and spot facing, provided basic data for planning and scheduling and for the operation of Incentive Bonus Scheme. These standards not only helped in reducing machine-set-up time but also effected improvements in quality and quantity of output per worker. Prior to the development of these standards, detailed time study was resorted to for each work and in this field alone it was estimated that the company profited to the extent of Rs 20 000 by saving in time required for work study in future.

In his paper 'Establishment and implementation of a company standards programme', Shri V. N. Mehta discussed the methods that could be adopted for development of company standards, the fields in which they could be profitably employed and the advantages that could be gained by such activities. Shri Mehta stressed upon 'documentation' as an important function of company standards programme.

Shri M. P. Trivedi's paper 'Cost reduction through standardization' referred to some examples of variety reduction through standardization in Jyoti Limited. Reduction of drill sizes from 150 to 99, studs from 159 to 90, pitch diameter combinations of screw threads from 63 to 52, and winding wire sizes from a large variety to a bare 15 were some of the cases cited.

The paper 'Standardization via cost reduction' by Sarvashri S. M. Sundara Raju and B. Banerjee pointed out that cost reduction and quality improvement were the real incentives in industrial undertakings. The paper contained two case studies. One of them referred to a case where standards for materials did exist but the costs were high. The other case study referred to a situation where standards for processes did not exist and the conventional efforts to determine them were beset with a number of practical difficulties. The paper dealt with the method employed to develop objective standards for both cases.

Mr Curt Melzer's paper on 'Quality control by vertical standards' explained the system of vertical standards and emphasized that the quality of a finished product depended as much on the quality and characteristics of the raw materials used as on the type of processes adopted, the chemical agents used and the quality of the intermediate products. The paper suggested that an analysis of the factors affecting the quality of the finished product at each stage of its manufacture and the simultaneous development of standards would be desirable.

Shri A. R. Palit initiating the proceedings of the Technical Session 'Cost Reduction Through Standardization'. Seated to his left are Shri P. K. Roy, the Discussion Leader, and Dr A. N. Ghosh, Joint Director ISI

Discussion

The discussion on this group of papers brought out that, for company standardization, management support was the first requirement; co-operation of other departmental heads was equally important as sometimes obstruction might be due to the feeling that an outsider was telling them what to do. Shri B. K. Sharma pointed out that all the case histories dealt with in the various papers were from large scale industrial units. Small scale industries were equally eager to introduce standardization and for this ISI should provide necessary assistance. Shri S. Natarajan felt that perhaps ISI might have a cell to assist small scale industries in solving their standardization problems. Shri M. S. Gurnani cited an instance where motivation brought about standardization. To compete with big firms in the manufacture and supply of electric cranes, they had standardized spans, speeds, horsepower of motors, gear boxes and various other components. As a result, they were able to reduce their design and estimation time and were now in a position to offer to any customer a standard crane within a reasonably short delivery time. Shri L. B. Ahuja highlighted some of the benefits derived through in-plant standardization effort at Rourkela Steel Plant. Shri H. C. Ramanna said that the idea of vertical standardization was a good one but advocated the concept of radial standardization according to which, starting from a point, attempt could be made to streamline the various operations. Dr N. Narasimhachari said that quality control in drug industry was a statutory obligation under which standardization and quality control could be enforced.

Group II

The paper 'How standardization helps cost reduction' by Shri M. R. Lodh advocated the introduction of standardization right from the time of planning for machinery and layout of the factory to achieve variety reduction, process simplification, etc. This would bring down the capital cost involved in building and maintenance as well as inventory carrying charges to the minimum. Shri Lodh cited an example where standardization of sizes of reels for finished cables resulted in 50 percent reduction in the inventory carrying cost.

Shri M. M. Bandyopadhyay's paper 'Standardization: An aid to the way of better and economic performance' gave a few examples from overseas experience on benefits through standardization and suggested that standardization could be very effectively utilized in increasing the efficiency of an enterprise.

Shri L. N. Tandon, in his paper 'Cost reduction in design and manufacture of jigs and tools through standardization', pointed out that not much attention had been given to the subject, and in the interest of national economy and efficiency, it was necessary that standards were formulated and implemented in this field. As the cost

of materials in the manufacture of jigs and tools was only 10 percent as against 90 percent for labour, there was a large export possibility of such items to Europe and USA where wages were 3 to 8 times higher.

The paper 'Cost reduction through standardization' by Shri J. N. Malik highlighted the ways and means by which cost reduction could be achieved through standardization and outlined recommendations to achieve the objectives.

Shri P. K. Roy opens the discussion. Dr A. K. Gupta, Secretary of the Session, is at extreme left

Drawing attention to possible fields of economy through standardization, Shri N. V. Meswami, author of the paper 'Cost reduction through standardization in automobiles', suggested that awards for good performance should be instituted to create the necessary incentive.

The paper 'Cost reduction through standardization in alloy steels plant' stressed that to achieve higher productivity it was essential to streamline the operations at all stages in alloy steel plants, limit the diversity of grades, sizes and tolerances, and develop test and inspection methods for specific requirements. Standards on melting methods, track time, specified heat ranges for cogging and hot working of blooms and billets, surface and conditioning method for semi-finished products, and sizes of blooms and billets, developed at Alloy Steels Project, Durgapur, were referred to.

In the absence of the author, Shri T. S. Sitapati presented the paper 'Scope for cost reduction through standardization in thermal power stations'. The paper discussed the possibilities of cost reduction through standardization in the design of thermal power stations and the equipment employed therein. He pointed out that power production in the country was expected to reach 23 million kilowatts by the end of Fourth Five-Year Plan and that the indigenous production of equipment for thermal stations was coming up. He, therefore, felt that the paper was timely as a sum of Rs 7 000 million was to be spent during the period for development.

Discussion

Shri Tolpadi accepted that standardization resulted in a great deal of cost reduction and financial savings, but explained that many a time there was a tendency to include all the techniques, which resulted in cost reduction, under the head of standardization. He desired a dispassionate discussion on the limitation of standardization. Shri S. Srikantiah cautioned against over-standardization.

Commenting on the statement of Shri Lodh that the cost of production was going up and the profit was diminishing, Prof P. K. Bose said that increase in cost of production was being passed on to the consumer and, therefore, profits were not diminishing. He said that if one wanted to reduce the cost of production in an industry, he had to take an overall view and not resort to standardization alone for maximum results.

Commenting on the paper 'Cost reduction through standardization in alloy steels plant', Dr A. N. Ghosh drew attention to the standards issued by ISI on alloy steels. He hoped that the Alloy Steels Plant at Durgapur would produce alloy steels to ISI specifications which have restricted variety to 60 types only as an emergency measure.

Group III

Authors of the paper 'Standards for and tests of evaluating expellers', Sarvashri M. Allabaksh and S. D. Thirumala Rao pleaded for developing objective standards for evaluating the performance of oil expellers along with test methods. Such standards would not only help the manufacturers but would also be of assistance to consumers.

Shri K. N. S. Iyengar's paper 'Cost reduction through standardization in building industry' emphasized that standardization should commence right from the beginning of national projects.

The paper 'Cost reduction through standardization in mass housing programmes' by Sarvashri M. A. Hafeez and G. C. Mathur stressed the need for undertaking studies to highlight the impact of standardization on housing programmes. The impact of modular co-ordination on cost reduction in housing was brought out and the advantages of off-site fabrication of standard components and prefabrication in mass housing programmes were mentioned. Shri Mathur pointed out wide variations in costs in housing programmes provided in the various township projects and expressed the need to narrow down such variations by application of standardization and rationalization.

Shri S. Padmanabhan, in his paper 'Cost reduction through standardization with special reference to company standardization in fertilizer industry in India', discussed the benefits enjoyed by Fertilizers and Chemicals Travancore Limited through standardization of various manufacturing processes, plants and equipment over the past two decades. To meet the fertilizer target of two million tonnes of nitrogen and one million tonnes of P205 per annum by 1971, the author recommended standardizing the capacity of 'naphtha steam reforming process' followed by standard sizes of ammonia plants along with standard complex fertilizer units.

In their paper 'Cost reduction through standardization', Sarvashri M. Bhimasena Rao and C. P. Anantakrishnan stressed the importance of establishing standards in different spheres from the initial stages of design and manufacture, to make production most economical. Some salient points to achieve the objectives of cost reduction through standardization with special emphasis on food and dairy industry were discussed in the paper.

Dr P. H. Rao, in his paper 'Cost reduction through standardization in leather manufacture', explained the difficulties experienced in the leather industry due to lack of availability of standard chemicals, dyestuffs and fat liquors.

Discussion

The discussion on this group of papers started with Lt-Gen H. Williams's reference to the reluctance of architects to use modular co-ordination concept. Their excuses were that modular bricks and modular components were not available. Regarding standardization of sizes of rooms, he felt that it was a matter which should be left to the discretion of the architects. Lt-Gen Williams also wanted to dispel the notion that identical houses built in housing blocks were monotonous. Dr H. C. Visvesvaraya (ISI) suggested that standards cells manned by trained personnel would remove the bottleneck in the implementation of standards in the building industry. He added that ISI would be glad to provide training facilities for the purpose. Shri S. G. Ramachandra suggested that architects should try to economize in the use of doors and windows as well as eliminate unnecessary projections which were not of utility value. Shri T. R. Alurkar stated that as in Japan if standardized parts were manufactured by small scale industries and supplied to large industries, it would reduce the cost and improve the quality. Shri V. K. C. Iyengar described briefly how through proper organization and standardization Border Road Development Board had been able to construct roads economically leading to a saving of nearly 50 percent in time alone. Shri S. Y. Gore complained about the quality of cement available to the consumer. He felt that if the packing was standardized, it would avoid sapping of cement and that alone would save to the extent of 5 to 7 percent of cement.

Referring to Shri Tolpadi's point about the limitation of standardization, Dr A. K. Gupta explained that motivation for company standardization was no doubt cost reduction. To achieve the objective, standardization provided (a) means of communication to avoid confusion, (b) solutions for recurring problems to avoid repeated working, and (c) means for variety reduction for economic operation. The mechanism through which the system operated was by developing company standards, containing company decisions on relevant issues and by making them available to all concerned for guidance and compliance. Dr Gupta added that standardization was a service function and could never replace the function itself. For example, the standards on drafting practices aimed at achieving common understanding and clear interpretation of the description, but they did not deal with what the description should be. Similarly, company standards on parts aimed at maximum use of the parts within the company and provided means for restricting varieties, thereby economizing on design, manufacturing, scheduling, etc. These standards have thus an effective role in designing activity but they were distinctly different from that of designing itself.

CONCLUSION

Concluding the discussion, Shri P. K. Roy, the Discussion Leader, distinguished between cost reduction and price reduction. He said that standardization definitely played a vital role in the former but so far as the latter was concerned other economic forces played their part and naturally standardization had limited applications.

Summing up the discussion, Shri A. R. Palit said that the question of diversification versus variety reduction had been raised many times. He felt that in emergency nine times out of ten answer will be in favour of variety reduction whereas diversification could be had always in times of peace. The Chairman quoted various instances where cost reduction had been achieved through standardization in UK and USA during the last war. He felt that the distinction between radial and vertical standardization was only academic because functionally standardization had applications in all fields, namely, design, planning, distribution, store, inventory control, purchasing, material handling, value analysis and quality control. Emphasizing the need to be fanatic about standardization under the prevailing circumstances, Shri Palit pointed out that the cost reduction achieved by Mr McNamara was nearly 1/4 by standardization.

The Session concluded with a vote of thanks to the Chair, Discussion Leader and to the delegates, proposed by Dr A. N. Ghosh, Joint Director ISI.

S-3 Extending Usefulness of ISI Certification Marks

Chairman	Shri Prabhu V. Mehta, Director, Calico Dyeing & Printing Mills Private Ltd, Bombay (*Morning Session*) Dr Lal C. Verman, Director ISI (*Afternoon Session*)
Secretary	Shri D. Das Gupta, Deputy Director (Laboratories), Indian Standards Institution
Date	15 December 1965

PAPERS PRESENTED

S-3/1	Certification Marking — A national interest	Dr S. Krishnamurthy, Indian Telephone Industries Ltd, Bangalore
S-3/2	Usefulness of ISI Certification Mark for domestic and export market	M. R. Lodh, Devidayal Cable Industries Ltd, Bombay
S-3/3	ISI Certification Mark for electrical goods	V. S. Bhatia, Siemens Engineering & Manufacturing Co of India Ltd, Bombay
S-3/4	Usefulness of ISI Certification Marks — A review with particular reference to engineering equipment	S. G. Ramachandra, Kirloskar Electric Co Ltd, Bangalore
S-3/5	Extending usefulness of ISI Certification Marks	Dr B. R. Deoras, Durgapur Steel Plant, Durgapur
S-3/6	ISI Certification Scheme — Its effectiveness and its impact on consumers	V. R. Sankaran, Cable Corporation of India Ltd, Bombay
S-3/7	Safeguarding of consumers' interests (value of mandatory use of Certification Marking)	M. R. Verma, National Physical Laboratory, New Delhi
S-3/8	Use of statistical techniques in extending usefulness of ISI Certification Marks	N. T. Mathew, Ministry of Defence, New Delhi
S-3/9	ISI Certification Marks — Critical study and suggestions for improvements	J. R. Nahar, The Premier Lighting Industries Private Ltd, Bombay
S-3/10	Extension of usefulness of ISI Certification Marks in India and abroad	M. B. Desai, The Kesar Sugar Works Ltd, Bombay
S-3/11	A critical study of ISI Certification Marks Scheme	B. K. Mukherjee, National Test House, Calcutta

OPENING REMARKS

■ In the absence due to indisposition of Shri S. S. Jagota, who was to preside over this Session, Shri Prabhu V. Mehta, Chairman of the Certification Marks Advisory Committee of ISI, was requested to take the chair. In his opening remarks, Shri Mehta said that though the subject matter of the Session was somewhat controversial, he was sure that there would be no difference of opinion among the right thinking persons about the usefulness of Indian Standards and the ISI Certification Marks Scheme.

PRESENTATION AND DISCUSSION OF TECHNICAL PAPERS

The papers were presented and discussed under two groups. The first group of five papers (S-3/2, 3, 4, 6 and 11) mainly dealt with the significance of 'quality', restriction of the ISI Certification Marks Scheme to only consumer goods, and dual function of ISI, that is, standards formulation and certification marking. The second group comprising six papers (S-3/1, 5, 7, 8, 9 and 10) mainly dealt with the certification marking of items affecting human safety and health, and usefulness of ISI Certification Mark for domestic and export markets.

Group I

Shri M. R. Lodh, in his paper 'Usefulness of ISI Certification Mark for domestic and export market' (S-3/?) explained how the ISI Mark was useful to manufacturers as well as consumers. He stated that the ISI Mark was a mark of quality and as a third-party guarantee it helped in winning the confidence of the consumer as the article was manufactured under controlled conditions to conform to the requirements of the relevant standard. However, since the Indian Standard prescribed quality at the minimum level, the ISI Mark led to the tendency of just satisfying the minimum requirements, thereby leaving little scope for superior quality products. To overcome this shortcoming, Shri Lodh suggested that some sort of incentives by way of national awards, prizes, etc, may be introduced for those manufacturers who always surpassed the minimum level of requirements. He further observed that for establishing export markets on a solid foundation, maintenance of quality was an essential pre-requisite, and the setting up of the Export Inspection Council and enactment of *The Export (Quality Control and Inspection) Act* was a wise step. While stressing the need for making the Certification Mark compulsory for all items of export, he recommended that certification marking should also be compulsory for items concerning human health and safety, such as electrical appliances, baby foods and tinned foods. Pointing out that the scope for the usefulness of the ISI Certification Mark was vast, Shri Lodh suggested that manufacturers should tighten their quality control measures, ISI Directorate should arrange for more frequent inspections, and consumers should occasionally check and report conformity of certified products to manufacturers and to ISI.

Presenting his paper 'ISI Certification Mark for electrical goods' (S-3/3), Shri V. S. Bhatia put forth the viewpoint that the ISI Certification Marks Scheme for non-consumer goods was neither practical nor economical. The large scale consumer generally had his own technical set-up to test the purchased product and as such he regarded as unnecessary the payment of a higher price for certified products. However, for mass-produced goods for layman, certification had a great role to play in assuring the performance; ISI Certification should, therefore, be compulsory for consumer goods. He also observed that the ISI Certification Mark should be considered to signify only compliance with the relevant Indian Standard; no 'quality' should be associated with it, as consumers' conception of 'quality' included factors, such as robustness, ease of installation and maintenance, and facility of after-sales-service, which could not be fully specified in Indian Standards. He also suggested that the job of quality control for exports should be entrusted to another organization which should be in a position to certify products according to specifications of the purchasers; the organization could have representatives from ISI, industries and consumers.

The paper 'Usefulness of ISI Certification Marks — A review with particular reference to engineering equipment' (S-3/4) was presented by Shri S. G. Ramachandra. He discussed the meaning of 'quality' in relation to engineering equipment and the extent to which the quality of the product could be reflected in national standards. Shri Ramachandra endorsed the viewpoint that certification on the basis of compliance with national standards did not signify quality but only compliance with the relevant standard at the time it was tested. The ISI Mark could, therefore, hardly satisfy the customer who wanted reliability which could be ensured only by manufacturers and not by a third party. While reviewing the progress of the ISI Certification Marks Scheme, he made the following suggestions:

a) For engineering equipment where life and reliability were important there should be no certification;

b) ISI Certification should be confined only to consumer goods and articles where safety of the general consumer is involved;

c) Free use of national mark may be permitted to all manufacturers who were members of ISI, thereby encouraging them to take more technical interest in ISI work and financially assist the Institution to cope with this work;

d) Certification fee derived from selected products should be used

A delegate expressing his views on 'Extending Usefulness of ISI Certification Marks'. Seated to his left are Shri D. Das Gupta, Secretary and Shri Prabhu V. Mehta Chairman of the Session; and Dr Lal C. Verman, Director ISI

exclusively for those very products; and

e) Certification marks may be issued to those manufacturers whose previous experience was available for assessment by the Certifying Authority.

Introducing his paper 'ISI Certification Scheme — Its effectiveness and its impact on consumers' (S-3/6), Shri V. R. Sankaran complimented ISI for the laudable work done ever since its inception. He said that though certification by ISI did not mean that the product had optimum quality, but it did make the job of the discriminating buyer easy, for the Certification Mark assured basic quality. He pointed out that some large scale consumers continued to have their own inspection even for the certified products, arguing that ISI Certification did not mean 100 percent inspection. This, in his view, caused unnecessary additional strain on the manufacturers due to re-testing. He emphasized that ISI Certification should be considered only as a technical audit as the main responsibility of maintaining the standard rested with the manufacturer himself. Shri Sankaran also made some suggestions for better propagation of the Scheme — these included rejuvenation of the Consumers' Association of India and greater publicity of ISI.

Presenting his paper 'A critical study of ISI Certification Marks Scheme' (S-3/11), Shri B. K. Mukherjee described the work undertaken by ISI under its Certification Marks Scheme as stupendous. In a vast country like India, it was rather difficult for a single organization to run such a scheme for a large variety of items. He, therefore, suggested that ISI Certification should be restricted to certain groups of materials, and zonal organizations should be established with fully equipped laboratories manned by highly qualified technical personnel for the type of industry developing in that particular zone. ISI, as the national standards organization, could have free access to the various technical and scientific findings of such zonal laboratories. He also observed that the dual role of ISI — formulation of standards and certification — was not in national interest, and suggested that the certifying authority should be vested in a separate organization independent of ISI. In this connection, he referred to the role being played by the National Test House.

Discussion

Disagreeing with the suggestion that ISI Certification may be restricted to consumer goods only, Dr Y. K. Subrahmanyam (Ministry of Health) said that according to his experience, Certification Marking was as necessary for engineering equipment as for the consumer goods. Appealing to the industry to adopt the ISI Mark, he mentioned that there were bound to be initial difficulties but they all would be resolved in due course. He also observed that like certain popular brands, ISI Mark, if adopted by the industry, would also build up in due course its reputation for quality. He deprecated the tendency of manufacturers to produce cheap goods completely forgetting the quality aspect.

Shri Suryanarayanan [M/s Omega Insulated Cable Company (India) Ltd] endorsed the suggestion of Shri Lodh that the manufacturers who produced goods of a quality superior to that stipulated in Indian Standards should be encouraged through some sort of incentive.

Shri B. K. Sharma (Department of Industries, Delhi Administration) observed that the papers indicated unanimity on the desirability of introducing Certification Marking in as wide a field as possible. He, however, felt that the work involved would be stupendous and ISI should, therefore, fix priorities; for instance, export-potential articles could have the first priority followed by foodstuffs and electrical appliances. He mentioned that small scale manufacturers were keen to have the ISI Mark but the fees charged by ISI came in the way. He, therefore, suggested that for the small scale sector, certification fee should be quite nominal. He also supported the proposal that manufacturers who improved quality of their products should be encouraged through incentives but did not favour compulsory ISI Certification.

Disagreeing with the suggestion of Shri B. K. Mukherjee, Shri R. S. Misra (Batala Engineering Co Ltd, Batala) said that the functions of formulating national standards and certification should be vested in only one organization, as it facilitated rectification, if necessary, during certification. Shri V. S. Bhatia (Siemens Engineering & Manufacturing Co of India Ltd, Bombay), and Shri V. R. Subramanian (Indian Oxygen Ltd, Calcutta), however, felt that these two functions should be the responsibility of two different organizations. It was feared that for promoting certification, ISI might be tempted to relax the requirements of the relevant Indian Standards.

Speaking on the quality of paints, Shri G. E. Norris (Goodlass Nerolic Paints Private Ltd, Bombay) remarked that certification marking fee was much higher than the testing fee charged by the National Test House.

Shri K. N. P. Rao (Tata Iron & Steel Co Ltd, Jamshedpur) stated that the ISI Certification for steel was a progressive step and even the re-rollers were now recognizing its advantages.

Dr N. Narasimhachari (Hindustan Antibiotics Ltd, Poona) emphasized that the Certification Mark was not an end in itself but it was only a technical audit.

Replying to the various points raised by the speakers, the Chairman said that it has been suggested even earlier that some kind of incentive, such as award of a title, may be given to manufacturers who excelled in exports. But most of the manufacturers including himself held the view that it was the responsibility of the producer himself to enhance the exports of the country and hence no incentive was called for; in fact, consumers' confidence itself was an excellent award for a manufacturer. Referring to the suggestion for a separate organization for quality control for export items, he informed that as recommended by the Verman Committee, the Government of India had already set up the Export Inspection Council and a number of products had already been brought under compulsory quality control and pre-shipment inspection. With regard to re-inspection of ISI certified products by DGS&D inspectors, the Chairman informed that ISI was in touch with DGS&D, and it was hoped that DGS&D would agree soon. Concerning the marking fee charged by ISI, the Chairman pointed out that it was quite nominal and it did not add to the cost of the product.

Group II

Presenting his paper 'Use of statistical techniques in extending usefulness of ISI Certification Marks' (S-3/8), Shri N. T. Mathew stated that there were many ways in which statistical techniques could help in extending the usefulness of ISI Mark. Two of these were: the application of SQC methods in the production of goods, and sample surveys for market research to find out the relative popularity of different makes, both certified and non-certified. He explained that SQC techniques, such as control charts, design of experiments and sampling enabled the manufacturer to control production process, and

suggested that ISI should permit the use of ISI Mark only to those manufacturers who applied SQC. Presenting the results of a small pilot survey conducted by him in some of the markets of Delhi, Shri Mathew remarked that many shopkeepers had not even heard of the ISI Mark. He, therefore, suggested that a well-planned all-India survey may be conducted to encourage the wide use and acceptance of the ISI Mark.

On the introduction of SQC techniques in factories of ISI licensees, Shri B. N. Singh (ISI) informed that every licensee under the ISI Certification Marks Act had to follow a scheme of testing and inspection based on the principles of SQC techniques. He added that for licensees, ISI had even started training programmes on SQC methods and one such programme had already been held at Bombay for the pesticides industry.

Dr Verman said that the results revealed by the market survey were very educative and suggested preparation and distribution of leaflets highlighting the significance of ISI Mark to distributors, retail sellers, etc.

Presenting his paper 'Extending usefulness of ISI Certification Marks' (S-3/5), Dr B. R. Deoras said that the ISI Mark had already been recognized as a hallmark for quality, and by bringing steel products under the Scheme, its benefits were now being extended to one of the most vital fields of manufacture. However, the Scheme could be made more useful by:

a) Elaborating the details of testing and inspection annexed to the licence;

b) Undertaking extensive technical audit through sampling and testing of steel and steel products from the market;

c) Formulating new specifications to cover special steels; and

d) Making available to customers and manufacturers authentic data on the properties of all special steels which bear the ISI Mark.

Presenting his paper 'Certification Marking — A national interest' (S-3/1), Dr S. Krishnamurthy said that the ISI Mark was a boon to the consumer as it protected him from spurious goods. He explained that requirements of Indian Standards indicated the 'quality' level and as such ISI Mark was a mark of quality. Purchasing organizations should, therefore, indent goods according to Indian Standards and prefer certified goods. He also pleaded for incentives, such as increase in the quota of raw materials, concessions in excise duty for manufacturers of certified products, exemption of ISI certified goods for export from preshipment inspection, and wider publicity in overseas countries to educate the buyer about the usefulness and advantages of the ISI Mark.

Introducing his paper 'Safeguarding of consumers' interest (value of mandatory use of Certification Marking)' (S-3/7), Shri M. R. Verma stated that with the improvement in standards of living, new types of products were entering the Indian homes. Although Indian Standards covering safety requirements had been laid down in several cases, the market was still flooded with sub-standard products which did not meet essential safety requirements. Citing three cases, namely, hair darkening solution, water heater and spoon, the author said that the consumer was quite often unable to discriminate and, therefore, on the lines of steps taken by other countries the following remedial measures may be taken:

a) Compulsory certification marking wherever standards existed;

b) Appropriate steps for developing quality consciousness in the consumer; and

c) Setting up of laboratories more specifically designed for testing and research work on consumer goods.

High-lighting the salient points of his paper 'ISI Certification Marks — Critical study and suggestions for improvements' (S-3/9), Shri J. R. Nahar said that the ISI Certification Marks Scheme was useful for consumers as well as for small scale and medium scale manufacturers. He suggested the following measures to avoid the delay encountered while obtaining the Mark:

a) In technical committees, manufacturers (small scale, medium scale and large scale having proportionate representation), inspection departments, consumer organizations and associations should have a balanced representations; and

b) If possible, testing may be carried out at the premises of the factory in the presence of a representative of ISI.

He also suggested gradation in quality for certified items on the Polish pattern and only one central body for issuing the quality mark. He observed that in India there were many quality marks issued by different bodies, and this defeated the very purpose of standardization in general and ISI Certification in particular.

Introducing his paper 'Extension of usefulness of ISI Certification Marks in India and abroad' (S-3/10), Shri M. B. Desai observed that the ISI Certification Marks Scheme was generally in line with the recommendations made by ISO and the Commonwealth Standards Conference. Reviewing the progress made by ISI with regard to formulation of Indian Standards and issuing certification marks, he made the following suggestions:

a) ISI Mark may be made mandatory for products affecting human health and safety;

b) Quality consciousness should be aroused through press, documentaries and lantern slides; and

c) More testing laboratories may be recognized for testing samples.

As regards overseas consumers, he suggested propagation of all information through participation in international exhibitions, through trade representatives and embassies, and by sending trade delegations in which representatives of industries and leading business houses interested in export of quality goods could also be included.

CONCLUSION

Replying to the various points which came up for discussion, Dr Verman said that the world opinion was not in favour of having two organizations — one for preparation of national standards and the other for certification. The Technical Committee of the International Organization for Standardization 'ISO/TC 73 Marks Indicating Conformity with Standards' had come to the conclusion that it was in the interest of national economy that these two functions be vested in only one organization, and this recommendation had been accepted by all the ISO member bodies.

With regard to certification of thousands of varieties of products, by one organization, Dr Verman observed that whenever ISI could locate any competent organization to handle the detailed inspection and quality control of products of its licensees, it had been recommending to the Government of India for appointing that organization as the Competent Authority under the *ISI Certification Marks Act*. Thus, quite a large number of competent authorities had already been appointed for several products. He explained that though the licences were issued by ISI in such cases, the inspection work was

carried out by the competent authorities; ISI, however, reserved the right to supervise the operations of the Scheme.

Concerning ISI licences in respect of non-consumer goods, Dr Verman stated that though there might be some justification in favour of not granting a licence, yet ISI under the provisions of the *ISI Certification Marks Act* could not refuse a licence to the manufacturer who approached ISI for a licence. Regarding certification marking fee, Dr Verman explained that the fee was related to the amount of expenditure in testing; if the tests were expensive and too many, naturally the expenditure was high and so was the marking fee.

In regard to compulsory marking of consumer goods Dr Verman explained that ISI Certification Marks Scheme was voluntary. However, so far as products affecting human health and safety were concerned, ISI had already approached the Government of India for taking suitable measures.

S-4 Implementation of Agricultural and Food Standards

Chairman	Dr Y. K. Subrahmanyam, Assistant Director General of Health Services, Ministry of Health, New Delhi
Secretary	Shri G. S. Vilkhu, Extra Assistant Director (Agriculture and Food), Indian Standards Institution
Date	14 December 1965

PAPERS PRESENTED

S-4/1	ISI Certification Mark and Agmark as means for implementing standards	Dr. C. P. Anantakrishnan, Dr M. Bhimsenrao, and Dr Noshir N. Dastur, National Dairy Research Institute, Karnal
S-4/2	Need for mandatory standards and certification in well-defined fields to ensure safety and health and to promote exports	V. P. Anantanarayanan and V. Chandramouly, Directorate of Marketing and Inspection, Nagpur
S-4/3	Grading of produce	K. Subba Rao, Directorate of Marketing, Hyderabad
S-4/4	The press and the promotion of national standards in agriculture and allied fields	S. G. Ranade, Directorate of Marketing and Inspection, Nagpur
S-4/5	Introduction of bacteriological standards for grading of dairy products	Dr H. Laxminarayana and Dr Noshir N. Dastur, National Dairy Research Institute, Karnal
S-4/6	Scientific means for the reproduction of physical standards for sugar	S. C. Gupta, N. C. Varma and N. A. Ramaiah, National Sugar Institute, Kanpur
S-4/7	Analytical difficulties in the implementation of standards for sucrose	Dr B. R. Roy and A. K. Dhar, Central Food Laboratory, Calcutta
S-4/8	Assessment of quality and grading in sugar industry	S. C. Gupta, and N. C. Varma, National Sugar Institute, Kanpur
S-4/9	Preparation and implementation of Indian Standards for improved agricultural implements	D. N. Kherdekar, Directorate of Extension, Ministry of Food & Agriculture, New Delhi
S-4/10	Rational approach to the standardization of the agricultural implements in India	Dr M. P. Sinha, Department of Agriculture, Patna
S-4/11	Standardization in foodgrain industry	Dr S. V. Pingale, Ministry of Food & Agriculture, New Delhi
S-4/12	Necessity for standardization in the field of fruit and vegetable preservation	Dr G. S. Siddappa, Central Food Technological Research Institute, Mysore
S-4/13	Some thoughts on standardization of Indian slaughter houses	Dr S. K. Barat, Central Leather Research Institute, Madras

OPENING REMARKS

■ Dr A. N. Ghosh, Joint Director ISI, informed the delegates that Shri T. Anant Pai, Chairman, Food Corporation of India, had conveyed his inability to preside over the Session due to his preoccupation at the Chief Ministers' Conference in New Delhi. Dr Ghosh, therefore, requested Dr Y. K. Subrahmanyam to take the Chair.

Dr Y. K. Subrahmanyam welcomed the delegates and thanked the Indian Standards Institution for according him the honour to preside over the Session. Underlining the importance of the subject under discussion the Chairman pointed out that the Session was the best forum for assessing, evaluating and deciding on measures for getting over food shortage through effective implementation of the agricultural and food standards. Praising the contribution of ISI for improving the quality of manufactured products, Dr Subrahmanyam said that out of the 3 200 Indian Standards formulated so far, more than 350 dealt with the agricultural and food products. Standards, he felt, were very essential in order to prevent misbranding, mislabelling and to ensure the identity of the quality of products. They should be acceptable to all as they were developed with the constant association of the producer, the manufacturer and the consumer at all stages during their formulation. Referring to the ISI Certification Marks Scheme, the Chairman pointed out that a certain amount of responsibility rested upon the manufacturers to manufacture quality goods. He was of the opinion that to effectively implement the Scheme, a demand for standard products could be created by organized consumer movements.

The Chairman also referred to the various statutory regulations like the *Agricultural Produce (Grading and*

S-4/14	Quality control for fish and fishery products	M. P. Devasundaram, Department of Food, Ministry of Food & Agriculture, New Delhi
S-4/15	A study of the quality of dried white bait in the trade	R. Srinivasan, N. Sabapathy and K. C. Joseph, Fisheries Technological Station, Tuticorin
S-4/16	Quality of commercial frozen lobsters in relation to standards	Cyriac Mathen and D. R. Chaudhuri, Central Institute of Fisheries Technology, Ernakulam
S-4/17	The relationship between product quality and bacterial load in frozen prawn products	T. S. Gopalakrishna Iyer and Dr V. K. Pillai, Central Institute of Fisheries Technology, Ernakulam
S-4/18	Chemical quality of common salt used in the fish curing industry in Madras State	R. Srinivasan, K. C. Joseph and P. Pitchaiah, Fisheries Technological Station, Tuticorin
S-4/19	Mandatory standards for spices and condiments — Their enforcement	S. N. Mitra, Central Food Laboratory, Calcutta
S-4/20	Testing of seeds of economic plants with reference to purity and viability for fixing minimum seed standards	Amir Singh, Indian Agricultural Research Institute, New Delhi
S-4/21	Fertilizer standards and implementation	T. Gopalan Nayar, The Fertilizers and Chemicals Travancore Limited, Alwaye
S-4/22	A case for trace elements in India's fertilizer programme	V. R. Mallikarjuneswara, Ramaswami Ayyar Research Laboratory, Bangalore
S-4/23	Effect of accelerated drying and sun drying on the storage behaviour of groundnut pods	S. Ansar Ahmed, D. Ramachar, M. Allabaksh and S. D. Thirumala Rao, Oil Technological Research Institute, Anantapur
S-4/24	Studies on the cold storage of Indian rice bran and rice bran oil	J. S. Kumar David, S. Kutumba Rao, S. D. Thirumala Rao, and K. S. Murti, Oil Technological Research Institute, Anantapur
S-4/25	Increased agricultural productivity through standardization	G. K. Nayar, National Productivity Council, New Delhi
S-4/26	Role of technology in the formulation of tobacco standards	Dr M. S. Patel, Tobacco Export Promotion Council, Madras

Marking) *Act*, 1937, the *Fruit Products Order* (*FPO*), *1955* and the *Prevention of Food Adulteration Act* (*PFA*), *1954* which prescribe minimum specifications for the raw agricultural produce, the fruit products and the foodstuffs sold in the market. He pleaded for a closer co-ordination between ISI and these statutory regulations as they could be effectively used as one of the means for implementing Indian Standards.

Dr Subrahmanyam also laid emphasis on the necessity to improve the quality of exported goods so that we could continue to gain ground in the overseas markets. He welcomed the enactment and enforcement of the *Export* (*Quality Control and Inspection*) *Act*, *1963* which had started showing salutory effect to enhance the reputation of the Indian goods.

PRESENTATION AND DISCUSSION OF TECHNICAL PAPERS

For facility of discussion, the papers dealing with similar subjects were presented in groups as follows:

a) Standards and Certification of Goods (S-4/1 to 3)

b) Sugar Standards (S-4/6 to 8)

c) Agricultural Implements (S-4/9 and 10)

d) Fish and Fisheries (S-4/14 to 18)

e) Fertilizers (S-4/21 and 22)

The remaining papers (S-4/4, 5, 11 to 13, 19, 20 and 23 to 26) were presented individually.

Standards and Certification of Goods

Presenting the paper 'ISI Certification Mark and Agmark as means for implementing standards (S-4/1)', Dr Bhimsenrao suggested that in order to ensure the availability of tested and certified goods to the consumer, it was necessary that the ISI Certification Mark and the Agmark be popularized. In addition, the author recommended that ISI and the Directorate of Marketing and Inspection (DMI) should operate counselling and voluntary inspection services to help manufacturers to improve their products.

Shri V. Chandramouly, in the paper 'Need for mandatory standards and certification in well-defined fields to ensure safety and health and to promote exports (S-4/2)', made out a case for making standards mandatory in fields where human health and safety were involved.

Shri K. Subba Rao, author of the paper 'Grading of produce (S-4/3)', dealt with the difficulties of prescribing standards for foodgrains, such as the small area of production, methods of sale, and diversified food habits. He proposed that instead of the procurement standards utilized by the Civil Supplies Department, Agmark standards should be used as far as possible.

Discussion — Shri Satwant Singh (Nasirpur Farm, Patiala) proposed that producers of quality produce should be given incentives, such as assurance of an acceptable price for goods conforming to Indian Standards.

Shri N. C. Ray (Government of West Bengal) also supported this proposal and suggested that there should be no duplication in the efforts of ISI and DMI. He further proposed that the Indian Standards could be implemented through the agency of the Agricultural Departments of the various State Governments.

Col S. K. S. Mudaliar (Survey of India, New Delhi) wanted the standards to be made mandatory to ensure the manufacture of quality foodstuffs and regretted that legislation had so far not proved effective.

Shri K. Sriraman (Department of Marketing, Madras) desired that grading and certification of produce should be done at the producers' level to obtain effective implementation of standards. He further suggested that certified goods should be made available at fairly reasonable prices and that emporia exhibiting and selling only certified goods should be opened all over the country. He also proposed

Dr Y. K. Subrahmanyam addressing the Technical Session 'Implementation of Agricultural and Food Standards'. Others in the picture are Shri G. S. Vilkhu ((left), *Secretary; and Dr A. N. Ghosh*

the grant of on-allowances to producers of standard goods.

Dr Hussain Alizadeh (Institute of Standards and Industrial Research of Iran) gave an account of the standards movement in his country. He said that his country's experience had been that in order to develop exports and earn a good reputation in countries abroad, it was necessary that standards be made mandatory. He gave the example of the export of dates. He also suggested the creation of extension departments in the standards organizations for educating the producers as well as the consumers. Educating the producers, according to him, would facilitate production of quality goods.

Dr B. Sahai (Aarey Milk Colony, Bombay) expressed concern over the adulteration in cattle feeds and said that some means should be adopted to stop this malpractice.

Winding up the discussion on this group of papers, Dr A. N. Ghosh (ISI) drew attention to the difficulties attending upon the scheme of voluntary inspection service and recommended the promotion of organized consumer movements demanding only standard certified goods. He further clarified that there was no duplication of efforts between ISI and DMI. A clear-cut understanding had been arrived at between the two organizations and both were working in their respective well-defined fields. Speaking about the voluntary nature of the Indian Standards, Dr Ghosh pointed out that ISI shared this view with most of the standards institutions of other countries. However, he felt that the standards in the field of human health and safety could be made mandatory. The decision of the purchase organizations to give preference to the ISI certified goods was a proof of the confidence imposed by them in the ISI Certification Marks Scheme.

Sugar Standards

Shri N. C. Varma in his paper 'Scientific means for the reproduction of physical standards for sugar (S-4/6)' dilated upon the work carried out at the National Sugar Institute (NSI) on the objective assessment of the grade of plantation white sugar on the basis of its colour. Various methods were studied to assess the grade of the sugar first in its solution phase and then in its solid phase. In the solid phase, the reflectance values of the sugar crystals gave a reasonably accurate assessment of the whiteness of sugar. The experiments also showed that the reflectance value was the function of two factors, namely, colour and lustre of the crystals. Shri Varma stated that reproducible results were obtained during these experiments and extensive field trials were in progress.

Presenting the paper 'Assessment of quality and grading in sugar industry (S-4/8)', Shri N. C. Varma stressed the need for standardizing the raw materials and other chemicals used in the sugar industry. Emphasis was also laid on the need for laying down chemical requirements for sugar and by-products of the industry.

On behalf of the authors, the paper 'Analytical difficulties in the implementation of standards for sucrose (S-4/7)' was presented by Shri S. N. Mitra. Analysis of sucrose as well as the interpretation of the analytical results presented certain problems which made the implementation of standards for foodstuffs containing sucrose more difficult. The authors discussing the various methods for determining the sucrose content, found chromatography to be most promising. Measures for improvement in the existing practices to ensure proper implementation of standards were also suggested.

Discussion — Dr G. S. Siddappa (Central Food Technological Research Institute, Mysore) stated that in case of fruit products, acidity was a very important characteristic. He was of the opinion that the estimation of invert sugar was sufficient and that there was no need to determine the total sucrose content.

According to Dr N. Narasimhachari (Hindustan Antibiotics), both colour and crystal size were important criteria for assessing the quality of sugar. He, however, suggested that trials be carried out by the method developed at the NSI. The data so obtained should be statistically evaluated. For the determination of sucrose content, he also felt that estimation of only invert sugar was quite adequate.

Replying to the queries, Shri Varma explained that investigations carried out on sugar in solution phase showed that whatever be the size of the crystal, a known quantity of sugar always gave the same amount of colour in solution. However, the same sugars in their solid state, because of the varying crystal size, visually appeared to possess different degrees of whiteness.

Shri M. R. Roy (Fertilizer Corporation of India) stated that sucrose content of Indian sugar was less as compared to that obtained in countries abroad. Efforts should, therefore, be made to evolve economic methods for improving the quality of sugar with respect to sucrose content.

Shri Varma contended that there had been considerable improvement in the quality of the sugar produced in the country over the past ten years. Referring to certain difficulties being experienced on account of the non-availability of the proper quality of sulphur, Shri Varma disclosed that alternative methods for improving the colour of sugar were being explored at NSI.

Agricultural Implements

In the absence of Shri D. N. Kherdekar, the Secretary presented his paper entitled 'Preparation and

implementation of Indian Standards for agricultural implements (S-4/9)' which outlined the importance of standardization for various bullock-drawn improved agricultural implements. As a means for implementing Indian Standards, the paper suggested that the State Agriculture Departments should procure only ISI certified implements. The non-availability of the type of steel specified in Indian Standards also hindered their implementation.

Dr M. P. Sinha, while presenting his paper 'Rational approach to the standardization of the agricultural implements in India (S-4/10)' dealt with the various problems confronting the industry. Dr Sinha stressed the urgency for having standards for fast-wearing parts, and also pointed out the desirability of giving typical designs of implements in Indian Standards in order to assist the industry to establish and organize itself. He further stated that the availability of the right type of raw materials for the construction of the implements was a major handicap in the implementation of these specifications. The author also proposed that investigations be carried out to determine the correct carbon content in the steel required for the manufacture of plough shares. It would be also worthwhile if the heat treatment processes to be given to the steel were also investigated.

Discussion — Speaking about steel, Dr A. N. Ghosh stated that a considerable amount of work had been done by ISI and the industry in rationalizing the different types of steel produced in the country. About 1 500 types were reduced to 156. Recently, by a further reduction the types were limited to 60 only. He was confident that the needs of the agricultural implements industry could be met from any one of these 60 varieties. He further stressed the importance of reducing the number of varieties of the implements at present in use within the country, in order to enhance the productivity. Dr Ghosh also called for efforts to explore the possibilities of using substitute materials in place of high carbon steel for the manufacture of implements.

Shri Satwant Singh (Nasirpur Farm, Patiala) proposed that to promote manufacture of implements of the right type, their prototypes should be made available to the industry.

Fish and Fishery Products

The paper 'Quality control for fish and fishery products (S-4/14)' by Shri M. P. Devasundaram traced the development of the fisheries in the country. Stating that approximately 20 000 tonnes of fish was being exported from the country, the author emphasized the need for adequate facilities for handling and processing of fish on scientific lines.

Shri R. Srinivasan presented the two papers 'A study of the quality of dried white bait in the trade (S-4/15)', and 'Chemical quality of common salt used in the fish curing industry in Madras State (S-4/18)'. The first paper dealt with the problems relating to the quality of dried white bait which was being exported in sizeable quantities from the country. The quality, which was lacking on account of the primitive and crude methods employed for drying the bait, could be improved very much if care was taken to dry the bait on Palmyrah mats.

In his second paper, Shri Srinivasan gave details of the investigation carried out on the quality of salt used in Madras State for the purpose of fish curing. He strongly advocated that only ISI certified salt should be used, which would also improve the quality of the cured fish.

The papers 'Quality of commercial frozen lobsters in relation to standards (S-4/16)', and 'The relationship between product quality and bacterial load in frozen prawn products (S-4/17)' were presented by Shri D. R. Chaudhuri. Both papers stressed the need for very strict hygienic requirements in the production units so as to have products of improved bacteriological quality.

Discussion — Shri P. K. Dewer (Travancore Cochin Prawn Curers' Co-operative Marketing Society Ltd, Cochin) named the non-mechanized trawling, sporadic catches and the crude methods of handling as important practical difficulties in the way of implementation of Indian Standards. He desired that the Government should provide adequate facilities to overcome these difficulties.

Shri N. C. Koli (Marine Products Export Promotion Council), while appreciating the need for strict quality control measures, suggested that the Government should go slow in their enforcement.

The Chairman said that concerted efforts should be made to develop the fisheries industry on scientific lines. The methods of handling, processing and transport should be considerably improved. He also suggested that investigations should be extensively carried out on the use of antibiotics for improving the storage quality of fish.

Fertilizers

Presenting his paper 'Fertilizer standards and implementation (S-4/21)' Shri T. Gopalan Nayar suggested that specifications for fertilizer mixtures and other fertilizer materials should be laid down. He also proposed that the sale of these mixtures should be regulated by enforcing the standards through the agency of the Fertilizer Control Order.

Shri V. R. Mallikarjuneswara in his paper 'A case for trace elements in India's fertilizer programme (S-4/22)' highlighted the importance of trace elements and the vital role they played in plant growth. He proposed that specification for complete fertilizer mixtures should include besides the major nutrients, requirements for trace elements also.

Discussion — Dr J. S. Sundara Raj (Agricultural College and Research Institute, Coimbatore) stated that on account of the extreme variation in the soil, environmental and other factors, it was difficult to make do with only a few fertilizer mixtures for the whole of the country. He also referred to the difficulties likely to be met in standardizing the large number of mixtures needed.

Dr Ved Raman (Sindri Fertilizers) informed that their organization had developed a complex fertilizer which would be soon put into the market.

Col S. K. S. Mudaliar (Survey of India) stated that before any work on laying down standards for fertilizer mixtures was taken up, extensive data on the different types of soils in the country would have to be collected.

INDIVIDUAL PAPERS

Paper S-4/4

In the absence of the author, the Secretary presented the paper 'The press and the promotion of national standards in agriculture and allied fields' which dealt with the utility of audio-visual media for ensuring effective implementation of Indian Standards. The paper also brought out the role that newspapers, periodicals and women's journals could play to educate the producers and consumers on the benefits of standardization.

Paper S-4/5

The paper 'Introduction of bacteriological standards for grading of dairy products' presented by Dr H. Laxminarayana emphasized the need for specifying bacteriological standards for raw milk and other dairy products. Referring to the unhygienic conditions in which milk was handled, the author suggested that incentives and premia should be offered to those producing and offering milk of a better bacteriological quality. Appropriate bacteriological standards and sanitation requirements for different situations were specified and attention drawn to various legislative and regulatory measures that could be made use of for implementing these standards.

Dr A. N. Ghosh (ISI) appreciated the need for having bacteriological standards for milk and milk products but remarked that their implementation was rather difficult. He quoted the example of processed shrimps where bacteriological standards had been specified but could not be implemented on account of the inability expressed by the industry. The Chairman, while agreeing with Dr Ghosh, observed that the problem was of vital significance, and that it would be worthwhile to make trials in some of the well-organized dairies.

Dr N. Narasimhachari (Hindustan Antibiotics) contended that bacteriological standards could be successfully enforced in big organized dairies having the necessary facilities.

Dr N. N. Dastur [National Dairy Research Institute (NDRI), Karnal] mentioned that implementation of bacteriological standards should present no difficulty even in the rural areas. The only thing required would be to educate the rural producers on the important role that sanitation and hygiene could play. Bacteriological standards, he felt, were very necessary for the dairy industry.

Paper S 4/11

The paper 'Standardization in foodgrain industry' presented by Dr S. V. Pingale highlighted the importance of conserving foodgrains. To prevent wastage, he suggested that foodgrain storage structures should be constructed in conformity to Indian Standards. He was supported by Shri N. C. Roy (Government of West Bengal) who proposed that in view of the large quantities of foodgrains expected to be stored by the Government of India, it would be desirable to implement Indian Standards for storage structures.

Paper S-4/12

Dr G. S. Siddappa in his paper 'Necessity for standardization in the field of fruit and vegetable preservation' referred to the standards prescribed under the *Fruit Products Order (FPO), 1955*. The Order had proved to be of immense help to the industry to reach its present state of development. He, therefore, felt that the quality standards prepared by ISI could be easily implemented as they were based on the FPO specifications.

Shri N. C. Roy (Government of West Bengal) suggested that the preservation industry and the horticulture departments should closely keep liaison with each other. Dr D. S. Bhatia (Coca-Cola Export Corporation, New Delhi) corroborated with the views expressed by Shri Roy and proposed that some sort of advisory service should be provided by ISI to help the industry to produce standard products.

Dr P. S. Sarma (EID—Parry and Co, Madras) drew attention to the problem of pesticidal residues in processed fruits and vegetables. He cautioned that some rigorous steps would have to be taken to prevent any mishaps.

The Chairman remarked that the problem of pesticidal residues merited a very serious consideration. He also suggested that the Government should take steps to give all facilities to the cultivators enabling them to produce raw materials of the proper quality.

Paper S-4/13

Dr S. K. Barat presenting his paper 'Some thoughts on standardization of Indian slaughter houses' stated that modernization of slaughter houses was a pre-requisite for the development of the meat and meat products industry in the country. He also emphasized the need for an animal certification service, which would be helpful in implementing Indian Standards.

Dr Subrahmanyam appreciated the views put forward by Dr Barat and remarked that in order to have proper ante-mortem and post-mortem examination of animals, it would be necessary to improve the public health veterinary services. He also disclosed that the *Meat and Meat Products (Regulation and Control) Order* was under the consideration of the Government of India which would take animal certification into account.

Paper S-4/19

Shri S. N. Mitra introducing his paper 'Mandatory standards for spices and condiments—Their enforcement' dealt with the problem of adulteration in ground spices. On account of the lack of proper methods of tests, he said, standards for spices were not easy to enforce.

The Chairman remarked that ground spices easily lent themselves to adulteration; as such, their sale should be regulated. Moreover, analysis of spices called for an extensive research. He also informed the delegates that pilot trials were being made to sell certified ground spices in big cities. If the trials proved successful, certification would then be extended to all over the country.

Shrimati Tara Bai (All India Women's Food Council) expressed satisfaction at these trials and desired that similar certification should be extended to other commodities also.

Paper S-4/20

Shri Amir Singh while introducing his paper 'Testing of seeds of economic plants with reference to purity and viability for fixing minimum seed standards' said that a large number of samples of seeds from various parts of the country were tested with a view to evolving standards acceptable to all concerned. He further proposed that the Indian Standards for seeds could be implemented through the agency of seed laws which were expected to be promulgated soon.

Papers S-4/23-26

In the absence of the authors, the papers 'Effect of accelerated drying and sun drying on the storage behaviour of groundnut pods (S-4/23)' and 'Studies on the cold storage of Indian rice bran and rice bran oil (S-4/24)' were presented by Shri D. Ramachar and Shri S. Ansar Ahmed respectively.

In his paper 'Increased agricultural productivity through standardization (S-4/25)', Shri G. K. Nayar brought out the need for formulation of Indian Standards for the various inputs to enhance productivity.

With the express permission of the Chairman, Dr M. S. Patel presented his paper 'Role of technology in the formulation of tobacco standards (S-4/26)'. He proposed that instead of subjective tests, objective and scientific methods of tests could be specified for tobacco. These would help enhance our exports.

CONCLUSION

Concluding the Session, Dr Y. K. Subrahmanyam stated that the discussions had been fruitful to point out the need for closer co-ordination between ISI and other organizations administering the various statutory regulations. He further stated that Indian Standards should be made mandatory in fields affecting human health and safety.

Dr Subrahmanyam further commented that certain bacteria were pathogenic and their presence in foodstuffs could be harmful. As such, standards involving bacteriological purity for perishable commodities, such as milk, meat, and fish, should be prescribed and enforced strictly.

The Chairman stressed the need for prescribing Indian Standards for agricultural implements and their fast-wearing and inter-changeable components. The question of the availability of the right type of raw materials necessary for their manufacture merited very serious consideration. He also proposed that investigations for using alternative materials for the manufacture of these implements should be carried out. To guide the development of the meat industry on sound and scientific lines, the Chairman felt that the promulgation of the *Meat and Meat Products (Regulation and Control) Order* should be expedited.

Referring to the acute food shortage existing in the country, Dr Subrahmanyam proposed that the Government could consider constructing godowns on the basis of Indian Standards. This would be very helpful in preventing wastage and thus augmenting our food resources.

Proposing a hearty vote of thanks, Dr A. N. Ghosh expressed his gratitude to Dr Subrahmanyam for having consented to preside over the Session at such a short notice and also thanked him for having conducted the proceedings in an effective and interesting manner. Dr Ghosh also thanked the delegates and the authors of the papers for contributing their share to the success of the Session.

S-5 Standardization In the Field of Welding

Chairman	Shri M. Dhar, Chief Engineer, Braithwaite & Co. (India) Ltd, Calcutta
Discussion Leader	Shri S. V. Nadkarni, J. B. Advani-Oerlikon Electrodes Pvt Ltd, Bombay
Secretary	Shri B. S. Krishnamachar, Deputy Director (S & M), Indian Standards Institution

PAPERS PRESENTED

S-5/1	Welding standardization in India	B. S. Krishnamachar, ISI, and R. Ghosh, Indian Oxygen Ltd, Calcutta
S-5/2	Effects of welding procedure on the ultimate cost of steel fabrication	S. V. Nadkarni, J. B. Advani-Oerlikon Electrodes Pvt Ltd, Bombay
S-5/3	Standardization in India in the field of welding	G. L. Hiranandani, Power Cables Pvt Ltd, Bombay
S-5/4	Various considerations for economy through welding	P. K. Mallick, Burn & Co Ltd, Howrah
S-5/5	Distortion during welding and its control	A. N. Subrahmanyan, Heavy Electricals (I) Ltd, Bhopal
S-5/6	Training India's welding personnel	R. Purkayastha, Indian Oxygen Ltd, Calcutta
S-5/7	Training and testing of welders	N. B. Roychowdhury, Burmah-Shell Refineries Ltd, Bombay
S-5/8	Need for rationalization of specification for mild steel for metal arc welding electrode core wire	D. D. Bhat, Modi Arc Electrodes, Modinagar
S-5/9	Standardization of welding materials	V. R. Subramanian, Indian Oxygen Ltd, Calcutta
S-5/10	Development of welding in the fabrication of boilers and pressure vessels	S. N. Sen Gupta, John Thompson (I) Pvt Ltd, Calcutta, and A. Jeavons, The Indian Sugar and General Engineering Corp, Yamunanagar
S-5/11	Design and development of weldments	K. G. K. Rao, Tata Engineering & Locomotive Co Ltd, Jamshedpur
S-5/12	Standardization of welding processes and applications	G. Subrahmanyam, Heavy Electricals (I) Ltd, Bhopal
S-5/13	Criteria for necessity of stress relieving circumferential field welds in penstocks	Y. K. Murthy and K. Madhawan, Central Water and Power Commission, New Delhi
S-5/14	Certain aspects of arc welding in railway freight car design and manufacture	S. Roy, The Indian Standard Wagon Co Ltd, Burnpur
S-5/15	Welding practices—The need for standardization	S. V. Sambamurti, Indian Oxygen Ltd, Calcutta
S-5/16	The rationale of quality control in the welding of wagons and the methods employed	M. Dhar and S. Balasubrahmanyam, Braithwaite and Co (I) Ltd, Calcutta
S-5/17	Some aspects of the quality control of welded structures	N. C. Bagchi and B. C. Biswas, National Test House, Alipore, Calcutta
S-5/18	Quality control of welding in the aero-engine (gas turbine) industry	M. K. Thomas, Hindustan Aeronautics Ltd, Bangalore
S-5/19	Welding of aluminium-tin alloy bearings	K. Nagesha Rao, Hindustan Machine Tools Ltd, Bangalore
S-5/20	Salient features of the problem relating to welding of armour in the construction of armoured fighting vehicles (tanks)	R. C. Menon, Department of Defence Production, New Delhi

S-5/21	A review of Indian Standards on arc welding equipment	N. S. Subbanna, Kirloskar Electric Co Ltd, Bangalore
S-5/22	Standardization of electric welding equipment and accessories	T. Rajaraman, Indian Standards Institution, New Delhi
S-5/23	Inspection of weldments—An appraisal	J. C. Acharya, Indian Oxygen Ltd, Calcutta
S-5/24	A comparative study of the codes on acceptance of weld quality levels for fusion welded drums in the boiler industry	A. Sreenivasulu, Bharat Heavy Electricals Ltd, Tiruchirapalli
S-5/25	Radiography of welded structures	P. K. Sundaram, Hindustan Aeronautics Ltd, Bangalore
S-5/26	Prospects for ultrasonic testing of welds in India	S. G. N. Swamy, Central Mechanical Engineering Research Institute, Durgapur
S-5/27	Some aspects of weldability tests	B. N. Das, National Metallurgical Laboratory, Jamshedpur
S-5/28	Rating of resistance welding machines	S. K. Hari, Malik Electric Works, Bombay

CHAIRMAN'S REMARKS

■ Welcoming the delegates, Shri Dhar of Braithwaite & Co (I) Ltd, Calcutta said that in these challenging times, it was extremely essential that our resources and manufacturing capacity were used with utmost efficiency and economy. Pointing out that India would continue to be short of steel, he emphasized that steel economy was an imperative necessity, and so was standardization which provided for adequate safety with utmost economy. He referred to the findings of the National Council of Applied Economic Research, which had established that welding was an effective tool in achieving considerable economy of steel.

The Chairman said that there were three main problems before the welding industry, namely, availability of trained personnel, raw material and equipment. As far as training was concerned, he suggested that post-graduate courses may be established in engineering institutions with the co-operation of industrial establishments, and training courses of various industrial training institutions may be unified to eliminate the existing variance in the education level of trainees.

The Chairman also laid stress on the efficiency of production. He said that whereas everyone thought of increasing the capacity, it was also necessary that care should be taken to ensure quality of production by realistic, practical and reasonable methods. In this connection he emphasized the need for inspection, non-destructive testing of welds, and the planning and visual control on the quality of production and workmanship. Shri Dhar suggested that national laboratories, research institutes and the manufacturing concerns may work out small portable machines which could be easily handled by semi-skilled workmen. These machines should then be indigenously produced and kept in each fabricating shop to create a general awareness of quality.

Speaking on the present disparity in cost between weldable quality steel plates and non-weldable quality steel structurals, the Chairman said that although steel could be saved by welding, there was little saving in cost largely due to high price of the materials and also higher cost of fabrication. The present price structure, therefore, needed to be reviewed so as to bring it in line with prices in overseas countries. In this regard he advocated standardization of design of structures and said that ISI may issue pamphlets on the economies in overall cost that could be achieved through standardization.

Referring to weldable quality steels, Shri Dhar emphasized the need to develop high tensile steels for welding. He said that designers should be fully aware of the behaviour of such steels under repetitive loading.

Shri Dhar brought out the need for the establishment of a welding research centre as an adjunct to the Indian Institute of Welding, sustained by the industry closely connected with welded fabrication and the Council of Scientific and Industrial Research. The working of this Institute should be closely associated with research as carried out by other established engineering institutions to avoid duplication of work. Further, in order to assess the trend of welding developments in overseas countries, the National Productivity Council should send study teams of experts from time to time.

DISCUSSION OF TECHNICAL PAPERS

Twenty eight technical papers were presented and discussed in the following six groups:

Group 1 Economy Through Welding — Papers S-5/2 and S-5/4;

Group 2 Training — Papers S-5/6 and S-5/7;

Group 3 Standardization — Papers S-5/1, S-5/3, S-5/8 and S-5/9;

Group 4 Processes and Techniques — Papers S-5/5, S-5/10, S-5/11, S-5/12, S-5/13, S-5/14, S-5/15, S-5/19, S-5/20, S-5/24 and S-5/27;

Group 5 Equipment — Papers S-5/21, S-5/22 and S-5/28; and

Group 6 Quality Control and Testing — Papers S-5/16, S-5/17, S-5/18, S-5/23, S-5/25 and S-5/26.

Group 1 Economy Through Welding

Presenting his paper 'Effects of welding procedure on the ultimate cost of steel fabrication' (S-5/2), Shri S. N. Nadkarni, the Discussion Leader, gave the following figures:

Cost of welded fabrication

	Percent
Steel	40
Cutting	13
Assembly	4
Welding	43

Cost of manual welding

Electrodes	35
Labour and overheads	55
Electric power	6
Equipment	4

Shri Nadkarni said that maintaining high arc time or 'operator factor' was an important consideration in the economics or productivity of welding. He also referred to iron powder electrodes and semi-automatic and fully-automatic processes for higher productivity. Pointing out that factors controlling economics of welding should be put into practice by the technical people at all levels, Shri Nadkarni said that fabricators had to

be cost conscious and there was need to analyse cost at every stage of welding.

Introducing the paper 'Various considerations for economy through welding (S-5/4)', Shri P. K. Mallick said that the various factors were: steel, electrodes, equipment, personnel, testing, design and method of fabrication. Each of these factors needed special attention and only then economy could be achieved.

Discussion — Participating in the discussion, Shri M. D. Huisman of Welding Electrodes and Metallic Alloys Ltd, Bombay said that 5 mm electrodes should be used in place of 4 mm for deep penetration technique on butt joints as otherwise necessary penetration will not be reached. The Discussion Leader explained that a 4 mm electrode was adequate as its function was mainly to fuse the faces of the joints and not to provide filler metal in the joint.

Shri S. Balasubrahmanyam of Braithwaite and Co (India) Ltd, Calcutta mentioned that a number of designs prepared by the Government had specified steel conforming to 'IS : 2062-1962 Structural steel (fusion welding quality)'. But on some jobs, they had used steel conforming to 'IS : 226-1962 Structural steel (standard quality) (*third revision*)', without any difficulty. Thus, more steel conforming to IS : 226-1962 could be used for welding. He also said that the weldability test specified in IS : 2062-1962 was stringent and could not be carried out by small fabricators. A simple test was, therefore, required to be evolved. Dr A. N. Ghosh, Joint Director ISI, suggested that Shri Balasubrahmanyam might send his views and experience to the ISI Directorate. The Secretary pointed out that there was already a proposal to revise the weldability test.

Shri Mallick said that basically the weldability test was the responsibility of steel manufacturers as they were charging extra on this account; it may, therefore, be retained in IS : 2062-1962. Regarding training of welders, Shri Mallick said that some of the electrode manufacturers were running their own schools but the training was not adequate. Thus, fabricators also had to run their own schools.

Shri V. R. Subramanian stated that his study of the weldability test had revealed that the latest practice was to give guarantee on weldability mainly based on the chemical composition and notch-ductility of the steel. This point was adequately discussed in his paper (S-5/9).

Group 2 Training

In the absence of the author Shri R. Purkayastha, Shri V. V. Sankaran presented the paper 'Training India's welding personnel' (S-5/6). He said that the training facilities existing in the country were mainly confined to the training of craftsman-welder. It has, therefore, been suggested in the paper that there should be post-graduate course of study in welding engineering, specialized courses for engineers interested in welding, and a brief course for welding supervisors and inspectors. Co-ordination of the training activities with a view to developing a uniform training policy had also been emphasized.

While presenting the paper 'Training and testing of welders' (S-5/7), Shri N. B. Roychowdhury stressed the importance of welding in the petroleum industry and underlined the need for periodic testing of welders to ensure proficiency.

Discussion — Initiating the discussion, Shri Nadkarni said that delegates may discuss re-orientation of the training course to make it more ideal for all those engaged in welding, and long-term scheme versus the short-term scheme now included in Indian Standards.

Dr A. N. Ghosh, Joint Director ISI, said that effective training was no doubt necessary; but, there was need to unify the training procedure also, as multiplicity in design, materials and then in training schemes was not in the overall interest of the country.

Shri Balasubrahmanyam suggested one- or two-year training course in welding for mechanical engineers and metallurgists in the engineering colleges. He said that at the Central Mechanical Engineering Research Institute, there was a welding laboratory which could also be provided with facilities for training welders. The need for unifying the training schedule followed by the Ministry of Labour and the one stipulated in Indian Standards was also brought out. In this connection, Shri Mallick said that the Indian Institute of Welding would probably assist in unifying the training schemes.

Shri S. V. Sambamurti of Indian Oxygen Ltd, Calcutta was not in favour of having a comprehensive training scheme for everyone in all branches of welding. Shri K. C. Srivastava of Indian Sugar and General Engineering Corp narrated the procedure followed in his organization for training and testing, and said that for supervisory positions, they preferred science graduates who were required to pass the examination conducted by the British Institute of Welding. Shri N. S. Chakrapani (Air India) stated that there was need to train welding engineers at the university level.

Shri B. S. Krishnamachar speaking at the Session 'Standardization in the Field of Welding'. To his right is Shri S. V. Nadkarni, Discussion Leader: Shri M. Dhar, the Chairman, and Dr A. N. Ghosh are to his left

Summing up, Dr Ghosh said that from the discussion, it was apparent that there was need to line up the training programmes, and to combine the various courses followed in the country at present. However, a two-year welding course for the mechanical engineer at the university level may not be feasible as this may lead to a higher demand of salary by the person concerned which the industry may not like to pay.

Shri Sankaran said that ISI, Ministry of Labour and the Indian Institute of Welding should get together and evolve a common course to be followed by all institutions in the country.

On a query raised by Shri Roychowdhury, Shri Krishnamachar informed that a code of practice for training and testing of boiler and pipe line welders was being formulated by ISI.

Group 3 Standardization

Introducing the paper 'Welding standardization in India' (S-5/1), Shri B. S. Krishnamachar said that since 1950, ISI had issued a number of Indian Standards, and their implementation had been discussed by various Government departments at length. However, the following recommendations may be considered for further implementation:

a) Existing facilities for training and testing of welders should be enlarged so that competent welders are available in large numbers to the fabricating industry;

b) Steels of weldable quality should be made available in sufficient quantities;

c) Arrangements should be made for the manufacture of electrode quality steel to avoid import; and

d) Capacity for fabrication of welded structures should be increased.

In the absence of the author, Shri Nadkarni introduced the paper 'Standardization in India in the field of welding (S-5/3)'. The author had stressed the importance of implementation of all standards on welding, and had suggested colour codification of electrodes and standardization of the length of electrodes.

Presenting his paper 'Need for rationalization of specification for mild steel for metal arc welding electrode core wire (S-5/8)', Shri D. D. Bhat stated that so far no industrially advanced country had issued a uniform standard on this subject. Even though there was some agreement on the limiting values of sulphur and phosphorus, but there was wide divergence in carbon and silicon requirements. Shri Bhat said that the analysis of a number of indigenous and imported samples has shown the range of silicon between 0·06 to 0·11 percent. Thus, the Indian Standard fixing silicon content at 0·03 percent maximum should be amended. Pointing out that many of the Western countries used more than one specification for the wire depending on the end use, he suggested tentative classification of the wire into three grades: (a) for structural work subjected to dynamic loading; (b) for boiler and structural welding subjected to dynamic loading; and (c) for hard surfacing and low hydrogen electrodes.

Presenting the paper 'Standardization of welding materials (S-5/9)', Shri V. R. Subramanian said that popularization of welding was intimately connected with the availability of not only consumables, training facilities for personnel at different levels, trained operators, and standards and codes of practice, but also on the availability of structural steel suitable for fabrication of welding with relative ease and without excessive cost. Effective and adequate standardization of weldable quality steel was, therefore, of utmost importance. Regarding structural mild steels, stipulation of a maximum limit for carbon content (check analysis) should be adequate for majority of service conditions. For different degrees of severity of loading conditions, restraint, temperature of service, etc, other requirements, such as cleanliness (method of manufacture and killing), grain refinement, condition of material (normalized or not) may be stipulated individually or together depending on the quality of the required steel. As the conditions of service become more exacting, structural steels should not only be restricted in carbon content but also in the manufacturing technique, such as special killing, grain refinement and normalizing. However, the present trend in quality classification (bolted, riveted or welded construction) was on the basis of notch-ductility. The author, therefore, suggested that the guarantee for weldability in 'IS : 2062-1962 Structural steel (fusion welding quality)' may be given on the basis of chemical composition and a minimum impact value at room temperature. There was also a need in the country for structural steels with higher ductility corresponding to Qualities C and D of ISO Recommendations. Similarly, considerable saving in steel was possible by using medium high tensile structural steel, where different qualities could be classified on the basis of minimum impact values stipulated at room or lower temperatures.

Regarding manual arc welding, Shri Subramanian said that through fourth plan period, manual arc welding would continue to be the major welding process. The present requirement of steel for core wire for manual electrodes was 40 000 tonnes per year. Till recently, about 80 to 85 percent of the requirement was being imported but the present requirement was now entirely met from indigenous production at Bhilai Steel Plant.

Realizing the need for a standard covering mild steel for core wire for metal arc welding electrodes, Shri Subramanian continued, 'IS : 2879-1964 Mild steel for metal arc welding electrode core wire' stipulating 'ladle analysis' and permissible variation in 'check analysis' had already been formulated. However, as a result of the experience gained in the past eighteen months at Bhilai in making this steel, 'check analysis' and permissible variation in ladle analysis may be stipulated; furthermore, the frequency of sampling for check analysis may be revised and re-test and rejection clauses introduced to help inspection.

Considering the vital nature of this material for the indigenous engineering industry, Shri Subramanian pleaded for developing a second source and suggested the Mysore Iron & Steel Ltd, Bhadravati as the possible unit. In conclusion, the author emphasized the production of structural steel conforming to 'IS : 2062-1962 Structural steel (fusion welding quality)' in larger tonnage at cheaper prices, review of the price of electrode quality rimming steel, and effective implementation of Indian Standards.

Discussion — Shri H. L. Prabhakar of Bharat Heavy Electricals Ltd, Tiruchirapalli said that information as to which of the electrodes was suitable for a particular steel should be available. The mechanical properties for Indian electrodes may be given in three different conditions, such as, welded, stress relieved and in annealed condition. These properties at elevated temperatures were required for application on boilers.

Shri H. K. Vasantharaj said that welding when resorted to in the textile industry effected cost reduction to an

appreciable extent. However, materials for which standards had been formulated were not readily available.

Shri P. K. Mallick suggested that the ISI Directorate should pursue the Railways to adopt Indian Standards. He wanted simplification of the Indian Standard on coding of electrodes and publication of a comparison of structural steels on the lines of wrought steels.

Shri T. P. Sridharan of Transformers and Electricals, Ernakulam brought out the need for the manufacture of chromium-copper electrodes in the country. Sri M. V. D. Kamath of Welding Electrodes and Metallic Alloys Ltd, Bombay pleaded for standardization of the length of the electrodes in line with the relevant ISO Recommendation. He was not in favour of colour coding of the electrodes. Shri P. Ramanand of Arc Electrodes, Madras said that in colour coding of electrodes, there was possibility of electrodes having the same colour possessing different mechanical properties, and in that case a common colour was not justified.

Shri B. N. Das of National Metallurgical Laboratory said that aluminium in conjunction with sulphur affected weldability. Referring to the Czechoslovakian specification for weldable unalloyed steels, he suggested that ISI may take note of this specification while considering the weldability test.

Shri V. R. Subramanian said that India should have only one grade of mild steel electrode core wire as this was the practice in all the countries. About coding of electrodes, he said that the classification included in the Indian Standard was quite comprehensive and adequate. Furthermore, there was no use having more grades of steels if they could not be manufactured in the country.

Replying to various points raised during discussion, Shri Krishnamachar said that ISI would keep in view the various suggestions while preparing the specification for welding of boilers and pipe lines and while revising colour coding of electrodes. The latter work was being done by a special subcommittee. He informed that Indian Railways had progressively adopted Indian Standards and in case specific cases were brought to the notice of the ISI Directorate, they could be requested to adopt that particular standard. Regarding standardization of the length of electrodes, the technical committee concerned had dropped the subject.

Group 4 Processes and Techniques

Presenting his paper 'Distortion during welding and its control (S-5/5)', Shri A. N. Subrahmanyan narrated the various factors contributing to distortion and the procedure to control them.

Introducing the paper 'Development of welding in the fabrication of boilers and pressure vessels (S-5/10)', Shri S. N. Sen Gupta mentioned various kinds of welding methods used in the fabrication of pressure vessels.

Introducing the paper 'Design and development of weldments' (S-5/11), Shri K. G. K. Rao said that a rational design and development of weldments was the keynote to higher productivity. Moreover, standardization of common design details and introduction of a unit sub-assembly system of construction improved the fabrication quality and achieved economy.

Shri G. Subrahmanyam, author of the paper 'Standardization of welding processes and applications' (S-5/12), illustrated a few welding processes and applications made in the heavy electrical industry and the possible methods of standardization.

Presenting the paper 'Criteria for necessity of stress relieving circumferential field welds in penstocks' (S-5/13), Shri Y. K. Murthy said that stress relieving of welded joints of penstock pipes had created difficulties in several hydro-electric projects. In his paper he had detailed the causes of residual stresses by welding, influence of these stresses, significant factors leading to brittle fracture, and fatigue failures along with the criteria for stress relieving which could be adopted in India.

Shri S. Roy, author of the paper 'Certain aspects of arc welding in railway freight car design and manufacture' (S-5/14), emphasized that weld design should include analysis of its functions, operational requirements, appearance and cost. He pointed out that assembly of components to be welded was as important as welding of joints and described the use of manipulators for welding of welded components. He also suggested the preparation of reference radiographs for fillet welds corresponding to the International Institute of Welding.

Presenting his paper 'Welding practices—The need for standardization' (S-5/15), Shri S. V. Sambamurti said that during the last two decades industry all over the world had taken advantage of rapid advances in the field of welding processes and techniques to manufacture products of better quality at lower cost. There was, therefore, an urgent need for correlation of various practices so that the best practice could be adopted.

The author of the paper 'Welding of aluminium-tin alloy bearings' (S-5/19), Shri K. Nagesha Rao said that aluminium-tin alloy was widely used as a bearing material and in the process of manufacture of slit bearings, welding operation was essential. He briefly described standardization of the procedure for welding of aluminium-tin alloy bearings.

Presenting the paper on welding for tanks (S-5/20), Shri R. C. Menon described salient features and factors involved in the production of sound and reliable welds with armour to form the tank body. He indicated the difficulties involved, how they were overcome and the way quality fabrication could be achieved in practice.

Introducing the paper on 'Fusion welded drums in the boiler industry' (S-5/24), Shri A. Sreenivasulu brought out the need for a unified code for inspection and acceptance of the drums which were subjected to low cycle creep fatigue. The author explained the variations in mechanical properties of the joining plates, design of weldments, weld preparations, etc, along with the extent of non-destructive tests and evaluation of radiographs for quality rating.

Presenting the paper 'Some aspects of weldability tests' (S-5/27), Shri B. N. Das said that his paper dealt with the critical examination of the inherent metallurgical properties and extraneous factors which influenced weldability of steels. He briefly narrated the overseas classifications regarding the weldability tests, and made recommendations about the suitable types of tests for assessing weldability of low alloy steels.

Discussion — Initiating the discussion, Shri S. K. Hari of Malik Electric Works, Bombay, said that consumable and non-consumable inert gas-shielded arc welding, which had many advantages, should also be covered by Indian Standards. With regard to the welding of stainless steels, Shri Hari suggested that non-consumable argon arc welding should be tried. Regarding welding of aluminium, he suggested the use of electric resistance welding or cold welding, and added that higher consumption of electrodes was perhaps due to poor power source.

Shri S. Roy wanted to know whether electro-slag welding could be done without the need of post heat treatment

of the welded joint. Replying, Shri A. N. Subrahmanyan described the procedure followed at the Heavy Electricals Ltd, Bhopal about the radiated elements. He said that at his works it had been proved that black steel could be welded by the atomic hydrogen process and with this process the ductility of the weld metal would not be lower. He requested ISI to take up work on stud welding.

Shri S. Balasubrahmanyam narrated his experience about distortion figures and said that submerged arc welding had two main advantages—the weld was clean and it gave high penetration.

Shri P. K. Mallick said that intermittent welding to avoid distortion would create trouble in case the structure was subjected to dynamic loading. About the use of electro-slag welding, Shri Mallick said that the main drawback was that the cost of equipment was high and the equipment could not be imported. He felt that carbon dioxide-shielded arc welding with consumable electrodes could become popular in India as it was comparatively cheaper. Shri Mallick advocated the cause of ultrasonic testing and said that it was difficult to interpret fillet welding by radiographs which should not be the criteria for wagon welding.

Commending electro-slag welding, Shri Prabhakar said that the literature on the subject which he could send to ISI Directorate may be circulated to the interested delegates. Regarding submerged arc welding, he asked why fused flux was not being adopted instead of agglomerated flux. Explaining, Shri Nadkarni said that fused flux was usually neutral and, therefore, various grades of wire had to be used to get the weld deposits of different mechanical properties. On the other hand agglomerated flux had alloying properties and, therefore, with only one type of wire, weld deposits of varying mechanical properties to suit different applications could be achieved. In India, getting wires of different compositions was an impossible prospect at present.

Shri U. S. Krishnarajan said that induction heating for stress relieving of penstock pipes was not as cumbersome as it appeared. He said that his organization, Indian Hume Pipe Ltd, had stress-relieved 300 joints during a short period.

Shri B. N. Das said that welding of aluminium alloys would present special problems which had to be considered carefully.

Speaking on safety requirements in welding jobs, Shri N. S. Chakrapani of Air India, briefly described various temporary and permanent effects caused by the exposure on eyes and skin.

Shri K. G. K. Rao referring to (S-5/28) said that resistance welding was being used in France for the manufacture of locomotive frames, bridges, wagons, structures subject to dynamic loading, etc. About intermittent welding, Shri A. N. Subrahmanyan said that submerged arc welding gave excellent physical characteristics and in certain applications, submerged arc welding was not in any way comparable to manual welding.

Shri K. C. Srivastava said that electro-slag welding could be X-rayed on a US machine. However, it was not necessary to X-ray every job except boilers.

The Secretary informed the participants that ISI had already prepared, for wide circulation, the draft code of practice for submerged arc welding and a draft covering acceptance tests for wire flux combinations had recently been finalized.

Group 5 Equipment

Presenting the paper 'A review of Indian Standards on arc welding equipment' (S-5/21), Shri N. S. Subbanna mentioned the factors involved in rating the arc welding equipment and reviewed Indian Standards covering these factors. He also discussed the current trend of international standards on the arc welding equipment.

In the absence of the author, the paper 'Standardization of electric welding equipment and accessories' (S-5/22) was introduced by the Discussion Leader. The paper included a comparative study of various national and international standards covering arc welding equipment, resistance welding equipment, rectifier welding equipment, and their accessories.

Presenting the paper 'Rating of resistance welding machines' (S-5/28), Shri S. K. Hari said that the rating of a resistance welding machine was at present standardized on the basis of its thermal kVA, which was the product of secondary open circuit voltage and current on 50 percent duty cycle basis in an integrating period of one minute. This did not in any way reflect its capability of being able to weld a particular job. He was, therefore, in favour of rating based on the current and pressure which the machine could deliver. He also pleaded for rethinking on the standardization and rating of resistance welding equipment at the international level which should be more rigid, simple and easily understandable by both buyer and user.

Discussion — Initiating the discussion, Shri Balasubrahmanyam pointed out that the concerned technical committee of ISI had finally decided that the present way of rating would be on the basis of maximum output current which the machine could deliver under specified conditions. As far as kVA rating was concerned, the only method was to go by the ISO proposal.

Shri Srivastava said that the indigenous welding transformers did not give good service in the long run as something was wrong. This should be investigated. Replying, Shri G. T. Nihalani of J. B. Advani-Oerlikon Electrodes Pvt Ltd, Bombay, said that while rating the resistance welding machine based on the actual secondary current, the incidence of the voltage should be taken into account. A machine with low voltage and smaller kVA could give as much current as the machine with higher kVA and different voltage. The specifications on the subject should, therefore, not be rigid. Moreover, if the machine was properly maintained, no difficulties would arise.

Referring to the paper (S-5/21), Shri Hari said that the question of the machine delivering current in excess of rated capacity was a matter to be agreed to between the manufacturer and the buyer. He informed that facilities for testing arc welding on duty cycle basis were already available. Regarding substitution of aluminium in arc welding cables, he said that the flexibility aspect which was of paramount importance should be considered.

Shri Subbanna said that he had suggested increase in the rating of the machine to cover excess current, as was the practice followed in UK and other countries. For maximum utility of the machine, it was necessary that the machine should deliver higher current than the normal rating.

Shri Hari was, however, of the view that a reference in this regard should be included in Indian Standards on arc welding equipment.

Group 6 Quality Control and Testing

Introducing the paper on quality control in welding of wagons (S-5/16), Shri S. Balasubrahmanyam said that his paper dealt with the logical and

practical basis of the quality requirements, the control of variables, specification of procedures, use of qualified welders and continuous visual inspection by supervisors and shop floor inspectors.

Presenting the paper on aero-engine industry (S-5/18), Shri M. K. Thomas said that his paper dealt with the procedures employed for certification of welders and the inspection of weldments in the aero-engine industry.

In the absence of Shri J. C. Acharya, his paper 'Inspection of weldments' (S-5/23) was presented by Shri Subbiah. He said that considering the increased use of base material and electrodes of one country by another, it was necessary that steps should be taken to evolve a unified testing inspection policy for all nations.

Presenting the paper 'Prospects for ultrasonic testing of welds in India' (S-5/26), Shri S. G. N. Swamy said that for the introduction of ultrasonic testing of welds in India he had discussed in his paper the possibilities of co-operation between the Central Mechanical Engineering Research Institute, inspection authorities, ISI and the industry.

In the absence of the authors, papers (S-5/17) and (S-5/25) were taken as read.

Discussion — Shri Srivastava informed that he was preparing radiographs of pressure vessels and boilers and some of them could even be adopted as acceptance standards.

Shri Roy pointed out that ISI in its work of preparing reference blocks should take note of similar work recently done by the International Institute of Welding.

Shri A. N. Subrahmanyan stated that at Heavy Electricals, Bhopal, all critical welds were ultrasonically tested to accept only flaw-free welds, and radiographic examination was carried out for defective welds. He wanted ISI to lay down acceptance standards in these fields.

Shri V. R. Subramanian said that radiographic testing had to remain in vogue for some more time, as ultrasonic methods had yet to win the confidence. He was not in favour of reducing the frequency of impact test. For non-destructive testing, he brought out the need for mobile testing units and the formation of a Society.

Shri C. M. Bhatnagar from Railways wanted 100 percent ultrasonic testing to be substituted by X-ray. Mentioning that 25 percent failures resulted as soon as operator was changed, he said that the examination of fillet welds by ultrasonic testing was difficult and a weld could not be certified on 100 percent ultrasonic testing. He pleaded for Indian Standards on ultrasonic testing and the test equipment.

Shri K. G. K. Rao mentioned that some work had been done on the subject in UK.

Shri S. G. N. Swamy said that Central Mechanical Engineering Research Institute, Durgapur, would soon be publishing the correlation results of ultrasonic testing. Furthermore, CMERI was thinking of setting up a Society for non-destructive testing, starting a programme of training ultrasonic welders and engineers for such testing, and establishing centres for non-destructive testing by commissioning a few mobile units. Regarding fillet welds, he said that rigourous qualification tests and visual examination were necessary and informed that UK was switching over to ultrasonic testing.

Shri Krishnamachar informed the delegates that ISI had set up a separate technical committee to deal with non-destructive testing of metals. Referring to the preparation of reference radiographs, he said that this project had already been taken up and the work was now in progress at the CMERI. ISI had also published a code giving general recommendations for radiographic examination of fusion welded joints. Work on the publication of a safety code was in an advanced stage of preparation. He assured that ISI would consider initiating work on a code for training and testing of welders for ultrasonic testing.

REMARKS OF THE DISCUSSION LEADER

Shri Nadkarni requested delegates to send to ISI, for circulation to participants, data regarding cost build-up, arc time, incentive schemes and comparison of different welding procedures.

Summing up the discussions, he said that some of the discernible trends were: need to assess the different training and testing schedules followed by various organizations and to unify them; evolving short but effective training schedules; certification of welders for a particular type of joint and position; setting up another unit for supply of electrode quality steel; exploring the possibilities for relaxing silicon content in the Indian Standard specification for mild steel electrode core wire; need for inviting views from steel manufacturers on the weldability test; and laying down specifications for the length of electrodes in millimetres and the colour coding scheme for electrodes. Regarding rating of welding equipment, he said that this may be left to the discretion of manufacturers and purchasers. He suggested that paper (S-5/28) may be referred to the relevant technical committee of ISI, and as suggested by the delegates, ISI may formulate a standard on submerged arc welding; collect more data on distortion, shrinkage, etc, for the guidance of fabricators; take up work on the specification for electro-slag welding; and look into the use of agglomerated flux as an alloying element. The discussion had shown that power source was an important matter and due emphasis should be laid on it while preparing specifications for welding equipment. Referring to the discussion on stress relieving of penstocks, Shri Nadkarni felt that the matter may be discussed by the relevant subcommittee with a view to bringing out a publication on low temperature stress relieving and normal stress relieving.

CHAIRMAN'S CONCLUDING REMARKS

While concluding the Session, the Chairman observed that incentive schemes for productivity had their own advantages. Shri Dhar also suggested that in view of the importance of the subject, a two or three day session may be held either at Bombay, Madras or Calcutta for discussing the various papers in details. He commended Shri Nadkarni, Shri Krishnamachar and Dr Ghosh for the useful roles they had played in the Session.

On behalf of the ISI Directorate, Dr Ghosh thanked the Chairman for conducting the proceedings of the Session in an efficient manner. He also thanked the authors for their valuable contributions and the participants for the lively discussion.

S-6 Crisis of Shortage of Building Materials

Chairman	Prof M. S. Thacker, Member, Planning Commission, New Delhi
Discussion Leader	Major-General Harkirat Singh, Adviser (Construction), Planning Commission, New Delhi
Secretary	Dr H. C. Visvesvaraya, Deputy Director (Civil Engineering), Indian Standards Institution
Dates	14 and 15 December 1965

PAPERS PRESENTED

S-6/1	Shortage of building materials—Reactions and responsibilities of Indian Railways	D. N. Chopra and G. H. Keswani. Railway Board, Ministry of Railways, New Delhi
S-6/2	Conservation of materials through planning, design and use of new techniques	N. G. Dewan, Central Public Works Department, New Delhi
S-6/3	River valley projects and the crisis of shortage of construction materials	C. L. Handa, Central Water & Power Commission, New Delhi
S-6/4	Shortage of building materials—Some reasons and remedies	N. T. Patel, N. T. Patel & Company, Madras
S-6/5	Some thoughts on crisis of shortage of building materials	K. K. Nambiar and B. T. Unwalla, The Concrete Association of India, Bombay
S-6/6	Research and development in building materials	Prof Dinesh Mohan and Dr Mohan Rai, Central Building Research Institute, Roorkee
S-6/7	Conservation of building materials by standardization of precast building units	K. Veeraraghavachari, Bharat Heavy Electricals Ltd, Tiruverumbur
S-6/8	Some measures for conserving cement and steel	Prof G. S. Ramaswamy and Zacharia George, Structural Engineering Research Centre, Roorkee
S-6/9	Conservation of cement through standardization	Y. C. Gokhale, Regional Research Laboratory, Jorhat
S-6/10	India faces threat of a timber famine	C. Seshachalam, Curzon & Company, Madras
S-6/11	Conservation of structural timber through standardization	N. J. Masani and A. N. Bajaj, Forest Research Institute, Dehra Dun
S-6/12	Frameless doors and windows	S. Mallikarjunaiah, Mysore Iron and Steel Limited, Bhadravati
S-6/13	Mobile timber treatment plants for rational utilization of timber	P. Mitra, William Jacks and Company Ltd, Calcutta
S-6/14	Soil as a building material	Kewal Krishen, Directorate of Technical Education, and Dr I. S. Uppal, Building and Road Research Laboratory, Chandigarh
S-6/15	Utilization of available local soil in ordinary foundations	S. P. Arora, Public Works Department, Uttar Pradesh
S-6/16	Soil-cement as a construction material	S. Krishna Iyer, Engineer and Contractor, Madras
S-6/17	Uses of industrial wastes in building industry	B. C. Banerjee, Directorate General of Technical Development, New Delhi
S-6/18	Role of blastfurnace slag in relieving the shortage of building materials	P. J. Taraporewala and R. L. Kumar, Bhilai Steel Plant, Bhilai
S-6/19	Utilization of blastfurnace slag as a construction material	Dr M. L. Puri and Dr Bh. Subbaraju, Central Road Research Institute, New Delhi

OPENING REMARKS

■ Opening the Session, Prof M. S. Thacker said that the shortage of building materials was a very timely subject for discussion. The country was facing acute shortage of building materials and the demands in the forseeable future were indeed very high. He remarked that the term 'crisis' was used more for the purpose of drawing attention to this important issue than to indicate that something very serious had suddenly happened. He expressed the hope that the Session would examine the extent of the crisis and suggest practical solutions to get over this situation.

Referring to the Fourth Five-Year Plan, Prof Thacker said that expenditure on construction for various purposes was likely to be of the order of Rs 100 000 million, representing nearly 50 percent of the total outlay in the Fourth Plan. Of this, nearly 60 to 70 percent would account for building materials and components alone. Though, in view of the present situation the tempo of construction in the first year of the Fourth Five-Year Plan might be relatively slower, it was bound to accelerate in the subsequent years.

Prof Thacker said that the present crisis or shortage should be examined with a view to stimulating action which would make basic materials, like cement, steel and timber, available in the required quantities. He wanted proper attention to be paid to the solutions presented by our expert knowledge and rich experience and deprecated the tendency to hamper progress by raising objections because of an orthodox attitude on technical issues or due to certain administrative procedures.

Referring to the technical papers, the Chairman felt heartened by the very good response as it indicated the determination of our engineers to solve this important problem. He assured that the recommendations emanating from the discussions at this Session would be given the most careful consideration by all the organizations interested in this subject, such as the Indian Standards Institution, the Planning Commission and the National Buildings Organisation.

PAPERS FOR DISCUSSION

The Secretary, Dr H. C. Visvesvaraya, explained that the object of the Session was to determine whether

S-6/20	Potential uses of granulated blast-furnance slag in conjunction with imel	D. C. Mittra, Bisra Stone Lime Co Ltd, Birmitrapur
S-6/21	Neyveli fly ash as a partial replacement for cement	K. Narasimulu, K. J. Taraporewalla and Saad Hussain, Engineering Research Department, Hyderabad
S-6/22	Economy in cement by the use of Delhi and Harduaganj fly ashes	B. N. Gupta and C. M. Pant, Irrigation Research Institute, Roorkee
S-6/23	Building lime from press mud	Dr H. L. Uppal and Gursharan Singh, Land Reclamation and Power Research Institute, Amritsar
S-6/24	Kankar-lime	Dr H. L. Uppal and Mohinder Singh, Land Reclamation, Irrigation and Power Research Institute, Amritsar
S-6/25	Improved kilns for lime manufacture	Y. P. Rao, Lime Manufacturing Industry, Khadi and Village Industries Commission
S-6/26	Exploitation of clay pozzolana as a construction material	R. K. Ghosh and N. R. Srinivasan, Central Road Research Institute, New Delhi
S-6/27	Overcoming shortage of conventional plumbing materials	C. R. Rama Rao, Indian Standards Institution, New Delhi
S-6/28	Waste reduction of building materials	S. R. Nair and P. S. Krishnaswamy, Military Engineer Services
S-6/29	The role of operational research techniques in conserving building materials	Lt-Col H. S. Subba Rao and S. Subba Rao, Research and Development Organization, Ministry of Defence, New Delhi
S-6/30	Techniques for meeting the crisis of shortage of building materials	H. C. Ramanna, Management and Industrial Consultants (P) Limited, Bangalore
S-6/31	Aluminium in buildings	R. M. Chaudhri, Indian Aluminium Company Ltd, Calcutta
S-6/32	Conservation of materials through planning and design	P. P. Dharwadekar and G. D. Singh, National Mineral Development Corporation Ltd, Faridabad
S-6/33	Utilization of industrial, agricultural and forest waste	N. C. Jain and Dr R. C. Gupta, Forest Research Institute, Dehra Dun
S-6/34	Grading as an aid in timber economy	A. C. Sekhar, Forest Research Institute, Dehra Dun

The Session 'Crisis of Shortage of Building Materials' is being addressed by Prof M. S. Thacker. Seated from left to right are Dr H. C. Visvesvaraya, Secretary; Major-General Harkirat Singh, Discussion Leader; and Dr Lal C. Verman

there was a crisis in regard to building materials and if so what was the extent of the crisis and what remedial measures could be taken for overcoming it with particular reference to what standardization could do. He emphasized consideration of the standardization activity not only at the national and international levels but also at departmental, project and inter-project levels as those levels were also equally important.

For facilitating discussion, the papers presented to the Session were divided into the following groups and subgroups:

Group I General

1) Assessment, planning and design (S-6/1 to 5, 7, 8 and 32)
2) Management (S-6/28 to 30)

Group II Specific

3) Cementing materials, such as cement, lime, pozzolanas and use of industrial wastes (S-6/6, 9 and 17 to 26)
4) Soil (S-6/14 to 16)
5) Timber (S-6/10 to 13, 33 and 34)
6) New building materials and miscellaneous items (S-6/27 and 31)

Certain subjects had been briefly touched upon in some of the papers but were not specially covered in any paper as such. The following five additional groups were, therefore, to be considered for discussing these subjects:

7) Steel
8) Bricks and tiles
9) Quarried materials
10) Roofing materials
11) Other new materials, such as plastics, resins including epoxy resins and fibreglass.

PREVIEW

Major-General Harkirat Singh, the Discussion Leader, briefly reviewed the construction activity as a whole and laid emphasis on finding measures not only to overcome the existing shortage but also to avoid such situations in future. He observed that papers in the first group had made an attempt to assess the future requirements of the country and had shown how in the past availability had fallen short of the assessed requirements. Drawing attention to the developmental programme ahead, the General said that even though the country may, in times to come, be able to produce all its requirements, it would not be able to catch up unless there was a strict control over wasteful expenditure.

A general view of the audience intently listening at the Session 'Crisis of Shortage of Building Materials'

One had, therefore, to think of forward planning on the basis of properly assessed demands and to make efforts to economize in cost as well as materials per unit of construction. He also cautioned against the tendency to construct temporary buildings in order to save materials and cost of construction for the present. If these buildings had to be replaced subsequently, it would only mean postponement of the crisis for the next generation. Under the heading 'design', a number of useful suggestions had been made in the papers to reduce waste in foundations by carrying out detailed investigations and making use of space structures, such as shell roofs and folded plates. Similarly, the advantages of using prestressed concrete, lightweight materials for multi-storeyed structures, and ceramic hollow blocks were highlighted. He said that the need for greater speed of construction combined with saving of materials may force the country to go in for prefabrication and industrialized methods of production of buildings. Increased use of standard components and units was bound to come in these developments.

General Harkirat Singh underlined the role of management techniques like inventory control and value analysis to avoid waste in production, transport and handling. Other methods like specifying concrete mix by strength as recommended in 'IS : 456-1964 Code of practice for plain and reinforced concrete (*second revision*)' would lead to a saving of cement. Grading of cements according to strength would also assist in the rational utilization of available material. Similarly, the production of ready-mixed concrete around large cities with sizeable consumption could alone save cement to the extent of 10 to 15 percent. Though cement production was likely to be doubled in the next five years, the construction activity too in the same period was going to be more than doubled. Every effort should, therefore, be made to conserve cement, and encourage the use of alternate materials like lime, fly ash, pozzolana and so on. There were certain prejudices against the use of some of these materials. It was for the engineers to create demand for standard lime and he was sure the manufacturer would produce them. Regarding fly ash, it had been proved that it could be satisfactorily used to the extent of over 20 percent. The fear of corrosion of steel when fly ash was used had also been shown to be without foundation. Other industrial wastes like slag could also be used as aggregates in areas close to where they were available.

Continuing, Major-General Harkirat Singh underlined the importance of soil as a basic construction material which had been stressed by a number of authors. He wanted attention to be paid to the use of soil-cement bricks, and soil-bitumen bricks and advocated the use of modular bricks and mechanized methods of production to cut down wastage and produce bricks of a uniform quality. Attention was drawn to the study made by the National Council of Applied Economic Research on the likely saving in steel by the application of new rationalized

standard steel sections, welding, use of tubular structures, etc, as recommended in the various Indian Standards. Genral Singh favoured the use of deformed bars and twisted bars for reinforcement in place of round bars which would reduce the quantity consumed. Similarly, he laid emphasis on greater use of prestressed concrete, as well as use of prestressed pipes, asbestos pipes, PVC pipes and polythene pipes in replacement of cast iron pipes.

Regarding timber, the General referred to the need for increasing use of secondary species, properly treated and seasoned. If only standard doors and windows were specified and they were produced in the factory, there would be colossal saving in timber as well as in cost. Again, life of timber could be considerably increased by proper treatment and use of preservatives. General Harkirat Singh also laid stress on the need to avoid wastage by making greater use of particle boards, hardboards, etc.

Better use of tiles and shingles as roofing materials, utilization of indigenous asbestos fibres for making asbestos cement sheets, better utilization of quarried materials like sand and stone, increasing use of slag aggregates obtained from steel plants, and promotion of the use of new materials like aluminium and plastics were some of the other topics which came up for pointed mention.

In conclusion, the Discussion Leader appealed to the older engineers to overcome their conservatism and prejudices and to take to new ideas and new materials. He exhorted the delegates to give practical suggestions and welcomed proposals coming from organizations like the Central Building Research Institute and Structural Engineering Research Centre. He stated that in the light of practical suggestions, various standards could be reviewed and Planning Commission could take necessary steps to make the private sector and other organizations respond to them.

DISCUSSIONS AND RECOMMENDATIONS

Assessment, Planning and Design

During the discussions, emphasis was laid on the need for a revolutionary approach in respect of planning, design and use of materials for major civil engineering projects; development of new substitutes; augmenting production of basic building materials like cement; greater adoption of new techniques, such as shell and folded plates, ready-mixed concrete, prestressed concrete, use of high tensile deformed bars and load factor method of design; standardization of precast units for medium industries and wider adoption of Indian Standards for design, such as 'IS : 456-1964 Code of practice for plain and reinforced concrete (*second revision*)'. Recourse to semi-permanent type of structures in certain fields of activity, such as mining projects—to last for about 15 years—was pointed out as a possible answer to bring down the cost of construction.

Mention was made of the manner in which new materials and new techniques were being developed and applied in Europe, USA and Japan. In India, the introduction of new materials and techniques into the construction industry posed difficulties as the scales were heavily weighted against innovations. Government policy in UK helped the industry to improve its efficiency and output. Actions taken towards this end included forward planning of the construction programme a number of years ahead; collation of demand in the public sector into larger and more continuous programmes; the introduction of industrialized methods of buildings; creation of development groups of client, designers and the industry to study user requirements and develop new techniques; introduction of dimensional co-ordination and the promotion of standardization in design; encouragement of innovation; improvement of management procedures; expansion of research effort and effective dissemination of technical information. The policy also envisaged the selection of the contractor at an early stage in the design of a project to be associated as a member of the team while details were developed and bills of quantities drawn up.

A break-through in conserving available building materials could be achieved by use of higher-strength concrete, by allowing permissible stresses in steel to yield limit, by reducing steel relaxation losses which amounted to 8 to 10 percent in prestressed concrete, and by use of computers in complicated analysis of materials saving forms and designs. Use of high tensile deformed bars and load factor methods of design would add to the savings in steel indicated in the NCAER study. It was also stated that vertical planning as envisaged by Le Corbusier and close living would reduce the consumption of materials for services, such as roads, water supply and sanitary systems. Reference was made to the practice, followed in countries like USSR, to relax certain standards specially in matters relating to factors of safety in the field of river valley projects based on the size and benefits which accrue.

The delegates emphasized the need for formulating a comprehensive all-India schedule of rates which could be used by major Government departments, such as MES, CPWD, Railways and State PWDs, for unifying their own output standards and schedule of rates evolved years ago. It was disclosed that the Planning and Organization at Site Sectional Committee (BDC 29) of ISI was already seized of this problem and that all organizations should send their schedules of rates, specifications and other related forms regarding contracts, etc, to ISI so that they could be taken into account during the development of the unified national recommendation on the subject.

Proper appreciation of the true economics of temporary and permanent buildings, permitting use of mortars upto 1 : 8 proportion and specifying thickness of wall taking into consideration the brick and mortar in relevant Indian Standards for brickwork, allowing buildings with bricks upto four storeys, adoption of semi-mechanized production of bricks and production of perforated bricks were suggested as other design measures for conserving building materials. Stress was also laid on the need for doing away with scarce materials and adopting other alternative materials, as for example replacing the timber railway sleepers by reinforced cement or prestressed concrete sleepers (which needed only about one percent of the estimated production of cement), and increased use of locally available materials. More economical forms of structures, such as space structures, should be given due consideration at the planning stage itself. While noting that ISI had already prepared a basic code on shell roofs and folded plate structures, it was observed that recommendations relating to space structures would go a long way in popularizing these techniques. Industrialized methods of building construction have to be slowly introduced for which it would be necessary to develop and use standard building components and units, so dimensioned that they fall within the system of modular co-ordination.

Major-General Harkirat Singh initiates the discussion

Recommendations on modular co-ordination which have been already brought out in the Indian Standards should be expeditiously adopted by all architects and engineers in the country. Use of high-strength concrete for all structural purposes should be resorted to as far as possible as this would also result in conservation of materials. There is need for a materials engineer in every design office to assess the availability and suitability of locally available materials for the project and to co-ordinate the work with the design engineer.

The need for standardization in the field of town planning was brought out and it was suggested that ISI should take up this subject. The importance of standardization at various levels in the matters of organization, utilization and dissemination of the accumulated knowledge was stressed and the excellent work already being done by the Construction Division of the Planning Commission and the National Buildings Organisation was appreciated.

Management

The delegates underlined the scope for waste reduction and the role of operational research and other management techniques like mathematical programming, critical path method (CPM) and programme evaluation and review techniques (PERT). The time factor and the limitations connected with the production and use of substitutes were brought out and stress was laid on the need for training tradesmen and skilled workers in the field of building industry.

Cementing Materials

The major points highlighted during the discussion were:

a) Grading of Portland cement into at least two grades was recommended in the interest of rational utilization. This was being done in other big countries like Russia and USA.

b) Greater use of materials like blastfurnace slag and other pozzolanas should be permitted in the manufacture of Portland pozzolana cement. It was noted that standards formulated by ISI permitted addition of pozzolana at factory as well as at site if proper blending could be assured. ISI was also requested to expedite the work on specification for fly ash.

c) Various materials, such as lightweight aggregates, slag aggregates, blastfurnace slag cement, building lime from press mud, etc, should be popularized. Slag aggregate should be considered for use in railway track as ballast and for construction of roads at least in areas like Durgapur where stone aggregate is scarce and costly. Screening and grading plants should be established near the steel plants.

d) The adoption of Trief process for mass concrete construction should be encouraged to relieve the pressure on cement.

e) The emergency specification on masonry cement being formulated by ISI should be expedited and should be increasingly implemented by all concerned.

f) The question of rel xing lime content from 35 percent to 45 percent in 'IS : 455-1962 Specification for portland blastfurnace slag cement *(revised)*' should be considered. In this context, it was pointed out that already the said specification was revised to accommodate Indian slags in respect of MgO, MnO and hydraulic index. While trying to accommodate slags from other sources it should be ensured that the final performance of the cement was not adversely affected.

g) Pozzolana cements should be made cheaper than ordinary Portland cement to popularize their use.

h) Lime pozzolana mixtures, such as the lime reactive *surkhi* mixture—used extensively in France, USA and Germany—can play an important role as they are cheaper for the same strength. As the cement industry could not be stretched indefinitely in view of the limited resources of limestone, one or two plants should be set up for the production of lime reactive *surkhi* mixture.

j) Lime industry should be developed as an organized medium scale industry. More demand should be created for standard lime to offer incentive to manufacturers to improve their kilns and produce good quality building lime conforming to relevant Indian Standard specification.

k) Natural resources like *kankar* lime and certain pozzolanic clay deposits should be exploited fully.

m) Rotary kilns, tube mills, machinery for grinding, etc, could be manufactured within the country without involving any foreign exchange.

Soils

Emphasis was laid on the increasing use of locally available soils in the form of soil-cement or soil-bitumen mixtures and soil-cement blocks as they withstood weathering and other performance requirements satisfactorily. Sizeable constructions using different percentages of cement had already been successfully adopted in some parts of the country and even in countries like USA. Soil-cement could also be used for canal lining, foundations of walls and in grouting operations for large dams. It was felt that the Geological Survey of India could provide guidance regarding the availability of soils suitable for various uses.

Timber

Attention was focused on the imminent threat of a timber famine due to *panchayat* control, deforestation, multipurpose river valley projects, irrational grading and utilization and prejudices for using secondary species of timber. Utilization of agricultural and industrial wastes for making substitutes, such as particle boards and chip boards, was recommended and the development of the concerned industries on priority basis emphasized. All out efforts were required to conserve timber resources to save them from dwindling down in a couple of generations. Greater use should be made of secondary species of timber treated with preservatives as recommended in the various Indian Standards, small dimensioned stocks by means of modern jointing techniques, and defective timber after properly evaluating its characteristics. For prolonging the life of timber, anti-termite measures during construction should be resorted to. CPWD, MES and Public Works Departmets should specify the use of only treated secondary species of timber in their tender documents; primary species should be prescribed only where they were very essential. The delegates advocated the use of standardized frameless doors and windows for low cost housing. It was noted that major users of timber like the Railways were already switching over to RCC, PCC and steel for sleepers. It was also emphasized that priority should be given for developing industries for particle boards and other wood-based industries using industrial and agricultural wastes.

New Building Materials

Delegates noted that to overcome the shortage of conventional plumbing materials, ISI had formulated specifications for polythene pipes and was permitting the use of aluminium and aluminium alloys, plastics, etc, for the manufacture of water meters and their components. Recourse to pipes made of prestressed concrete and ERW steel was suggested in place of conventional cast iron pipes.

The salient characteristics of aluminium and its useful applications in the curtain walling system for exterior non-load bearing walls to resist wind and weather as well as in the prefabricated frameless construction for warehouses and labour colonies were pointed out. Aluminium was very well suited in certain cases because of its light weight, load bearing qualities, higher scrap value, etc. The prohibitive cost of aluminium was, however, restricting its use.

Steel

The discussions brought out that the study by NCAER in saving structural steel has been made on the assumption that all the sections would be available and these savings could be effected only when Indian Standards sections became freely available. The difficulty of rounding corners could be overcome by rounding off the mould itself. The increased production and use of high tensile steel wire would help conserve steel. Attention was drawn to the economy that could be achieved by welding of steel reinforcement in concrete. ISI was already preparing a standard on welding of steel reinforcement; it was also felt that certain field tests for testing of welds should be evolved and standardized. Using high tensile deformed bars, supplying reinforcement bars in definite lengths, adopting minimum tolerances, and reducing wastage of steel at job sites, which amounted to nearly 10 percent were mentioned as other remedial measures for conserving steel.

Bricks and Tiles

Problems faced by the brick industry, such as the non-availability of good soil and shortage of suitable labour in different regions of the country were discussed. It was noted that for mechanization of brick industry lack of foreign exchange was the main hurdle. Manufacturers as well as users were asked to expedite the process of change-over to the use of modular bricks. As regards roofing tiles, it was noted that the position was not bad. Investigations for reducing warping and cracking of tiles and for making tiles from inferior soils in places like Andhra Pradesh were being carried out. It was felt that the use of tiles for roofing purposes should be encouraged in place of asbestos cement sheets which required the import of asbestos fibre.

Greater use of ceramic facing bricks and ceramic tiles was recommended to eliminate plastering and finishing work, thus conserving cement.

Quarried Materials

It was emphasized that particular attention should be paid to modern quarrying and blasting methods to bring down the overall cost of quarried materials, such as stone aggregates and sand, which form a major part of any construction.

Roofing Materials

It was noted that roofing tile held its place in most of the construction. Asbestos cement sheet, it was pointed out, could not be avoided in many situations and early steps to obtain sheets with entirely indigenous asbestos fibres should be taken. Because of their small insulation value, galvanized iron or aluminium sheets could be used only for moderate climates. To overcome the non-availability of zinc for galvanizing, experiments on plastic coating of sheets were being carried out. If plastic coating became successful, it should be implemented by all because of the added advantage of insulation. Use of corrugated asphaltic sheets was not considered feasible for places where the temperature was very high. Use of shell or folded plates and other stressed skin concrete constructions was considered ideal for spanning large areas.

It was felt that experiments should be conducted on the use of plastic sheets and ceramics for roofing purposes. For semi-permanent structures and factories, plastic sheets or other artificial fibre sheets intersticed with asbestos sheets were recommended. For temporary structures, space grids which envelop space and utilize the minimum amount of materials were considered ideal solutions.

Other New Materials

It was felt that greater attention should be given to the use of such materials as plastics, resins, fibre glass, glass wool, etc, for building purposes as they had potentialities for serving as alternatives to some of the conventional building materials.

CONCLUSION

Summing up the discussions, Major-General Harkirat Singh (who was in the chair from the afternoon of 14 December due to the unavoidable absence of Prof M. S. Thacker) said that the very fact that the Session originally scheduled for one day had to be extended to the next, showed the enthusiasm and interest of the participants. He said that the quantum of construction in the coming years would be very heavy, as apart from the industrial and other developmental activities,

the urban population of the country was expected to go up from 80 million to about 200 million by 1981 thus matching the total urban population of USA. The construction engineers were thus faced with a challenge, the like of which had never been faced by any other country.

In order to meet this challenge, Major-General Harkirat Singh called for revolutionary thinking on the part of all connected with constructional activity in the country. Things must alter and proper attention paid to non-traditional methods and materials. Increased mechanization of production of building materials as well as construction processes was also essential. The General pointed out that to achieve the required degree of mechanization, a good deal of required mechanical plants could become available from internal resources without involving any foreign exchange or foreign know-how.

The General urged upon engineers and technologists connected with construction activity to create a climate in which new ideas and new innovations could flourish. This alone would provide the inner strength. The profession as a whole should own responsibility and initiate action on the various suggestions and recommendations emanating from the deliberations. Before concluding, General Singh invited everyone to send suggestions for quick implementation of the proposals which could be followed up by ISI or the Planning Commission which would disseminate the knowledge and initiate action at appropriate levels.

Proposing a vote of thanks to Prof M. S. Thacker and Major-General Harkirat Singh, the Secretary, Dr H. C. Visvesvaraya said that the deliberations had produced useful results and the various recommendations and suggestions made during the discussions would be given careful attention. He said that standardization was not a particular area or preserve of ISI and that standardization was the responsibility of organizations at their respective levels. As such, various construction agencies, such as Public Works Departments, major contracting organizations and engineering projects, should have 'standards cells' of their own, charged with the task of formulating departmental, project and inter-project standards and assisting in their full implementation. In this connection, ISI could make available facilities for training of personnel to man these standards cells.

S-7 Overseas Collaboration and Standardization in India

Chairman	Shri T. Swaminathan, Secretary, Department of Defence Supply, Ministry of Defence, New Delhi
Discussion Leader	Shri M. S. Dighe, Managing Director, Beacons (Pvt) Ltd, Bombay
Secretary	Shri S. M. Razvi, Assistant Director (Mech Eng), Indian Standards Institution, New Delhi
Date	17 December 1965

PAPERS PRESENTED

S-7/1	Conversion — The link between collaboration and standardization	R. Yogeshwar *and* R. S. Bir, Hindustan Machine Tools Ltd, Bangalore
S-7/2	Overseas collaboration and the role of Indian Standards Institution (ISI)	K. Sitharama Rao, A. Majumdar *and* P. E. Mathews, Indian Oil Corporation Ltd, Bombay
S-7/3	Overseas collaboration and national standards in instrument industry	Dr C. S. Rao, Instruments Research & Development Establishment, Dehra Dun
S-7/4	Collaboration needs better company standards in India	H. Bulgrin, Motor Industries Co Ltd, Bangalore
S-7/5	Influence of overseas collaboration on standardization in India	T. V. Balakrishnan *and* B. S. Bhagowalia, Heavy Electricals (India) Ltd, Bhopal
S-7/6	An approach to overseas collaboration and standardization	N. Ramajayam, Ex-Cell-O India Ltd, Bombay
S-7/7	Overseas technical collaboration and standardization — A realistic outlook	S. G. Tolpadi *and* K. Sathyanarayana, Kirloskar Brothers Ltd, Kirloskarvadi
S-7/8	Overseas collaboration and standardization	V. N. Mehta, Mahindra & Mahindra Ltd, Bombay
S-7/9	Multiplicity of refractories specifications — A bane on the Indian scene	Dr H. K. Mitra, Kumardhubi Fireclay & Silica Works Ltd, Calcutta
S-7/10	Effects of overseas collaboration and need for standardization of plastic pipes	R. D. Parikh, Chemical and Plastics India Ltd, Madras
S-7/11	Standards and collaboration in industry	Dr G. R. Toshniwal, Toshniwal Industries (P) Ltd, Ajmer
S-7/12	Overseas collaboration *vis-a-vis* standardization	B. K. Mukherjee, National Test House, Calcutta
S-7/13	Impact of overseas collaboration on Indian Standards	Dr S. Krishnamurthy, Indian Telephone Industries Ltd, Bangalore
S-7/14	Overseas technical collaboration in industrial undertakings in India : Some problems and the need for standardization	V. Jambunathan, Rajasthan Atomic Power Project, Rawathatta (Rajasthan)
S-7/15	Certain aspects of overseas collaboration and their impact on the cutting tools industry	K. Sankaranarayanan, Directorate General of Technical Development, New Delhi

OPENING REMARKS

■ The Chairman, Shri T. Swaminathan, in his opening speech, felt gratified to note that in the technical papers for the Session the entire ground of overseas collaboration and its effects on our efforts towards standardization had been covered comprehensively.

Before the papers were presented, the Discussion Leader, Shri M. S. Dighe observed in his brief talk that

overseas collaboration did prove helpful in accelerating the pace of industrial development in the country. However, in order to achieve the maximum benefit, it was necessary that the role of the Indian industry at company level, the part to be played by the overseas principals, and also the role of institutions like ISI and the manufacturers' associations at national level was well understood.

In order to provide maximum opportunity for discussion within the limited time available, the papers were divided into two groups — the first eight to be discussed in the first half and the rest in the second half of the Session.

TECHNICAL PAPERS

Group I

The paper 'Conversion — The link between collaboration and standardization' was presented by Shri Bir, who laid particular emphasis on the need for complete conversion of the principal collaborator's design to suit the Indian conditions. He stressed that while technical collaborations were indeed necessary for the rapid industrial development of the country, the local conditions should not be lost sight of and efforts must be made to operate within the framework of Indian Standards as far as possible. According to him, the country's industrial progress depended on how well the standards activity was organized and the key to successful technical collaboration lay in the conversion of the principal's designs.

Shri K. Sitharama Rao presented the paper 'Overseas collaboration and the role of Indian Standards Institution (ISI)'. The paper dealt with the problems arising as a result of overseas collaboration in the petroleum industry. It pointed out that quite often overseas collaborators were not fully informed of the local conditions and, therefore, insisted on their national standards to be followed by the Indian counterpart. This created difficulties in the petroleum industry because of the different operating conditions that existed in the country. He pleaded for greater association of ISI in the negotiations for technical collaborations.

Dr C. S. Rao in his paper 'Overseas collaboration and national standards in instrument industry' conceded that collaboration with overseas concerns helped the industry to start at a higher take-off point and, therefore, was useful for rapid industrial advancement. But the difficulties arising as a consequence of such collaboration outweighed the advantages, particularly in regard to its adverse effects on foreign exchange resources of the country. Also, such collaborations retarded the country's efforts towards self-reliance and self-sufficiency in industrial production. The tendency to depend too much on others for the technical know-how should be discarded and the efforts should be made to develop our own resources and evolve our own technical know-how. The paper cited an example of how, through research and development at the Instruments Research and Development Establishment over a period of 3-4 years, they had been able to evolve eight types of specialized equipment required in the instruments industry which were fairly comparable to those produced in advanced countries like the United States. Dr Rao, however, suggested that, if necessary, the Indian collaborator should preferably seek collaboration for intensive and extensive training of suitable Indian personnel in the principals' concerns abroad and not seek collaboration only for the production of a particular item in the country with foreign technical know-how. He suggested that the Government should seek the advice of ISI on the possible effects of future collaboration agreement on the national economy.

The paper 'Collaboration needs better company standards in India' by Shri H. Bulgrin stressed the need for an ISI Guide, giving equivalent Indian Standard steels corresponding to steels available in other countries. This would very much help the Indian manufacturers to obtain steels from any country for which they hold an import licence. The author desired a better correlation and co-ordination between Indian Standards prepared by different committees of ISI.

Shri T. V. Balakrishnan, presenting the paper 'Influence of overseas collaboration on standardization in India', observed that the overseas collaborators should be kept informed of the availability of indigenous materials and efforts made to convince them of the desirability of permitting the Indian counterpart to use materials to Indian Standard specifications. He felt that the responsibility for the change-over to Indian Standards lay with both partners in the collaboration agreement. The collaboration agreement should allow the Indian entrepreneur to substitute the standards of his principals by Indian Standards. To achieve this smoothly, the Indian unit should have its company standardization set-up with suitably qualified engineers which should maintain a liaison with ISI and the standards unit of their principals. He further appealed that the Government of India should consider setting up Central Design & Research Institutes for each type of industry.

Introducing his paper 'An approach to overseas collaboration and standardization', Shri N. Ramajayam said that neither collaboration nor standardization in itself was of any use unless it helped the industry in economizing production and ensuring better dimensional interchangeability. He felt that quite often it had not been possible to follow the Indian Standards either because the tools required for the purpose were not available, or because the Indian Standards were based unilaterally on national standards of any individual country whereby they had to make substantial changes in bringing out their product conforming to the Indian Standards. He suggested that Indian Standards should be based on prevailing corresponding international standards, and that standards should cover only performance and interchangeability requirements, wherever necessary.

Shri K. Sathyanarayana presented the paper entitled 'Overseas technical collaboration and standardization — A realistic outlook'. He detailed the problems created by overseas technical collaboration; such as multiplicity of specifications for raw materials and products; a wide variety of sizes, types and specifications of finished products; diversified nomenclatures, varying methods of design and production practice and use of different units of measurement. According to him, the burning problem of the day in the context of overseas technical collaboration with countries following fps system was metricization, and the development of company standardization activity could help in solving many of the problems.

Presenting his paper 'Overseas collaboration and standardization', Shri V.N. Mehta said that overseas collaboration had brought about a multiplicity of standards in the Indian industry. He pleaded for replacement of overseas national standards by Indian Standards in the Indian industry. In this connection, he suggested creation of company standards cells in industrial undertakings. The overseas principals may be informed of the

difficulties in using overseas standards in India indefinitely and of the need for changing over to Indian Standards.

Dr Verman's Remarks

Dr Lal C. Verman, in his reference to some authors' views relating to the initiative expected of ISI, made it clear that ISI had recommended to the Union Government that the use of Indian Standards in planning, redesigning and production might be made a condition in the collaboration agreement, though its implementation would largely depend on the Indian entrepreneur's desire, ability and experience.

While ISI could not be turned into a consulting agency during negotiations for collaboration, nor could it be expected to formulate company standards, Dr Verman assured Shri Sitaramarao of ISI's readiness to provide standards and certification service. He felt that formulation of company standards should be left to the individual industrial units, and in the case of small or new units, they could make use of the services of consulting agencies in the country for their planning and standardization programme in the initial stages. The guide, giving a detailed comparison of Indian Standard steels and corresponding steels from other countries, suggested by Shri Bulgrin, was already in print. Replying to the point relating to a conflict in the structure of Indian Standards arising from an adoption of overseas standards as Indian Standards, Dr Verman stressed that the raw material needs and other needs requiring co-ordination between different standards were never ignored in formulating Indian Standards; there was the organizational control from within and soliciting of views of the technical personnel from without by putting draft standards into wide circulation. He denied that the Indian Standards were based on the unilateral judgement of one country. The procedure for drafting Indian Standards was quite elaborate and the standards were based only on Indian needs. Technical know-how was obtained from wherever available, investigations carried out and examination made wherever necessary and only then Indian Standards were evolved. This was one of the reasons, he observed, for the enormous time consumed in standard formulation. Dr Verman requested everyone to keep a watch and assist ISI to pursue a desirable course whenever there was likely to be some slip.

The Session on 'Overseas Collaboration and Standardization in India: at the head table from left to right are Shri S. M. Razvi, Secretary; Shri T. Swaminathan, Chairman; Shri M. S. Dighe, Discussion Leader; and Dr Lal C. Verman

Discussion

During the discussion, Shri A. R. Palit supported the plea for laying emphasis on design conversion, which he said embraced everything we do, that is, pre-design value analysis for functional utility in terms of work and cost in India, prestige value and the national importance of the items. Shri V. S. Bhatia said that overseas standards could be made use of wherever necessary, particularly in the case of items for which an Indian Standard was not available.

According to Mr H. E. Riebensahm, the Indian entrepreneur should supply all possible information to the overseas collaborators beforehand in which case the latter might agree to change the design to suit Indian conditions.

Shri P. S. Kashyap drew attention of the gathering to the cost of various components going into the manufacture of an end-product. If these components manufactured to Indian Standards were available in the country, the Indian counterpart must stress on his overseas principals to allow him to use these in the manufacture of the end-product. He cited the example of electric motors manufactured to Indian Standards which had the same dimensions as recommended by the International Electrotechnical Commission; the use of these could be permitted by overseas principals.

While Shri A. P. Seethapathy cautioned against going to extremes of trying to manufacture everything indigenously or entering into collaboration for every item, Shri S. K. S. Mudaliar advocated a judicial assessment of the extent of the overseas collaborator's requirements that could be met and the extent to which the components could be made to Indian Standards.

Shri S. K. Maini laid stress on associating the overseas collaborator through finanical stake which would more likely make him see the Indian conditions more objectively.

Shri S. G. Ramachandran felt that the problem was essentially due to the difference in the level of technological development in our country and industrially advanced countries. Touching upon a suggestion made by some authors that some consulting organizations should be set up, he said that the Institution of Engineers at Bangalore had already set up such a cell to keep the industries posted with the progress of Indian Standards.

Many participants in the discussion insisted on immediate adoption of Indian Standards by all the companies and suggested speedy preparation of standards for raw materials also. A few were of the view that ISI was there to set up national standards, and it was the responsibility of the companies to evolve their company standards based on Indian Standards.

Shri T. N. Subbarao who saw no harm in collaboration said that as under the collaboration agreement royalty for research was paid by the Indian industry, the results of researches must be made available by the overseas collaborator to the Indian counterpart for the progress of Indian industry.

Group II

Dr H. K. Mitra in his paper 'Multiplicity of refractories specifications — A bane on the Indian scene' brought out the difficulties arising from the use of a large number of specifications for refractories for the

same purpose in the country, which were, in turn, the result of collaboration with firms from overseas countries specifying their own national standards for the joint industrial venture. There was no justification for importing more overseas specifications as had been done in the past. Dr Mitra suggested that in the initial stages of negotiations for collaboration, there should be a meeting at the Government level between foreign collaborator and the Indian counterpart, including representatives of ISI, when the collaborator should be given detailed information about the Indian Standards and raw materials available in the country.

Introducing his paper 'Effects of overseas collaboration and need for standardization of plastic pipes', Shri R. D. Parikh suggested the laying down of Indian Standards for PVC pipes, to cover, in particular, the outside diameter and the jointing method which had a direct bearing on the dimensions.

In his paper 'Standards and collaboration in industry', Dr Toshniwal suggested that while foreign technical know-how could be made use of through collaborations, Indian industry should pay proper attention to research so as to be able to design new instruments after a few years experience under collaboration. He pointed out that there was too much of dulpication of research work in the country and suggested proper co-ordination between research organizations. Each factory should have very strong research, development and standardization department. Besides attending to standardization work, this department should try to avoid use of as many foreign components as possible, use as little as possible foreign raw materials, find out alternate raw materials and utilize components conforming to Indian Standards wherever possible. For this purpose he also pleaded that Government should give encouragement by way of subsidies for formation of research cells on co-operative basis.

Shri B. K. Mukherjee's paper 'Overseas collaboration *vis-a-vis* standardization' appreciated the need for collaboration in the interest of industrial progress, but stressed that the ultimate product of the Indian factory having collaboration arrangement should conform to Indian Standards. Shri Mukherjee thought that ISI could play an important role in overseas collaboration, by giving a radar-like approach and offer proper guidance to both the overseas collaborator and the Indian counterpart.

Presenting his paper 'Impact of overseas collaboration on Indian Standards', Dr S. Krishnamurthy cautioned that quality of a product should not be sacrificed in an effort to Indianize its manufacture. He further said that it was also necessary to have a department in every organization to look after the work of standardization. Relevant company standards originally based on overseas standards should be modified to bring them in line with Indian Standards. Linking of overseas standards with Indian Standards, acceptance on the part of the overseas collaborators to the use of indigenous raw materials, consulting ISI before considering an application for collaboration were some of the other suggestions made by Dr Krishnamurthy.

Presenting his paper 'Overseas technical collaboration in industrial undertakings in India: Some problems and the need for standardization', Shri V. Jambunathan dealt with the need for formulation of a standard form of contract for technical and financial collaboration with all overseas countries. He suggested that overseas collaborators should be supplied with all possible information on the local conditions, the Statutory Acts and Regulations for the industry so that a proper installation design could be worked out suiting indigenous conditions.

In his paper 'Certain aspects of overseas collaboration and their impact on the cutting tools industry', Shri K. Sankarnarayanan observed that overseas collaboration resulted in multiplicity of standards in this field, which impeded the progress of standardization in the country. He suggested that the collaborators should try to assist Indian firms in conversion of tools and tooling to Indian Standards enabling the use of such tools to the maximum extent possible. Assistance should also come forth in any modification or alteration of their designs to suit the Indian conditions, in utilizing local sources of raw materials for production; and in the promotion of design and research talent in India.

Discussion

In the discussion that followed, Major-General Harkirat Singh agreed that there was need for collaboration with industrially advanced countries, but did not favour the tendency to enter into collaboration for the same product over and over again. He urged that to make progress, we should have collaboration for one type of product only once, and if new firms wanted to take up the manufacture of that product, they should seek the assistance of the first Indian firm which has had the advantage of getting foreign technical know-how under the collaboration agreement. He also felt that package deals were dangerous and most unprofitable for the country.

Shri Bathena desired the continuation of both fps and metric standards as some of the developing countries of Africa using only fps system might seek India's assistance and collaboration.

Shri S. Shivananda Swamy explained through the help of drawings how, even though they were having collaboration with a German firm, they were able to use Indian Standard specifications in their design; where Indian Standards were not available, they were following the ISO and IEC Recommendations. He also supported the plea made by Shri Bir for complete design conversion.

DISCUSSION LEADER'S REMARKS

Summing up the discussion, Shri M. S. Dighe observed that the deliberations had been quite useful. The authors and delegates had touched on different aspects of collaboration — the work that should be done before signing a collaboration agreement, the information that should be collected beforehand and supplied to the overseas collaborators at the negotiation stage, terms of agreement which would be fruitful to both parties, method of bringing about metricization in Indian industry, desirability of establishing company standards, Government's role in setting up research and development centres, how the institutions like ISI and other manufacturers' associations could help the industry in achieving standardization at the national level, etc. Besides this, he felt that while Indian Standards were very necessary, they should be as close to international standards as possible, as that would help us in our export drive and facilitate interchangeability. All these points, he said, required careful attention for deriving the maximum benefit of collaboration and standardization.

CHAIRMAN'S CONCLUDING REMARKS

In his closing remarks, the Chairman said that overseas collaborations had made standardization difficult. However, standardization and substitution could bring about economy in the country's industrial production and conserve foreign exchange. He felt that a suitable clause may be added in the collaboration agreements that any component or raw material which was available in the country to Indian Standards should be used by the Indian collaborator and, if necessary, the overseas principals' design should be changed to that extent. Now that we were at a take-off stage, he felt the overseas collaborators would fall in line with us.

In regard to metricization in the Indian industry, Shri Swaminathan felt that there appeared to be some contradictory views among the delegates on this issue. Citing the example how certain continental countries were supplying equipment and machinery in fps system even though they had adopted metric system themselves, he said that it was not impossible to use both the systems. However, in view of the international trend towards metric system, he advised that we should try to enforce metric system in our industry as early as possible.

On behalf of the participants, Dr Lal C. Verman thanked the Chairman for conducting the deliberations of the Session excellently. He also thanked Shri Dighe for giving professional lead to the technical discussion and making the Session a success.

S-8 Documentation and Library Housing

Chairman	Dr S. R. Ranganathan, National Research Professor in Library Science, Documentation Research & Training Centre (DRTC), Bangalore
Discussion Leader	Prof A. Neelameghan, Documentation Research & Training Centre (DRTC), Bangalore
Secretary	Shri Jainath Kaul, Chief Editor, Indian Standards Institution
Date	18 December 1965

PAPERS PRESENTED

Group A Problems in the Chain Procedure Used as a Means to Arrive at Subject Headings

S-8/A : 1	Homonym in subject heading : Case studies	A. Neelameghan and M. A. Gopinath, Documentation Research & Training Centre, Bangalore
S-8/A : 2	Style and rendering of subject headings in a frozen bibliography	Sugra Begum, Polytechnic for Women, Bangalore, and Afroze Fathima, Hindustan Machine Tools Ltd, Bangalore
S-8/A : 3	Composite terms *vs* constituent isolate terms in subject heading : A study for standardization	V. V. Parthasarathy, Technical Information Division, Semiconductors Ltd, Poona
S-8/A : 4	Style and rendering of feature headings derived by chain procedure in a printed frozen classified documentation list	D. Gundu Rao, Bharat Electronics Ltd, Bangalore

Group B Code of Practice for Preparation of Subject Headings in English and Indian Languages

S-8/B : 1	Code of practice for the preparation of subject headings in Marathi	R. S. Parkhi, 759/13, Beccan Gymkhana, Poona
S-8/B : 2	Subject headings in Gujrati	C. P. Barot (Retired Librarian), Gujarat Vidyapeth Granthalaya, Ahmedabad
S-8/B : 3	Code of practice for the preparation of subject headings in Malayalam	K. A. Isaac and M. N. Ramakrishnan, University of Kerala, Trivandrum
S-8/B : 4	Subject headings : Chain indexing : Telugu	C. V. Subba Rao, Indian Statistical Institute (Library), Calcutta
S-8/B : 5	Construction of Bengali subject heading by chain procedure	P. B. Roy, Commercial Library, Calcutta, and Ganesh Bhattacharyya, Indian Statistical Institute, Calcutta

OPENING REMARKS

■ At the request of the Chairman, Shri Jainath Kaul gave a brief account of the work done in ISI in different areas of documentation and also the type of membership on the Documentation Sectional Committee.

The Chairman, Dr Ranganathan, in his opening remarks, observed that the Convention was meant as a medium for loud thinking on the various issues arising out of the papers presented. These issues have an important bearing on the preparation of Indian Standards in the respective subjects. He explained that since the papers had already been distributed, they would be taken as read. There were many points on which, obviously, discussion could not be completed within the short period available. A committee had, therefore, formulated certain propositions concerning controversial points covering several of the papers in each of the areas. In order to make the best use of the time at the disposal of the Session, it was decided that some of the issues arising out of the papers listed above could best be left for discussion in greater length during the five-day DRTC Seminar due to begin the next day. This was possible because many of the delegates to the Documentation Session of the Convention were also delegates to the DRTC Seminar. The Chairman mentioned that in view of this, papers in Group B would not be taken up. Papers under

Group C Abbreviation of Titles of Periodicals in Indian Languages

S-8/C : 1	Abbreviation of titles of periodicals in Bengali	Ganesh Bhattacharyya, Indian Statistical Institute (Library), Calcutta
S-8/C : 2	Problems of abbreviations of titles of periodicals in South Indian languages	V. Thillainayagam, Connemara Public Library, Madras
S-8/C : 3	Problems of abbreviations of titles of periodicals in North Indian languages	G. P. Srivastava, ISI, New Delhi
S-8/C : 4	Problems of abbreviations of titles of Tamil periodicals	Dr M. Varadarajan, University of Madras, Madras
S-8/C : 5	A study of 1 286 titles of Indian learned periodicals	S. Dutta, INSDOC, New Delhi
S-8/C : 6	A study of titles of learned periodicals in Indian languages	N. K. Goil, Institute of Economic Growth, New Delhi

Group D Canons for Establishing Technical Terminology in Indian Languages

S-8/D : 1	Standard for scientific terminology	Dr S. R. Ranganathan, National Research Professor in Library Science, DRTC, Bangalore
S-8/D : 2	Canons for establishing technical terminology in Indian languages	R. P. Jaiswal and Dr D. V. Bal, Commission for Scientific and Technical Terminology, New Delhi
S-8/D : 3	The problems of standardization of scientific and technical terminology in Indian languages	Dr Gopal Sharma, Central Hindi Directorate, Ministry of Education, New Delhi

Group E Review of Technical Glossary for Different Disciplines

S-8/E : 1	Classified arrangement in a glossary of technical terms	A. Neelameghan, Documentation Research & Training Centre, Bangalore
S-8/E : 2	Structure of an entry in a glossary of technical terms	A. Neelameghan, Documentation Research & Training Centre, Bangalore
S-8/E : 3	A review of technical glossary and documentation work in Hindi (with special reference to building science)	G. C. Mathur, National Buildings Organization, Ministry of Works & Housing, New Delhi

Group F Presentation of a Project Report

S-8/F : 1	Technical report writing	Dr S. R. Ranganathan, National Research Professor in Library Science, DRTC, Bangalore
S-8/F : 2	Presentation of a project report with particular reference to the chemical industry	Padmakant R. Shah, National Rayon Corporation Ltd, Mohone, Kalyan (Bombay)

Group G Standardization of Library Buildings of Different Types

S-8/G : 1	A need for a survey of library architecture fittings and furniture in India	N. B. Marathe, Central Reference Library, Calcutta
S-8/G : 2	Micro document, depth classification and flat filing equipment	C. V. Subba Rao, Indian Statistical Institute (Library), Calcutta

Group F and G could also not be taken up for discussion for want of time.

PRESENTATION AND DISCUSSION OF PROPOSITIONS

Group A

Shri V. V. Parthasarathy, author of the paper 'Composite terms *vs* constituent isolate terms in subject heading: A study for standardization' (A : 3), presented the following proposition:

'In subject headings, as far as possible, constituent isolate terms should be used instead of composite terms.'

He explained that there was need only to refer from the composite terms to the constituent isolate terms and not both ways, that is, reference from the constituent isolate terms to the composite terms, and also from the composite terms to the constituent isolate terms. The economy gained in this was illustrated in the discussion. It was pointed out that there was provision in the rules of Chain Procedure to make subject headings under all Sought Headings, whether they are composite terms or constituent isolate terms, according to the Canon of Sought Headings. It was also indicated that a class number was not essential for the derivation of subject headings. From the fifth step in the Postulational Approach, one can either take the subject headings directly or translate the isolates into a class number according to the scheme of classification.

Group C

The first proposition worded as under was moved by Shri S. Dutta, author of the paper 'A study of 1 286 titles of Indian learned periodicals' (C : 5):

'One-worded titles of periodicals in Indian languages should not be abbreviated even when the title is a word coalesced by *Sandhi* and *Samasa* rules.'

He said that the question to be decided was, 'what was a one-worded title'. He also pointed out that the analysis of over 1 200 titles of Indian periodicals showed that more than 35 percent contained only one word and more than 60 percent contained only two words.

Shri S. P. Phadnis (INSDOC, New Delhi) pointed out that the Subcommittee of ISI on Abbreviation of Titles of Periodicals in Indian Languages had discussed the problem in some detail and had arrived at the tentative conclusion that a one-worded

Group H Evaluation of Existing Indian Standards on Library Buildings, Fittings and Furniture

S-8/H : 1	Library housing — Neglect of the Indian Standards — What can be reason	Dr S. R. Ranganathan, National Research Professor in Library Science, DRTC, Bangalore
S-8/H : 2	Role of an archivist in implementing the Indian Standard Code of practice relating to primary elements the design of building for archives, IS : 2663-1964	R. C. Gupta, National Archives of India, New Delhi
S-8/H : 3	Certain compelling factors governing design and dimensions of building fittings and furniture for libraries	C. Seshachalam, Curzon & Co., Madras

title should include also a title which contains a word coalesced by *Sandhi* and *Samasa* rules. But if the words were just juxtaposed without any morphological or grammatical variations and forms they could be treated as two words.

The second proposition was amended to read as:

'An abbreviation should not be taken beyond the point of intelligibility in its context.'

It was explained by Shri G. P. Srivastava (ISI) that the proposition aimed at avoiding any homonym or confusion which might arise if the titles were abbreviated too much, such as having only the first letter of the word.

The Chairman explained the background of the work of the Subcommittee on the Abbreviation of Titles of Periodicals in South Indian Languages. He pointed out that in a title the terms encountered most frequently required to be abbreviated were those which denoted that the document was a periodical. There were other generic terms denoting subject covered by the periodical and names of places. After a great deal of struggle and analysis of a large number of titles of periodicals in South Indian languages in particular, it was found that there were very few generic terms indicating that the document was a periodical; that in a majority of the cases the words were not descriptive of the subject covered by the periodical but proper names, or poetic names and there were very few cases in which the name of the place occurred.

During the discussion, it was pointed out that whatever be the name given to a periodical, the words in it should be taken as they are and abbreviations attempted for them. If any initionym or abbreviated name is used in the title of the periodical, it should not be expanded. If there was likely to be a homonym between the names of two or more periodicals they should be individualized in the usual way.

Group D

The following five propositions were moved by Dr Gopal Sharma, author of the paper 'The problems of standardization of scientific and technical terminology in Indian languages' (D : 3):

1) International terms well in use, and those getting established to denote new concepts in the mathematical, physical and bio-sciences and their applications, should be adopted as bases, and the peculiarities of the Indian languages should be limited to the extent of morphological variations, such as are necessary for the forms in different cases, numbers, tenses, etc of the base.

2) Foreign words already current among the people concerned in the country in the fields of natural sciences and their several applications should be retained as such, without being replaced by words of Indian origin.

3) In all other cases, where desirable, equivalents from Indian languages should preferably be adopted.

4) For technical terms which cannot be adopted as such, and for which equivalents from Indian languages are also not available, Sanskrit words may be adopted or new words coined.

5) As far as possible, the technical terminology laid down by the Central Agency in the Union Ministry of Education, namely, the Commission for Scientific & Technical Terminology (formerly called the Board of Scientific and Technical Terminology) should be used with minimum essential linguistic modifications necessary for each regional language.

Moving the propositions, Dr Gopal Sharma explained in some detail, with illustrations, the need for developing canons for guidance in the adoption, adaptation and creation of terms in Indian languages. It was generally agreed that these propositions may be taken as a useful set of canons for the purpose.

Group E

Moving the proposition that 'It is helpful to the specialist to have the glossary of technical terms in a classified sequence with an alphabetical index', Prof A. Neelameghan (DRTC) explained the difference in the function between the dictionary and a glossary. On the basis of this differentiation in function, it was pointed out that a classified sequence with an expressive notation and adequate feature headings, and an alphabetical index of the terms has the following advantages over the alphabetical arrangement:

a) Provides a compact picture of the discipline as a whole, and also of each of its subdivisions.

b) The relation between the concepts connoted by each term is more helpfully delineated than in an alphabetical arrangement.

c) If an expressive mnemonic notation is given to each of the terms, as in the 'Indian Standard glossary of classification terms', it will be a further help to display the intention and extension of a term in relation to the ones preceding and following it.

d) Consequently, there is a facility in the flow of thought from one term to the next.

e) Each term gets pinpointedly defined in the specific context of the discipline as a whole and of its appropriate subdivision.

f) The chances of misinterpretation of a term out of its context are considerably reduced if not altogether eliminated.

g) The fault of homonym is avoided.

h) Even if the specialist is not quite sure of a term — say the spelling or meaning — he can be directed to the appropriate part of the glossary using a related term; there he will find all the terms for the related concepts helpfully displayed such that he can locate the correct term.

j) Similarly, when two or more terms suggest themselves for use in a particular context, the classified glossary will be more helpful in choosing the most appropriate term.

k) The problem areas in terminology of the discipline needing further clarification get better demarcated.

m) The less developed areas in the discipline itself get exposed, thus

further lines of study would be suggested.

n) The explanation and definition for each term can be made compact and short, taking the help of the Canon of Context.

The Chairman, after tracing the history of development of glossary, pointed out that if it was a matter of discreet things we would have an alphabetical arrangement, but in the case of connected concepts a classified system was more helpful. However, more experience was necessary. He said that more classified glossaries should be produced in different subjects and then the reaction of the users should be found out to arrive at some helpful conclusions.

Group H

Shri C. Seshachalam, author of the paper 'Certain compelling factors governing design and dimensions of building, fittings and furniture for libraries' (H : 3), moved the following proposition:

'Whenever an architect, engineer, archivist, or library authority finds it difficult or undesirable to conform to the dimensions recommended by the Indian Standards Institution for the library fittings and furniture, and for the rooms in a library building, he should inform the Indian Standards Institution about the changes he would suggest in the prescribed standards along with reasons therefor, so that the existing standards may be reconsidered or new standards developed, if necessary, by the Indian Standards Institution.'

He explained that there were certain compelling factors which should be taken into account in laying down standards for library buildings, fittings and furniture. These factors are concerned with functional economy, the average size of the book, and anthropometric considerations. He stressed the importance of modular co-ordination in building structures. He illustrated the various points using as example, the display rack for current periodicals and unit book racks based on the Indian Standard specifications. There was no question of any freezing of design. The standards only aimed at achieving maximum efficiency and functional economy, he said.

The difficulties arising from lack of awareness of the purpose and value of the standards and the imperative need for implementing these standards in the interest of national economy were highlighted in the discussion.

Shri Jainath Kaul, then, read out the observations on this issue made by Shri Erach A. Nadirshah, a former Chief Engineer of Cement and Concrete Association of India and Vice-President of ISI. It was stated that while it was convenient to adopt these standard dimensions, applying anthropometric measurements, for various items of furniture and fittings when building up new libraries, it might not be practicable to adopt the standards in existing libraries, except at great cost in money and time. In the absence of any careful planning or thought, many of our older libraries had inherited over the years, a great many odd bits of furniture and fittings. It would be difficult to discard these in view of the cost involved. However, wherever possible, they should be redesigned to meet the requirements of the standard, or gradually replaced depending on the financial resources of the library, suggested Shri Nadirshah.

There was an increasing awareness that the implementation of these standards should ensure a certain amount of physical comfort and give psychological satisfaction to the users by the pleasant atmosphere and the ready service offered by the library.

In the discussion, it was suggested that a survey should be made to find out the actual problems involved in implementing the standards.

At the request of the Chairman, Dr Visvesvaraya explained in some detail the work already done in sending out questionnaires to a large number of institutions to find out the difficulties involved in implementing the standards, and also the areas where there were no standards. Most of the answers to the questionnaire were evasive and did not pin-point the technical problem, if any, involved in implementing the standards.

CONCLUSION

The Chairman thanked the authors for their valuable contributions and for the lively interest shown by the participants in the deliberations.

On behalf of ISI, Dr Lal C. Verman expressed his gratitude to Dr S. R. Ranganathan for accepting the chairmanship of the Session and for conducting its proceedings in an effective, interesting, and efficient manner.

S-9 Standardization as a Tool for Export Promotion

Chairman	Shri Manubhai Shah, Union Minister of Commerce, New Delhi
Secretary	Shri C. N. Modawal, Director (Quality Control), Ministry of Commerce, New Delhi
Date	17 December 1965

PAPERS PRESENTED

S-9/1	Standardization and India's export problems	Col S. K. S. Mudaliar, Survey of India, New Delhi
S-9/2	Impact of standardization on foreign trade	A. P. Banerji, ISI, Calcutta
S-9/3	Importance of testing laboratories in the context of standardization for export promotion	B. K. Mukherjee, National Test House, Calcutta
S-9/4	Use of Indian Standards for export promotion	R. C. Das Gupta, National Test House, Calcutta
S-9/5	Quality control and inspection as an aid to export promotion	B. B. Chakraverti, Superintendence Company of India Private Ltd, Calcutta
S-9/6	Standards and specifications as tools for export promotion and the role of consulting engineers	A. V. Nath, Institute of Consulting Engineers, Madras
S-9/7	Some aspects of standardization of the manufacture of myrobalan (*Terminalia chebula*) tannin extract	C. Koteswara Rao and Dr Y. Nayudamma, Central Leather Research Institute, Madras
S-9/8	Problems of standardization of exportable tobacco leaf	Dr D. M. Gopinath and Dr M. K. Chakraborty, Central Tobacco Research Institute, Rajamundry
S-9/9	Standards for sugar for export purposes	S. C. Gupta and N. C. Verma, National Sugar Institute, Kanpur

S-9/10	Standardization of animal casings for export	Dr S. K. Barat, Central Leather Research Institute, Madras
S-9/11	Role of Indian Standards in export promotion of electrical products	V. S. Bhatia, Siemens Engg Mfg Co of India Ltd, Bombay
S-9/12	Gains in standardization of polyphase induction motors for outputs up to 1 000 kW	Dr A. K. Goswami, Heavy Electricals (I) Ltd, Bhopal
S-9/13	Development of rail specifications by Indian Standards Institution for internal and export purposes	P. R. Ahuja, Bhilai Steel Plant, Bhilai
S-9/14	Role of standardization in export promotion with special reference to chemicals and allied products	M. B. Desai, The Kesar Sugar Works Ltd, Bombay
S-9/15	Export promotion with special reference to promotion of exports of ferro-manganese and manganese ore	A. Sangameswara Rao, Ferro Alloys Corporation Ltd, Shreeramnagar
S-9/16	Standardization of mineral commodities and its impact on their exports from India	A. M. Hussain, Indian Bureau of Mines, New Delhi
S-9/17	Role of statistical quality control in export	Dr (Miss) S. P. Vaswani, N. C. Corporation Pvt Ltd, Bombay
S-9/18	A rapid method of determination of minor quantities of iron in nickel—A tool for quick preshipment inspection of goods of commerce	V. M. Bhuchar and V. P. Kukreja, National Physical Laboratory, New Delhi

OPENING REMARKS

■ In his opening remarks, Shri Manubhai Shah called for positive and concerted action by the nation as a whole to achieve self-reliance. He stressed that for maintaining a high level of production and avoiding imbalance in economy we have to resort to conservation of foreign exchange resources through import substitution and stepping up of exports. He added that standardization was the only weapon to meet effectively the multiple challenges of price, quality and consumer satisfaction. Shri Manubhai Shah exhorted all agencies working in the field of production, assembling, processing and marketing—official as well as non-official—to break from the past legacy and create an image of the country producing quality goods at economical cost. The introduction of better production techniques, adherence to standards, and better presentation and after-sale-service were the measures required in that direction. As deficiency in agricultural economy was likely to continue for the next 5 to 10 years, it was very necessary that the country switched over to increased production of manufactured and sophisticated products for export purposes.

Expressing satisfaction over the working of the compulsory quality control and pre-shipment inspection activities introduced for various items, the Minister said that these should not be thought of as Government's policing measures but as self-regulatory developmental measures to help export trade. Quality control measures were not only a good policy but they also resulted in better price realization.

As a seller, our country had to respect the requirements of the buyer. Standardization did not necessarily mean adherence to standards framed by the selling country but adherence to standards required by the purchasing country also. Besides, adequate attention should be paid to packaging standards also. Quality should be built into the product, in its specification as well as in its packaging and presentation so as to impart it a 'buy-appeal'. Manufacturers should bear in mind that what is well presented is well accepted.

At the end of the Fourth Plan, India's export trade would be of the order of about Rs 12 000 million annually. Of this, goods valued at about Rs 8 000 million would be in the form of packaged materials. It was important, therefore, to give adequate attention to packaging techniques not only with a view to providing safety during transit but also attracting the foreign buyer.

Dwelling on the dearth of trained personnel in the field of standardization and quality control and on the non-availability of adequate testing facilities, the Minister assured that any organization desirous of setting up laboratories and testing houses for export trade would receive all encouragement and facilities from the Government; there would be no hindrance in obtaining special types of instruments for which the question of foreign exchange was involved.

PRESENTATION AND DISCUSSION OF TECHNICAL PAPERS

For the convenience of discussion, the papers were grouped as shown below:

a) General (S-9/1 to 6 and 17),

b) Food and Agricultural Products (S-9/7 to 10),

c) Engineering Products (S-9/11 to 13), and

d) Chemicals and Ores (S-9/14 to 16 and 18).

General

In his paper 'Standardization and India's export problems (S-9/1)', Col S. K. S. Mudaliar stressed that amongst the various factors contributing to the export promotion of a country, management personnel of technical establishments and manufacturing units had an important role to play. He stated that technical and scientific management training to executives in private and public undertakings would create confidence in the industry for implementing the various standardization schemes, such as company standardization, national standardization and international standardization. He suggested that the United Nations might play a useful role in organizing periodical seminars and consultations of top executives and allied organizations like ISI, NPC and user-departments. Shri Mudaliar had no doubt that a system of technical documentation for assisting exchange of knowledge and service between nations would be of immense use.

Shri A. P. Banerji's paper 'Impact of standardization on foreign trade (S-9/2)' stressed that for competing in the world market, India should change her pattern of trade from traditional items to manufactured goods. Further, it was suggested that as an export promotion activity, standardization and compulsory quality control and pre-shipment inspection measures should be adopted as recommended by Verman Committee on Quality Control and Pre-shipment Inspection. Adoption of ISI Certification Marks Scheme would also be a healthy step towards this end.

Shri B. K. Mukherjee made a pointed reference in his paper 'Importance

of testing laboratories in the context of standardization for export promotion (S-9/3)' to the extreme dearth of testing facilities in the country and suggested the setting up of zonal laboratories at different export points. The items to be handled by the zonal laboratories should be decided after a thorough study of the specific kinds of goods which would be exported from a particular export point. For coordinating the work of all the zonal laboratories, the author also suggested setting up of a central laboratory like the National Test House.

Welcoming the Union Government's step to enact the *Export (Quality Control and Inspection) Act, 1963* for organizing export trade on sound lines, Shri R. C. Das Gupta in his paper 'Use of Indian Standards for export promotion (S 9/4)' recommended compulsory implementation of Indian Standards at least for purposes of export. Provision of facilities for the import of scarce raw materials and export duty and tax concessions were recommended, as incentives, to such of the manufacturers who adopted Indian Standards for export purposes.

The paper 'Quality control and inspection as an aid to export promotion (S 9/5)' by Shri B. B. Chakraverti touched upon the necessity of quality control for goods meant for export. In addition to quality control, consignment inspection would help the export promotion drive. The practice of testing the superintendence of goods for export through an impartial body was not new in the country. Many private inspection agencies were functioning in the country, and to avoid duplication, Government should take steps to recognize them under the provisions of the *Export (Inspection and Quality Control) Act*.

Shri A. V. Nath's paper 'Standards and specifications as tools for export promotion and the role of consulting engineers (S-9/6)' suggested that standards and specifications could be effective tools for export promotion, import substitution and for promoting the industrial growth in the country. Consulting engineers, he said, could play an important role in this direction and render useful service to the nation.

That quality could not be inspected into a product but must be built into the product, was stressed in the paper 'Role of statistical quality control in export (S-9/17)' by Dr (Miss) S. P. Vaswani. SQC techniques were no doubt necessary for improving the quality of products meant for export. Mere laying down of standards was not sufficient, their conformity had also to be ensured. She suggested the avoidance of manufacture of 'off-limits' production, for inspection did not always eliminate the risk of a bad lot passing out as a good lot. She also suggested that SQC techniques might be used for better control systems of inventory and stocks in various manufacturing units.

Dr Lal C. Verman, Director ISI, welcomes Shri Manubhai Shah, Union Minister of Commerce, who presided over the Session 'Standardization as a Tool for Export Promotion'

Discussion—In the discussion that followed, Shri C. N. Modawal revealed that the Government had already decided to set up laboratories and testing houses at important export points for the convenience of exporters. The Government had also recognized some 22 private inspection agencies in the country for the pre-shipment inspection of engineering products, chemicals, minerals and ores.

Dr S. Krishnamurthy suggested the necessity for laying down standards for seaworthy packaging of exportable goods. On a point raised by Dr Toshniwal, it was stated that the Government was making full use of the available testing facilities in the factories.

Food and Agricultural Products

The paper 'Some aspects of standardization of the manufacture of myrobalan (*Terminalia chebula*) tannin extract (S-9/7)' presented by Dr S. K. Barat on behalf of the authors, ascribed the recent fall of exports of myrobalan extract to the preferential choice for the raw nut by the importing countries as well as to the increased consumption within the country. Nevertheless, the export market for the extract could be maintained on an improved basis if the extracts of guaranteed quality could be produced.

An essential step towards that end was the process-control during the manufacture of extracts in conformity to 'IS : 2716-1964 Specification for myrobalan extract' from selection and grading of raw material to the preparation of solid or spray-dried extract and packing.

Dr M. K. Chakraborty, while presenting the paper 'Problems of standardization of exportable tobacco leaf (S-9/8)', said that improvement in foreign trade with respect to Indian flue-cured tobacco required the creation of technical confidence in the overseas buyers about the product. Similar to other exportable commodities, this might be achieved by certification marking schemes already sponsored by ISI. But with the changing concept of leaf quality and trade requirements, more sophisticated specifications were necessary to suit the equally sophisticated buyers. The author referred to the attempts being made at the Central Tobacco Research Institute to recognize and rigorously define quality characteristics and to evolve simple and easily adoptable laboratory tests. On the basis of the studies and researches done at the Institute, it might be possible to revise the grading system according to plant position and to bring it in conformity with other tobacco-producing countries of the world.

With India's entrance into the world sugar market, it was probable that raw sugar would become a prominent export commodity of the country. With this in view, Shri N. C. Verma, in his paper 'Standards for sugar for export purposes (S-9/9)', laid emphasis on the production of raw sugar of proper standards. Most of the overseas buyers needed raw sugar which they refined in their own refineries. Since the process and equipment of refining raw sugar varied, they needed the type of raw sugar which suited their individual techniques.

Dr S. K. Barat in his paper 'Standardization of animal casings for export (S-9/10)' said that India, with her largest livestock population in the world, could develop a sizeable export market for animal casings. He mentioned that the factors retarding the export of casings were lack of proper know-how in the processing, lack of standardization and quality control in the product and adoption of conventional method of wet salting. While suggesting rectification of these factors, he drew attention to the new process for scientific treatment of casings developed by the Central Leather Research Institute (CLRI). Since these casings were used as foodstuffs, it was imperative that maximum care was taken during the manufacture starting from the slaughter-houses. The products produced by the process developed by CLRI would be absolutely clean, dry, ready-to-use form, and instantly capable of being soaked back to their original soft and flaccid conditions. Specifications for such products could easily be laid down. The author also suggested that the slaughter-houses should conform to the requirements of international food regulations.

Discussion — During discussion, Dr Lal C. Verman suggested that besides qualitative standards for tobacco, quantitative standards might now be prepared. This was an aspect to be borne in mind by the Central Tobacco Research Institute. Dr M. S. Patel stated that formulation of standards for any commodity was a time-consuming process and, therefore, it would be necessary to think ahead of time and formulate specifications for any product. Tobacco was no exception to it. In regard to grade specifications, he stated that Indian Standard grades corresponding to the international standards for the item had already been prepared. However, cigar tobacco grades were yet to be fixed. In order to assist the various people connected with the commodity, the Tobacco Export Promotion Council

Shri Manubhai Shah addressing the Session

Shri M. S. Patel, Chairman, Tobacco Export Promotion Council, Madras, speaking at the Session. Seated on the dais are Shri C. N. Modawal, Secretary; Shri Manubhai Shah, Chairman; and Dr Lal C. Verman

had also standardized samples of tobacco, replicas of which were kept with the Council for reference.

A suggestion was made by a delegate that in regard to the export of myrobalan, it might be worthwhile considering grading of the raw nut for export purposes. Dr S. K. Barat, replying on behalf of the authors, said that restricting the supply of raw myrobalan for export purposes would not solve the problem inasfar as there were ample substitutes for the nut in regard to the usage it was put to.

Engineering Products

Presenting the paper 'Role of Indian Standards in export promotion of electrical products (S-9/11)', Shri V. S. Bhatia high-lighted the utilitarian aspect of Indian Standards. Achieving interchangeability of parts, ensuring safety in use by laying down minimum requirements, obtaining minimum efficiency in performance, etc, were the essential needs generally fulfilled by a standard. As far as electrical products were concerned, even compulsory ISI Certification Mark would be welcome. He, however, mentioned that ISI Certification Mark only indicated that the product conformed to the corresponding Indian Standard, but it did not by any means indicate whether the product was up to the quality required according to the consumer specifications. Shri Bhatia suggested that ISI should study the national standards of other countries and make available to the purchaser as well as to the producer a comparison of these standards with Indian Standards. The Indian producers, therefore, had to realize that manufacturing a product according to the national standards was the bare minimum that was expected.

The paper 'Gains in standardization of polyphase induction motors for outputs up to 1 000 kW (S-9/12)' by Dr A. K. Goswami analysed the present state of affairs in the matter of standardization of polyphase induction motors. A standard specification could be regarded as a short-hand notation defining the essential properties of an article offered for sale. A contract of sale could thus be made subject to the article conforming to a standard specification with all the safeguards of the legal implications. In case of polyphase induction motors, national standards and international specifications were available, but with the rapid technological changes and automation of industries, these standards required periodic review to match the changing requirements. As an instance, the paper quoted that 'IS : 325-1961 Three-phase induction motors (*second revision*)' stipulated 'preferred outputs' only up to 250 kW but recent experience suggested that this range could be conveniently extended up to 1 000 kW. Focussing attention on the existing national and international standards for rotating machines, the paper brought out some technical inadequacies in them. It was suggested that standardization in respect of outputs, forms of enclosures, duty, dimensions and performance characteristics of induction motors, if effected, would result in economic planning of larger installations without delay. There was no gainsaying that standardization was the key for export promotion.

The history of the origin and development of Indian Rail Specifications (generally known as IRS Specifications) was traced by Shri P. R. Ahuja, in his paper 'Development of rail specifications by Indian Standards Institution for internal and export purposes (S-9/13)'. Hitherto, the Indian Railways were formulating their own specifications for rail and railway track materials. With the emergence of many independent countries in Asia and Africa, the demand for Indian rails had increased. The paper also made an interesting comparison between British, American, Russian and Indian Standards on rails which brought out a number of individual interesting features. Shri Ahuja recalled that Bhilai Steel Plant, which had already exported rails to Sudan in the past, could help develop a very good export market for rails. He also suggested that in order to compete with other nations in the international market, Indian Standards on the subject should be popularized in those markets.

Discussion — In the discussion that followed, Shri L. N. Tandon of Tata Engineering and Locomotive Co Ltd, Jamshedpur, suggested that jigs, tools and allied items were some of the important products which had a very good export potential for India. This group of products could be taken up for standardization, quality control and pre-shipment inspection.

Besides the dimensional standardization of items, emphasis was laid on the need for standardization in the presentation of literature. This literature should give all the technical information in an organized and uniform manner to technical personnel.

In regard to the question of formulation of comparative statements by ISI as suggested by Shri V. S. Bhatia, Dr Verman suggested that the committees themselves could initiate this work including the comparative statement as an annexure to Indian Standards.

Chemicals and Ores

Shri M. B. Desai, in his paper 'Role of standardization in export promotion with special reference to chemicals and allied products (S-9/14)', agreed that standardization played an important role in export promotion and that ISI Certification Marks Scheme, a third-party guarantee, would go a long way in creating consumer-confidence besides rendering great help to the producers. He observed that standardization at company level brought rich dividends in the shape of cost reduction and improvement in the quality of goods produced. With the country's trend of changing its pattern of trade, it was imperative that the chemical industry of the country rose to the occasion and supplied quality goods in international markets and thereby earned the reputation for quality.

In his paper 'Export promotion with special reference to promotion of exports of ferro-manganese and manganese ore (S-9/15)', Shri A. Sangameswara Rao touched upon an interesting problem of export promotion of ferro-manganese and manganese ore, potential foreign exchange earners. India had the distinction of being one of the leading suppliers of manganese ore to the world markets. The manganese ore left for various ferro-manganese plants in the country was unsuitable because of its unsatisfactory manganese iron ratio. This had necessitated a greater indigenous consumption of high grade manganese ore resulting in a corresponding fall in the export earnings of the ore. The problem was complicated as both the commodities were potential exchange earners. As a way out, increased use should be made of unmarketable low grade ores by beneficiation and the suitability of high phosphorus ferro-manganese in steel mills investigated. Besides advocating consumption of high phosphorus ferro-manganese in the steel mills of the country, the steel mills in USA (India's main market for ferro-manganese) might also be persuaded to use the same ferro-manganese. ISI, the author suggested could take a lead in this matter.

One of the main factors hindering exports of minerals is the incapacity of numerous exporters to maintain the quality of ores. Stating this, Shri

A. M. Hussain, in his paper 'Standardization of mineral commodities and its impact on their exports from India (S-9/16)', suggested that standardization and pre-shipment inspection were necessary in order to enhance exports and maintain the country's prestige in international markets. Many factors like high mining cost, inefficient transportation, low port handling rates, incapacity of ports to berthing large ore-carriers, stringent mining legislation and fiscal levies were responsible for limited exports of Indian minerals. The inability of Indian exporters to deliver goods on time and as per buyer's specifications was yet another aggravating factor. As a remedy, Shri Hussain suggested working out of 'export grades' of various minerals after careful study of the needs of the consumer in various markets. He also suggested that in some cases like manganese ores, formulation of standards for internal consumption would help in conserving the exportable variety of the ore and thus boost up the exports.

In the paper 'A rapid method of determination of minor quantities of iron in nickel—A tool for quick pre-shipment inspection of goods of commerce (S-9/18)', Shri V. M. Bhuchar detailed the method for the determination of minor quantities of iron in pure nickel, as developed in the National Physical Laboratory. In the assessment of the purity of materials like aluminium, zinc, copper and nickel, and their alloys and salts, determination of small amounts of iron was important. The proposed method was based on direct determination of small quantities of iron in pure nickel from the absorbance of iron oxalate complex at 320 mμ. The method had also been compared with the methods developed by ASTM (thiocyanate method) and the one given in BS specification (nitroso-R-salt method). Because of oxalate method's versatility, reproducibility and suitability of the absorbance values, the authors recommended its adoption for purposes of trade and commerce.

CONCLUDING REMARKS

Shri Manubhai Shah, in his concluding remarks, thanked the delegates for the constructive suggestions they had put forward and assured them that the suggestions would receive due attention. Commenting on the Government's policy of providing the same incentive to all types of industries—small scale, large scale, etc—the Minister said that the main purpose of this scheme was to act as a regulatory measure. There would be justice in as far as the export effort was better diversified towards efficient firms; and it would also avoid continuous discrimination. The Government's incentive policies were modelled after Japanese incentive schemes wherein the incentive was meant to be felt and not seen. The excessive subsidy to the industry by the Government if it was of a physical character would be bad.

Expressing satisfaction over the participation of a large number of delegates in the Session, Shri Manubhai Shah observed that standardization should not be regarded only as a long-term measure for export promotion but also as a tool that yielded immediate returns.

Dr Lal C. Verman proposed a vote of thanks to the Minister for sparing time to preside over the Session despite his busy engagements which showed his keen interest in the activities of the Institution. He also thanked the authors and other delegates for their active contribution and the lively participation in the discussions.

DR RANGANATHAN FELICITATED

■ Dr S. R. Ranganathan, National Research Professor in Library Science, was felicitated recently with the 'Ranganathan Festschrift Vol 1', by the Ranganathan Commemoration Volume Committee and the Mysore Library Association, at Bangalore.

It was in August 1962—on the occasion of Dr Ranganathan's seventy-first birthday—that the librarians of the world joined together to form an International Commemoration Volume Committee to prepare a Festschrift and present it to him in recognition of his manifold services to learning, education, and library science.

The Festschrift Volume, entitled 'Library science to-day', containing 134 papers by 112 authors from 12 countries and four international organizations, was presented to Dr Ranganathan by Dr V. V. Giri, Governor of Mysore. In a message published in the Festschrift, Dr Lal C. Verman, Director ISI, recalls the association of Dr Ranganathan with the Indian Standards Institution, right from 1947, its year of inception, and the valuable contribution made by him to develop standards for documentation and library facilities at national and international levels. The second Volume of the Festschrift, entitled 'An essay in personal bibliography,' is under preparation.

In addition to sponsoring the Festschrift Volumes, the international Committee has also decided to award a Gold Medal in Library Science to perpetuate Dr Ranganathan's work.

Among those who spoke on the occasion and paid glowing tributes to Dr Ranganathan were Shri B. V. Baliga, Speaker of the Mysore Legislative Assembly and President of the Mysore Library Association; Mr B. I. Palmer, a member of the Commemoration Committee and Education Officer of the British Library Association, London; and Shri P. N. Kaula, Secretary of the Commemoration Committee and Professor of Library Science.

Dr S. R. Ranganathan (second from right) *receiving the Festschrift Volume from Dr V. V. Giri, Governor of Mysore as Shri B. V. Baliga, Speaker of the Mysore Legislative Assembly* (left) *applauds. Seated at right is Mr B. I. Palmer of the British Library Association*

STANDARDS NEWS

SISI ORGANIZES OPEN-HOUSE DISCUSSION ON CHEMICAL INDUSTRIES

Lack of facilities for testing and certification marking in accordance with the Indian Standards, lack of technical guidance and proper design of chemical engineering equipment, irregular supply of raw materials were among the subjects of papers presented at the Open-house Discussion on chemical industries which was recently organized by the Small Industries Service Institute (SISI) at its headquarters in Agra. Dr Sadgopal, Deputy Director (Chemicals), ISI, who inaugurated the Discussion, drew attention of the SISI Directorate to the need for drawing up an integrated and co-ordinated programme of developing chemical industries in their region preferably in conformity with relevant Indian Standards issued on various items of the industry.

During discussions, several speakers emphasized the need for some workable arrangement to be set up, by which the small industrial units should be able to get the necessary facilities for testing of their products in accordance with the Indian Standards and also in assisting them in keeping up to the production controls to secure the benefit of ISI Certification Mark. The plastic industry, in particular, emphasized the urgency of this arrangement, as they could not set up their own testing laboratories, although their goods were in no way inferior to similar products being turned out by the organized large-scale industry.

A visit to the Central Footwear Training Centre under the SISI helped to draw attention to the competent technical service being rendered by this important unit in the development of footwear industry on modern lines. The local unit of the STC, set up particularly to assist the footwear industry in turning out the goods of proper design and quality in aid of export promotion, was found to be extremely vigilant and helpful in the matter.

About 50 representatives from various units of small industries within the region of SISI, Agra, participated.

INTERNATIONAL HYDROLOGICAL DECADE National committee set up

Formulation of a national programme towards improvement in the hydrological network, for proper assessment of the country's and global water resources and for maintenance of effective collaboration with the UNESCO Co-ordinating Council are the objects of the National Committee for the International Hydrological Decade which has been announced by the Union Government. The Committee headed by Dr K. R. Ramanathan, consists of 10 specialists from the fields of geophysics, geology, meteorology and irrigation and power. Shri P. R. Ahuja, one of the members of the Committee, has been elected Chairman of the UNESCO Co-ordinating Committee for 1966.

Realizing the need for correct appraisal of water resources to supply basic data for the planning and design of irrigation and flood control projects, the Indian Standards Institution has been working hard to evolve dependable and agreed methods of measurement of flow of water in open channels at the national and international levels. Recently, at the instance of ISI, the International Organization for Standardization also set up a full-fledged Technical Committee 'TC 113 Measurement of Liquid Flow in Open Channels' the secretariat responsibilities of which have been entrusted to India.

QUALITY CONFERENCE 1966

The European Organization for Quality Control (EOQC) will hold its tenth international conference on quality problems in Stockholm next summer. During its 4-day session (6-9 June 1966), the Conference, which is being arranged in co-operation with the American Society for Quality Control (ASQC), will make a penetrating study of the latest experience in the field of quality and reliability. The programme includes lectures and expert discussions split up into three parallel sections as follows:

a) *General Aspects and Methods of Quality and Reliability Assurance*—General aspects of quality and reliability assurance, management understanding of quality and reliability, assurance of quality through use of automatic processes, customer requirements reflected into the control of subcontractors, and quality rating and vendor grading.

b) *Presentation of New Methods or Applications of Quality or Reliability Assurance*—Quality assurance in integrated and in international companies, quality through control of continuous processes, quality and reliability data feed back, various applications of quality and reliability assurance, and quality and reliability specifications and contracts.

c) *Statistical Methods*—Aspects of sampling plans by variables (including life times), new approaches to attribute sampling plans, stochastic processes as

used in quality and reliability, comparison from the quality point of view of manually and automatically controlled processes, and quantities for ultimate evaluation of quality and reliability.

A total of 700 participants are expected, including at least 200 from the United States and a considerable number from Japan.

The Swedish Committee of EOQC, which will host the Conference, has formed a special Conference Board including representatives of industry, branch organizations and Government authorities in Sweden.

REVIEW OF STEEL INDUSTRY'S PROGRESS Seven metallurgists honoured

The need for employing modern methods of production to save wastage in metal consumption and also to utilize metallic wastes to the maximum extent, greater co-ordination between pure and applied research, frequent meetings and consultations among the Indian Institute of Metals, National Metallurgical Laboratory and steel plants and need for ore blending and preparation through various chemical reductions prior to its feeding into the furnaces were among the significant views expressed by the delegates present at the third National Metallurgists Day held recently at Jamshedpur.

Dr Sanjeeva Reddy, Minister of Steel, who inaugurated the celebrations, referred to the 300 percent increase in the country's steel output, and called on the metallurgists and engineers to solve the problems of cutting down the cost of steel production as well as finding out substitutes for certain non-ferrous metals which are in short supply.

Shri Jehangir J. Ghandy, who welcomed the delegates representing the metal industry in both public and private sectors, referred to the problem of heavy operating costs in steel industry, and suggested standardization of products as the right solution to bring down costs. He told the assembly that the Indian Standards Institution had set itself to this task in co-operation with steel producers and consumers. Shri Ghandy felt that the recent technological developments in the country had been limited to aluminium and steel and stressed the need for a wider approach.

Seven outstanding metallurgists, who have been honoured by the Union Ministry of Steel & Mines as the Metallurgists of the year are Dr Arun Kumar Seal, Dr G. V. Paranjpe, Sarvashri Manab Kumar Sen, B. B. Engineer, H. S. Aswath, S. N. Khanna and P. P. Bhatnagar.

Dr G. V. Paranjpe, Shri S. N. Khanna and Shri P. P. Bhatnagar, three of the award recipients are closely connected with ISI's activities. All the three are serving on different technical committees of the Structural and Metals Division of ISI.

PRIORITY FOR PRODUCTION OF NON-FERROUS METALS

A programme consisting of (a) intensive geological survey of areas known to contain non-ferrous metal deposits, (b) stepping up of the production of aluminium, copper and zinc, and (c) production of strategic metals and minerals from small deposits has been formulated by the Union Government. Estimated to cost Rs 2 500 million, the programme will help to increase the indigenous production of these non-ferrous metals by 400 to 500 percent. Increasing the strength of the technical staff of the Geological Survey of India, providing modern mechanical equipment and expansion of the Indian Bureau of Mines are among the many measures contemplated by the Government. In addition to the expansion of the manufacturing facilities of the existing units, the programme envisages setting up of a number of new projects for the manufacture of aluminium, copper and zinc at different centres in the country.

Indian Standards Institution has been well aware of the importance of non-ferrous metals available indigenously, and has formulated a number of specifications with the primary object of utilizing indigenous materials and resources to the maximum extent and helping the import substitution programme. Currently, ISI has also taken up projects in specific fields to revise the existing specifications with a view to substituting or even eliminating the use of scarce materials where possible.

S. S. BHATNAGAR AWARDS Ten scientists honoured

Ten eminent scientists of the country were honoured recently by the Council of Scientific and Industrial Research (CSIR) by conferring on them the Shanti Swarup Bhatnagar Memorial Awards, for their outstanding work in the fields of physical, chemical, biological, engineering and medical sciences. Dr B. D. Tilak (Chemical Sciences) and Dr Brahm Prakash (Engineering Sciences), recipients of the award for 1963, and Dr Sukh Dev (Chemical Sciences), Dr D. S. Athwal (Biological Sciences) and Dr B. R. Nijhawan (Engineering Sciences), recipients for 1964 are all closely connected with ISI's activities as members of the technical committees of the Chemical, Agricultural and Food, Civil Engineering, and Structural and Metals Division Councils. Dr Nijhawan is also the Chairman of the Sectional Committee for Methods of Physical Tests (SMDC 3), and Vice-Chairman of the Structural and Metals Division Council as well as its Standing Working Committee.

W.M. THORNTON MEDAL AWARDED TO DR H. M. GLASS

The Association of Mining, Electrical and Mechanical Engineers (AMEME) presented the 1965 Thornton Medal to Dr H. M. Glass, Technical Director, British Standards Institution who delivered the seventeenth W. M. Thornton Memorial Lecture. Speaking on the subject 'The application of national standards in engineering', Dr Glass gave an excellent exposition of standardization movement in the United Kingdom.

Prof W. M. Thornton, in whose honour the medal and lectures were instituted in 1949, was a professor of electrical engineering at Armstrong College, Durham University and an esteemed past President of AMEME.

INTERIM REPORT OF PATENTS BY ISO/IEC WORKING GROUP

The Joint ISO/IEC Working Group, which was set up to consider a common policy for the two organizations concerning references to patented items in ISO and IEC recommendations met recently at Geneva under the chairmanship of Mr H. A. R. Binney, Director BSI. The interim statement of policy drawn up by the Working Group to help ISO and IEC work includes the following recommendations:

1. There can be no ban on the inclusion of references to patented items in ISO and IEC recommendations, when their inclusion is justified on *technical* grounds. The matter should be considered by technical committees strictly on these technical grounds.

2. The proposer for the inclusion of a reference to a patented item in an ISO or IEC recommendation would be expected to inform the technical committee of any known patent rights and assurances should be secured that the patent holder will be ready to accept its inclusion and to grant licences to

all applicants on reasonable and non-discriminatory terms.

3. The Joint ISO/IEC Working Group on Patents should remain in being and technical committees with problems of this nature should inform the Patents Group. The Group will report as necessary to the ISO Council and the IEC Committee of Action.

EQUITABLE DISTRIBUTION OF THE SECRETARIATES OF ISO TECHNICAL COMMITTEES

The problem of ensuring an equitable distribution of the secretariat responsibilities of technical committees among member countries was considered by the Council of the International Organization for Standardization, at its last meeting. In accordance with the recommendation of the Planning Committee (PLACO), the Council adopted the following resolution (Resolution No. 35, Council 1965) outlining its policy in this matter:

"With a view to a more equitable distribution of technical committee secretariates among the ISO member bodies, as was recommended in Resolution No. 25, Council 1959, the Council decides to adopt the following line of action:

1. When proposing a new subject for study, a member body, if it happens to be one carrying a large share of secretariates, should explore the possibility of suggesting a member body other than itself for the allocation of the secretariat of the new committee, if formed (as, for example, the United Kingdom has done in several cases);
2. Whenever the question of transfer of a secretariat from one member body to another arises, similar consideration should prevail as under (1) above;
3. When a new proposal is sent out for enquiry among member bodies by the General Secretariat, the latter should draw attention to Resolution No. 25, Council 1959, and this particular resolution in the form in which it may ultimately be adopted by the Council;
4. In replying to these enquiries each member body should give due weight to the spirit of these resolutions and not be guided merely by the consideration that he who proposed a new subject must necessarily undertake the burden of the secretariat; and
5. Planning Committee, while considering the replies of member bodies to such enquiries, should not be guided merely by the majority view on the allocation of secretariates of new committees but by the principle of more equitable distribution consistent with the primary consideration of expeditious disposal of work."

INDIAN STANDARDS AMALGAMATED

Two Indian Standards *'IS: 566-1954 Disodium phosphate, dodecahydrate, pharmaceutical, and analytical reagent'* and *'IS: 572-1954 Disodium phosphate, dodecahydrate, technical'* have been revised and amalgamated as *'IS: 566-1965 Disodium phosphate, dodecahydrate'* IS: 572-1954 has, therefore, been withdrawn.

ANNOUNCEMENT

Dr Sadgopal, Deputy Director (Chemicals), ISI has been nominated member of Farm Advisory Committee, constituted by the Central Indian Medicinal Plants Organization, Lucknow, to look into the working of farms under it.

PACKAGING FOR EXPORT AND TECHNIQUES OF INTERNATIONAL MARKETING IIFT organizes seminar and training programme

The Indian Institute of Foreign Trade (IIFT) organized a Seminar on 'Packaging for Exports' last December to examine problems relating to raw materials, research and development of packaging materials, market studies and problems of packaging in the context of export marketing. The major recommendations arising out of the deliberations were as follows:

a) Formation of an association of manufacturers of packages and packaging materials : A three-member committee was set up to prepare a paper on the organization of this association;

b) Appointment of a select committee under the chairmanship of the Director-General of the Indian Institute of Foreign Trade to formulate specific proposals for implementing the project of setting up an Institute of packaging; and

c) Survey of packaging in Japan, USA and ECM countries.

Inaugurating the Seminar, Dr V.K.R.V. Rao, Member, Planning Commission laid stress on the proper training to the personnel concerned with export packaging; research for fuller utilization of Indian raw materials, such as forest products; necessity for overseas marketing research to determine packaging techniques and preferences in markets abroad; and application of Indian motifs to export packages.

Dr Sadgopal and Dr A. K. Bhattacharya, who represented ISI at the Seminar, emphasized the need to adhere to Indian Standard specifications relating to packaging of goods and gave an account of the work accomplished as well as the work in hand with ISI in this direction.

An exhibition organized on the occasion by the Indian Council of Trade Fairs and Exhibitions displayed a good collection of consumer goods cartons, containers and labels to stress the message of visual appeal necessary to sell any product in a competitive market. It also focussed attention on the transit damage and new techniques and materials used for preventing waste of the export goods.

A three-week training course on Techniques of International Marketing for senior executives from export promotion councils, industry and trade, commodity boards, Government trading corporations, public enterprises and officials of the Central and State Governments was conducted recently by the Indian Institute of Foreign Trade (IIFT) in New Delhi. Quality control and pre-shipment problems, shipping procedures, exhibitions and trade fares abroad, export finance and export credit facilities in India were among the subjects covered and the lectures were delivered by people drawn from the various specialized fields. The course was the third in the series organized by IIFT during these two years.

IOM-I's OFFICE EFFICIENCY EXHIBITION—MARCH 1966

The Institute of Office Management India (IOM-I), New Delhi, has planned to organize a 15-day 'Office Efficiency Exhibition' to commence on 12 March 1966. On display will be office equipment, business machinery, furniture and stationery; practical demonstrations and talks and discussions on office efficiency will also form part of the exhibit.

ERRATUM This Journal: V 18, N 1, P 20, Col 3, Para 2

The definition of the term 'oven-dry weight' may please be read as follows:

'The weight of a sample dried to substantially constant weight in an oven maintained at 105°±3°C and supplied with air at the standard temperate atmosphere for testing (65 ±2 percent RH and 20°±2°C) or standard tropical atmosphere for testing (65 ±2 percent RH and 27°±2°C).'

COMMITTEE MONTH

This month, we report the proceedings of 19 committees which held their meetings during 21 October to 20 November 1965. While detailed notes are given regarding some of the committee meetings, the Table of Meetings (see page 106) *gives particulars of all the meetings held during the period.*

EARTHQUAKE ENGINEERING

The task of formulating standards for design and construction of earthquake resistant structures, and for the related investigations, measurements and tests has been taken over by the newly set up Sectional Committee for Earthquake Engineering (BDC 39). Previously the work was being looked after by a subcommittee working under the Functional Requirements of Buildings Sectional Committee (BDC 12) which had formulated the Indian Standard *'IS : 1893-1962 Recommendations for earthquake resistant design of structures'* already in wide use. The standard covered design requirements of buildings as well as of elevated structures, bridges, concrete and masonry dams, embankments and retaining walls after taking into account the tectonic features and geological nature of the ground in various parts of the country, intensity and location of earthquakes that had taken place, and the behaviour of structures subject to earthquake forces.

Presiding over the first meeting of BDC 39 held at Roorkee during 20-21 November 1965, Dr Jai Krishna, Director, School of Research and Training in Earthquake Engineering, University of Roorkee, underlined the significance of work in the field of earthquake engineering in India. Drawing attention to the need for further work to review the design codes and maps as well as to cover constructional features, the Chairman felt that the Committee should take up work on many more civil engineering structures, such as pipe lines, quay walls, etc.

Dr Jai Krishna referred to the developments at the international level particularly to the formation of UNESCO Working Groups on 'Seismology' and 'Earthquake Engineering' in which India would be participating actively. Drawing attention to the need for standardization of investigational procedures, the Chairman suggested that in due course recommendations should be formulated on site investigations for establishing seismic data for a project, laboratory investigations, instrumentation and methods of model analysis for study of dynamic behaviour of structures as well as criteria for such model designs.

The Committee at this meeting took up the revision of *'IS : 1893-1962 Recommendations for earthquake resistant design of structures'* and decided on some modifications in the geological and epicentral maps in view of the additional data now available as well as to improve presentation. With regard to epicentral map, it was decided that magnitudes indicated should be clearly differentiated either by different colours for the circles of different sizes or by different symbols. Cities as shown in the zoning map should also be reproduced in the epicentral map along with additional epicentres located subsequently. The draft revision including these and other modifications effected in the light of comments received was approved for wide circulation.

The Committee decided to undertake long-range investigations for replacing geological map with a soil-cum-geological zoning map, and epicentral map with a basic seismic map showing maximum recorded intensities. The Committee also considered the preliminary draft 'Code of practice for earthquake resistant construction of buildings'. The draft after incorporating the modifications suggested would be taken up at the next meeting for further processing.

CIVIL ENGINEERING DEPARTMENT Progress reviewed by SWCB

Presiding over the thirteenth meeting of the Standing Working Committee of the Civil Engineering Division Council (SWCB) held on 28 October 1965 in New Delhi, Prof M.S. Thacker, Member, Planning Commission, drew attention to the current developments which called for new efforts in standardization, particularly in the context of import substitution. For this

purpose, the Chairman sought the co-operation of the members in their respective spheres of activity and hoped for tangible results to be achieved in the near future. Prof Thacker also referred to the enthusiasm and confidence shared by his colleagues and most technical personnel in the country that, given the time, responsibility and necessary encouragement, the problem of substitution of the imported and scarce materials could be tackled with success.

The Committee noted that in the nine months ending September 1965, 88 sectional committees, subcommittees and panels had held their meetings. As a result, 83 standards were printed (including 29 under print), 44 finalized for publication, 56 issued for wide circulation, and 61 approved for wide circulation.

SWCB reviewed the compositions of 11 sectional committees dealing with concrete, plaster and tiled finishes; doors, windows and shutters; functional requirements in building; construction plant and machinery; timber stores; furniture; fire safety; structural safety; criteria for design of structures; and earthquake engineering.

Shri N.G.K. Murthy, Joint Secretary and Chief Engineer (Irrigation), Maharashtra, was appointed the Chairman of the Dam Sections (Non-Overflow) Sectional Committee (BDC 53). Twentysix new subjects were approved for formulation of Indian Standards.

ALCOHOLIC DRINKS

Inaugurating the first meeting of the Alcoholic Drinks Sectional Committee (AFDC 30) held in New Delhi during 15-16 November 1965, Dr Lal C. Verman, Director ISI stated that notwithstanding the stigma attached to alcoholic drinks in the country, it could not be denied that alcohol was economically important and one of those items which had great potential for export. Since export was the primary need of the day, one had to take good note of such items and put them on an exportable footing. Further, Dr Verman emphasized the point that the standards must be prepared to fit in the existing need of the country so as to help production and promote export trade.

Presiding over the meeting, Col A.G. Fernandes, Deputy Director (Food Inspection), QMG's Branch, Army Headquarters mentioned that the armed forces were one of the biggest consumers of alcoholic drinks. Drawing attention to the proposed draft specifications on the agenda of the meeting, Col Fernandes pointed out that they were prepared on the basis of the ASC Specifications which were based on data collected in the Army Food Laboratory by analysing various samples over a number of years.

A detailed discussion took place in which some representatives of manufacturers were of the opinion that standards for alcoholic drinks should be confined only to limits in respect of harmful ingredients and adulterants so as to guarantee that the products were fit for human consumption. They emphasized that brewing was more of an art than a science and, therefore, chemical constituents of alcoholic drinks should not be prescribed. After an interesting and thorough discussion, the Committee took up the proposed drafts on beer, rum, whisky, gin and brandy for further processing.

The drafts on beer and rum were approved for wide circulation. The drafts on whisky, brandy and gin were entrusted to a subcommittee constituted for the purpose of examining them in detail and processing for wide circulation.

TABLE OF MEETINGS

AGRICULTURAL AND FOOD PRODUCTS DEPARTMENT

AFDC 30 ALCOHOLIC DRINKS — New Delhi, 15-16 November 1965

Chairman Col A. G. Fernandes
Deputy Director (Food Inspection)
Food Inspection Organization
Delhi

Drafts approved for wide circulation—Specifications for (a) Beer, and (b) Rum.

Other activities—The Committee set up a Liquors Subcommittee, AFDC 30 : 1, to process draft specifications for whisky, gin and brandy. The Subcommittee was also authorized to issue the draft standards in wide circulation.
See also column 2 above.

CHEMICAL DEPARTMENT

CDC 8 PAINTS AND ALLIED PRODUCTS — Madras, 16-18 November 1965

Chairman Shri W. E. Norris
Goodlas Nerolac Paints Private Ltd
Bombay

Drafts finalized for publication—Specifications for (a) Mastic cement for bedding of metal windows; (b) RMP, aluminium, brushing, priming, water resistant, for wood work; (c) Phthalocyanine pigments for paints; and (d) Zinc chrome for paints (*second revision of* IS : 51). Methods of sampling and test for drying oils for paints (*revision of* IS : 74).

Drafts approved for wide circulation — Specifications for (a) Knifing stopper, and (b) Ready mixed red oxide alkyd-based paint.

New Subject — Spar varnish.

CDC 11 NATURAL AND SYNTHETIC PERFUMERY MATERIALS — New Delhi, 29 October 1965

Chairman Dr G. S. Hattiangdi
Hindustan Lever Ltd
Bombay

Drafts finalized for publication — Specifications for (a) Camphor, (b) Benzyl acetate, (c) Benzyl alcohol, (d) Amyl salicylate, (e) Eugenol, (f) Methyl cinnamate, (g) *iso*Butyl phenyl acetate, and (h) Styralyl acetate.

Drafts approved for wide circulation — Specifications for (a) Phenyl ethyl alcohol, (b) Vanillin, (c) Coumarin, and (d) *iso*Borneol.

CDC 25 ALKALIS AND CHLORINE — Calcutta, 10-11 November 1965

Chairman (for the meeting) Shri M. L. Seth, General Manager, D.C.M. Chemical Works, New Delhi

Draft finalized for publication — Specification for zinc chloride (*revision of* IS : 701).

Other activities — The Committee gave considerable thought to the comments received from consumers and suppliers on 'IS : 797-1955 Common salt for chemical industries', and 'IS : 1540-1959 Quick lime and hydrated lime for chemical industries' and decided to undertake their revisions to make them more rational.

CEDC 1 LUBRICANTS — Calcutta, 21 October 1965

Chairman (for the meeting) Dr M. L. Khanna, National Physical Laboratory, Hillside Road, New Delhi

Draft finalized for publication — Specification for castor oil (*revision of* IS : 435).

Drafts approved for wide circulation — Specifications for (a) Cutting oil, sulphurized and non-sulphurized, for non-ferrous metals; (b) Grease, S. No. 3 (*revision of* IS : 409); (c) Grease S, hard loco (*revision of* IS : 720); (d) Lubricating oils for refrigeration machinery; (e) Marquenching oils; (f) Multipurpose grease, No. 1, No. 2 and No. 3 (*revision of* IS : 1002); and (g) Open gear and wire rope lubricants.

New subjects — Corrosion inhibitors for cooling system of vehicles, guide for selection of temporary corrosion protectives, volatile corrosion inhibitor coated papers, and volatile corrosion inhibitor powders.

CIVIL ENGINEERING DEPARTMENT

STANDING WORKING COMMITTEE CIVIL ENGINEERING (SWCB) — New Delhi, 28 October 1965

Chairman Prof M. S. Thacker, Member Planning Commission, New Delhi

Business Transacted — See page 105.

BDC 28 CONSTRUCTION PLANT AND MACHINERY — New Delhi, 29 October 1965

Chairman Maj-Gen R. A. Loomba, Director General, Border Roads, Army Headquarters, New Delhi

Drafts finalized for publication — Specifications for (a) Floor polishing machines, (b) Pan vibrators, (c) Pneumatic concrete breakers, and (d) Asphalt paver finisher.

Drafts approved for wide circulation — Specification for shutter vibrators for concrete.

BDC 39 EARTHQUAKE ENGINEERING — Roorkee, 20-21 November 1965

Chairman Dr Jai Krishna, Director, School of Research and Training in Earthquake Engineering, University of Roorkee, Roorkee

Business Transacted — See page 105.

ELECTROTECHNICAL DEPARTMENT

ETDC 9 MICA — Giridih, 8 November 1965

Chairman Shri C. M. Rajgarhia, Federation of Mica Associations of Bihar, Giridih

Business transacted — The Committee considered the draft minutes of the 5th meeting of ISO/TC 56 Mica held in New York from 28 June to 1 July 1965 and the resulting draft specifications on 'Visual classification of muscovite mica blocks, thins and films' and on 'Muscovite mica splittings'. The Committee agreed to make detailed comments on the two drafts at a later date. However, in regard to the specification for six grades of loose splittings, the Committee decided to propose to TC 56 that this should be taken up by the Working Group already set up in New York meeting which should ascertain the appropriate specification limits by actual analysis from the supplies made.

ETDC 37 ELECTROMECHANICAL COMPONENTS FOR ELECTRONIC EQUIPMENT — Bangalore, 10-11 November 1965

Chairman Brig B. M. Chakravarti, Director, Electronics Radar & Development Establishment, Bangalore

Draft finalized for publication — General requirements and tests for tag strips.

Drafts approved for wide circulation — Connectors for low frequencies below 3 Mc/s: Part 1 General requirements and tests. Dimensions for polarized plugs for hearing aids.

New subjects — General requirements and tests for push button switches for electronic and telecommunication equipment, and telescopic aerials for broadcast receiver.

MECHANICAL ENGINEERING DEPARTMENT

EDC 26 BICYCLES — Bombay, 29 October 1965

Chairman Shri Abhijit Sen, Messrs Sen-Raleigh Ltd, Calcutta

Drafts finalized for publication — Glossary of terms used in bicycle industry. Specification for ladies bicycle frames.

Other activities — A new Subcommittee 'Moped Components and Accessories Subcommittee, EDC 26 : 4' was set up. The Committee also recommended publication of Amendment No. 2 to 'IS : 630-1961 Bicycle spokes (plain) and nipples for spokes (*revised*)' without any circulation.

New subjects — Pedals for mopeds, cranks for mopeds, chains for mopeds, chain wheels for mopeds, spokes for mopeds, rims for mopeds, and method of sampling for bicycle components.

STRUCTURAL AND METALS DEPARTMENT

SMDC 14 WELDING GENERAL — New Delhi, 11 November 1965

Chairman Shri R. Ghosh
Indian Oxygen Ltd
Calcutta

Drafts finalized for publication — Acceptance tests for wire flux combinations for submerged arc welding. Classification and coding of covered electrodes for metal arc welding of mild steel and low alloy high tensile steels (*revision of* IS : 815). Codes of practice for (a) Testing of fusion welded joints and weld metal in steel, and (b) Training and testing of metal arc welders (*revision of* IS : 817).

Drafts approved for wide circulation — Codes of practice for (a) Inspection of welds, and (b) Safety and health requirements in electric and gas welding and cutting operations (*revision of* IS : 818). Procedure code for submerged arc welding. Qualifying tests for metal arc welders (engaged in welding structure other than pipes) (*revision of* IS : 1181). Specification for filler rods and wires for gas welding (*revision of* IS : 1278).

New subjects — Code of practice for welding of plastics, covered electrodes for stainless steel, glossary of terms relating to welding of plastics, and testing of steel for assessment of butt and fillet welds similar to DIN 50127.

SMDC 15 STRUCTURAL WELDING — New Delhi, 12 November 1965

Chairman (for the meeting) Shri N. V. Pandit
Deputy Director Research (Met)
Research, Designs & Standards Organization
Chittaranjan

Drafts finalized for publication — Codes of practice for (a) Oxy-acetylene welding for structural work in mild steel (*revision of* IS : 1323), and (b) Use of metal arc welding for hull construction of merchant ships in mild steel. Code for welding of mild steel bars used for reinforced concrete construction.

SMDC 21 STEEL FORGINGS — New Delhi, 29 October 1965

Chairman (for the meeting) Dr K. B. Mehta
Deputy General Manager
Heavy Engineering Corporation
Ranchi

Drafts finalized for publication — General requirements for steel drop, upset and press forgings. Specification for forged steel rolls.

Drafts approved for wide circulation — Specifications for (a) Alloy steel billets, blooms and slabs for forgings; and (b) Carbon steel billets, blooms and slabs for forgings (*revision of* IS : 1875).

Other activities — The Committee considered in detail the question of formulation of war emergency standards, reduction of varieties and relaxation of some of the requirements where appropriate, for forgings for defence requirements. It was felt that the specific components for which the war emergency standards were required to be formulated and also the end uses of such components should be made available to the Committee and the work taken up on top priority basis.

TEXTILE DEPARTMENT

TDC 1 TEXTILE STANDARDS — Bombay, 16 November 1965

Chairman Dr R. L. N. Iyengar
Indian Central Cotton Committee
Bombay

Drafts finalized for publication — Methods for determination of (a) Count of yarn removed from fabrics, and (b) Wool fibre diameter—projection microscope method (*revision of* IS : 744).

Drafts approved for wide circulation — Conversion factors and conversion tables for yarn counts. Glossary of textile terms—natural fibres (*revision of* IS : 232). Methods for determination of (a) Micronaire value of cotton fibres, and (b) Strength of cotton fibres: Flat bundle method.

TDC 3 JUTE AND JUTE PRODUCTS — Calcutta, 21 October 1965

Chairman Shri G. C. L. Joneja
Jute Commissioner
Calcutta

Draft finalized for publication — Specification for jute bags for packing cement (*revision of* IS : 2580).

Drafts approved for wide circulation — Specifications for (a) Heavy cee jute cloth, (b) Jute corn sack cloth, and (c) B-twill jute cloth.

New subject — Packaging of jute products in rolls.

Other activities — The draft 'Specification for packaging of jute products' finalized on 30 January 1965, had been withheld from publication in order to afford opportunity to the American Burlap and Trade Deputation which visited India during March 1965 for perusal and comments. Based on the views expressed by the Deputation, Indian Jute Mills Association in this meeting put forth a modified draft. The Committee reconsidered the draft and approved it for publication with some modifications.

TDC 5 TEXTILE CHEMISTRY — Bombay, 21 October 1965

Chairman Dr P. C. Mehta
Director
Ahmedabad Textile Industry's Research Association
Ahmedabad

Drafts finalized for publication — Methods for (a) Determination of solubility of wool in alkali; (b) Determination of

solubility of wool in urea-bisulphite solution; (c) Estimation of common antiseptics used in textile industry; (d) Determination of colour fastness of textile materials to washing: Test 2; (e) Determination of colour fastness of textile materials to washing: Test 4 (*revision of* IS : 765); (f) Determination of colour fastness of textile materials to acid felting: Severe; (g) Determination of colour fastness of textile materials to washing: Test 5; (h) Determination of colour fastness of textile materials to rubbing with organic solvents; (j) Quantitative chemical analysis of mixtures of polyester fibres with cotton or regenerated cellulose; and (k) Quantitative chemical analysis of binary mixtures of acrylic and certain other fibres.

Drafts approved for wide circulation — Methods for (a) Identification of textile fibres (*revision of* IS : 667), (b) Determination of dimensional changes on washing of woven silk fabrics, (c) Determination of water soluble matter of textile materials, and (d) Testing flax fabrics for resistance to attack by micro-organisms.

TDC 19 TEXTILE MILL ACCESSORIES (OTHER THAN JUTE) — Kalol (Gujarat), 30 October 1965

Chairman Shri B. R. Ramaswamy
Ahmedabad Textile Industry's Research Association
Ahmedabad

Draft finalized for publication — Specification for dobby lags and pegs.

Draft approved for wide circulation — Specification for flyer bobbins.

Other activities — The Committee decided to dissolve the Subcommittee for ISO Work on Textile Mill Accessories (TDC 19 : 4) as it was felt that India's views on ISO documents should better be formulated by TDC 19 itself.

TDC 33 SAMPLING METHODS — Bombay, 11 November 1965

Chairman Dr (Miss) S. P. Vaswani
N. C. Corporation Pvt Ltd Bombay

Drafts approved for wide circulation — Methods for (a) Sampling cotton yarn for determination of physical characteristics, (b) Sampling cotton fabrics for determination of physical characteristics, and (c) Determination of sample-size to estimate the average quality of a lot or a process.

Other activities — The Committee decided to set up a Panel on Sampling of Cotton Textiles, TDC 33/P-2 to expedite the collection of data and formulation of sampling procedure for cotton textiles.

GET-TOGETHER OF RESEARCH AND INDUSTRY

■ A two-day Get-Together of Research and Industry organized by the Council of Scientific & Industrial Research (CSIR) during December 1965 at New Delhi went a long way towards exploring avenues for closer collaboration between research laboratories and industry in the country. It also pinpointed areas of major shortages of materials and equipment and the steps that could be taken for achieving self-reliance.

Inaugurating the Conference, Shri M. C. Chagla, Union Minister of Education, said that young research workers should be given a fair chance to face the new demands of industry which should give up the unhealthy tendency to depend always on foreign aid and know-how in industrial research and technology. Shri Chagla underlined the need for evolving substitutes for imported raw materials and for encouraging indigenous production of machinery components. Research must be directed towards reduction of cost and improvement of quality and all out efforts must be made to fully utilize the installed capacity of new and old plants. Shri Chagla wanted the public sector undertakings to give a lead in this matter.

Dr T. N. Singh, Union Minister of Industry; Shri K. S. Raghuramiah, Deputy Minister of Industry; Shri Asoka Mehta, Deputy Chairman of the Planning Commission; and Dr S. Husain Zaheer, Director-General, CSIR also addressed the inaugural session. Dr Singh drew attention to the problem of utilizing the industrial capacity to the full in view of the import cuts forced by the scarcity of foreign exchange. Exhorting the scientists and industrialists to recapture the spirit of '*Swadeshi*', Dr Singh desired that the processes developed in national laboratories should get off the ground quickly enough for commercial exploitation.

Over nine hundred scientists, engineers, technologists and industrialists participated in the 15 working groups of the Conference for detailed discussions on electrical and electronics, chemicals, pharmaceuticals, machinery and equipment, food and agriculture, metallurgy, textiles, petroleum, energy and coal, glass and ceramics, aviation, civil engineering, etc. Among the papers presented for discussion at the working groups, two were from ISI: 'Some of the problems met with in laying down Indian Standard specifications for agricultural and food products' by Shri E. N. Sundar, and 'Import substitution and conservation of scarce materials—scope for research and standardization' by Shri Gurcharan Singh.

The major recommendations of the various working groups related to the conservation and substitution of scarce materials, speeding up of production of copper and alloy steels by the public sector projects already in hand, ban on import of goods like dyes except for defence and exportable goods, incentive for manufacturers using indigenous know-how and rewards for organizations bringing about a substantial saving in foreign exchange. It was generally felt that investment on research was very much lower than what the state of the economy or the present crisis demanded and it was recommended that 5 percent of the annual turnover of industry should be earmarked for research. A thorough survey of the country's mineral wealth to fill the existing gaps in ferrous and non-ferrous metals and compilation of a directory of technical information were among the long-term measures recommended.

Standardization figured prominently in the discussions and it was pointed out that standardization of instruments and components would help to avoid multiplicity of models. It was urged that research institutions, engineering firms, user industries, trade associations and ISI should speedily develop Indian Standards for spares, components and raw materials to accelerate industrial development and utilization of indigenous raw materials. Common acceptance of standards would not only be a major factor in introducing indigenous products, raw materials and know-how, but would also play a notable role in building a reputation for Indian products equivalent to that enjoyed by foreign trade names.

CERTIFICATION MARKS

During November 1965, the Institution specified standard mark and prescribed marking fee for one product. Standard mark for one product was revised. Besides, 7 new licences were granted and another 180 renewed. Particulars of all these and of licences lapsed or renewal deferred are given in the tables which follow.

STANDARD MARK AND MARKING FEE

DESIGN OF THE STANDARD MARK	PRODUCT/CLASS OF PRODUCT AND THE NUMBER OF THE RELEVANT INDIAN STANDARD	UNIT	MARKING FEE PER UNIT	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE	
				S. O. No. and Date	*Gazette Issue Dated*
	Malathion dusting powders —IS : 2568-1963	One metric tonne	Rs 5·00	3655 & 3657 15-11-1965	27-11-1965

STANDARD MARK REVISED

DESIGN OF THE STANDARD MARK	PRODUCT/CLASS OF PRODUCT AND THE NUMBER OF THE RELEVANT INDIAN STANDARD	UNIT	MARKING FEE PER UNIT	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE	
				S.O. No. and Date	*Gazette Issue Dated*
	*Maida* — IS : 1009-1957	—	—	3656 15-11-1965	27-11-1965

[See ISI Bull; V 13, N 4, P 185 (1961) for the design of the standard mark (Grade I) as first specified, unit and rate of marking fee.]

NEW LICENCES GRANTED

(Published in the Gazette of India, Part II, Section 3(ii), dated 1-1-1966 under Notification Number S.O. 61, dated 20-12-1965)

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY *From*	*To*	NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
CM/L-1161 2-11-1965	16-11-1965	15-11-1966	Madhya Pradesh Iron and Steel Works Private Ltd., Nandini Road, Bhilai (M.P.)	Structural steel (standard quality) — IS : 226-1962
CM/L-1162 4-11-1965	1-1-1966	31-12-1966	Prem Cables Private Ltd., P.O. Pipalia-Kalan, Via Raipur-Marwar, Distt. Pali (Rajasthan)	Hard-drawn stranded aluminium and steelcored aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-1163 4-11-1965	16-11-1965	15-11-1966	The Leeds Meter Mfg. Company Ltd., Mathuradas Mills Compound, Delisle Road, Lower Parel, Bombay	Water meters (domestic type), 15 mm size — IS : 779-1965 (Leeds Brand)
CM/L-1164 8-11-1965	16-11-1965	15-11-1966	Apeejay Steel Casting Co. Private Ltd., Netaji Subhash Road, Jullundur (Punjab)	Carbon steel billets for re-rolling into structural steel (standard quality) — IS : 2830-1964
CM/L-1165 8-11-1965	16-11-1965	15-11-1966	do	Carbon steel billets for re-rolling into structural steel (ordinary quality) — IS : 2831-1964
CM/L-1166 11-11-1965	16-11-1965	15-11-1966	Swastika Metal Works, Jagadhri (Punjab)	Rolled brass sheet and strip, Grade BS63 — IS : 410-1959 (Swastika Brand)
CM/L-1167 23-11-1965	1-12-1965	30-11-1966	The Indian Iron & Steel Co. Ltd., Burnpur Works, P.O. Burnpur, Distt. Burdwan (West Bengal)	Mild steel and medium tensile bars and hard-drawn steel wire for concrete reinforcement — IS : 432-1960

LICENCES RENEWED

(Published in the Gazette of India, Part II, Section 3(ii), dated 1-1-1966 under Notification Number S.O. 61, dated 20-12-1965)

NO. OF LICENCE AND DATE OF ISSUE	PERIOD OF VALIDITY From	To	NAME AND ADDRESS OF THE LICENSEE	ARTICLE/PROCESS COVERED BY THE LICENCE AND NUMBER OF THE RELEVANT INDIAN STANDARD
CM/L-21 3-12-1956	1-12-1965	30-11-1966	Devidayal Metal Industries, Tulsiram Gupta Mills Estate, Darukhana, Reay Road, Bombay	Wrought aluminium and aluminium alloy sheets, strips and circles — IS : 21-1959
CM/L-34 4-11-1957	16-11-1965	15-11-1966	The National Insulated Cable Co. of India Ltd., Shamnagar, 24 Parganas (West Bengal)	Hard-drawn copper solid and stranded conductors — IS : 282-1963
CM/L-36 4-11-1957	16-11-1965	15-11-1966	do	Hard-drawn stranded aluminium and steel-cored aluminium conductors for overhead power transmission purposes — IS : 398-1961
CM/L-37 4-11-1957	16-11-1965	15-11-1966	do	Rubber-insulated cables and flexible cords of all types and sizes — IS : 434 (Parts I & II)-1964
CM/L-38 4-11-1957	16-11-1965	15-11-1966	do	Cotton covered round copper conductors — IS : 450-1964
CM/L-39 4-11-1957	16-11-1965	15-11-1966	Rashtriya Metal Industries Ltd., Kurla Rd., Andheri (East), Bombay	Wrought aluminium and aluminium alloy utensils — IS : 21-1959
CM/L-40 4-11-1957	16-11-1965	15-11-1966	do	Wrought aluminium and aluminium alloy sheets, strips and circles — IS : 21-1959
CM/L-66 7-2-1958	1-12-1965	31-5-1966	Woodcrafts Assam, Prop: Jay Shree Tea & Industries Ltd., P.O. Mariani, Distt. Sibsagar (Assam)	Tea-chest plywood panels — IS : 10-1953
CM/L-105 31-10-1958	17-11-1965	15-11-1966	Sylvan Plywood Mills, Kallettumkara P.O., Irinjalakadu Rly Station, Distt. Trichur (Kerala)	Tea-chest plywood panels — IS : 10-1953
CM/L-106 4-11-1958	16-11-1965	15-11-1966	The Mysore Chemical Manufacturers Ltd., Chikbanavar P.O., Distt. Bangalore	Copper sulphate, technical — IS : 261-1950
CM/L-107 4-11-1958	17-11-1965	15-11-1966	Assam Veneer & Saw Mills Ltd., 9 Clive Row, Calcutta	Tea-chest plywood panels — IS : 10-1953
CM/L-109 4-11-1958	16-11-1965	15-11-1966	Savlar Paint & Varnish Works, Vihar Lake Road, Saki Naka, Kurla, Bombay	1) Oil paste for paints to Indian Standard colours — IS : 92-1950 and IS : 93-1950 (Navy Brand) 2) Oil paste for paints, zinc oxide — IS : 98-1950 (Navy Brand) 3) Oil paste for paints, zinc oxide, reduced — IS : 99-1950 (Navy Brand)
CM/L-123 21-5-1959	1-12-1965	30-11-1966	Purshotham Goculdas Plywood Co., Cannanore (Kerala)	Tea-chest plywood panels — IS : 10-1953
CM/L-199 15-6-1960	10-11-1965	31-10-1966	Bharat Pulverising Mills Private Ltd., 589 Thiruvottiyur High Road, Madras	BHC water dispersible powder concentrates — IS : 562-1962
CM/L-243 23-11-1960	1-12-1965	30-11-1966	Hindustan Tin Works Private Ltd., G.T. Road, Ghaziabad	18-litre square tins — IS : 916-1958
CM/L-302 25-5-1961	1-12-1965	30-11-1966	National Plywood Industries, 6 Gorapada Sarkar Lane (Daspara), Calcutta	Tea-chest plywood panels — IS : 10-1953
CM/L-351 31-10-1961	17-11-1965	15-11-1966	Bharat Wood Works Private Ltd., P.O. Dibrugarh, Assam	do
CM/L-352 31-10-1961	16-11-1965	15-11-1966	Devidayal Cable Industries Private Ltd., Gupta Mills Estate, Darukhana, Reay Road, Bombay	PVC cables, 250/440 and 650/1 100 volts grade — IS : 694 (Parts I & II)-1964
CM/L-358 20-11-1961	1-12-1965	30-11-1966	Indian Traders Private Ltd., Industrial Area, Najafgarh Road, New Delhi	VIR copper or aluminium cables for fixed wiring: i) Tough rubber sheathed 250/440 volts ii) Braided and compounded 250/440 volts and 650/1 100 volts iii) Weatherproof 250/440 volts and 650/1 100 volts — IS : 434 (Parts I & II)-1964

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CM/L-359 20-11-1961	1-12-1965	30-11-1966	Burmah-Shell Oil Storage & Distributing Co. of India Ltd., Burmah-Shell House, Ballard Estate, Bombay	Dieldrin emulsifiable concentrates — IS : 1054-1962
CM/L-385 14-2-1962	16-11-1965	15-5-1966	Assam Saw Mills & Timber Co. Ltd., Jalan House, 62 Ballygunge Circular Road, Calcutta	Tea-chest plywood panels — IS : 10-1953
CM/L-464 24-10-1962	16-11-1965	15-11-1966	Geo Industries & Insecticides (India) Private Ltd., Field No. 82/3(a) Sathankadu, Kaladipet, Madras	BHC water dispersible powder concentrates — IS : 562-1962
CM/L-465 30-12-1962	1-12-1965	30-11-1966	E.A.G. Minerals Supply, B/1 Hide Road, Kidderpore, Calcutta	BHC dusting powders — IS : 561-1962
CM/L-467 30-10-1962	16-11-1965	15-11-1966	Shalimar Tar Products (1935) Limited, 26 Lake Road, Bhandup, Bombay	Bitumen felts for waterproofing and damp-proofing, Type 3, Grades 1 and 2 — IS : 1322-1959
CM/L-468 30-10-1962	16-11-1965	15-11-1966	Prabhat Udyog Ltd., Prabhat Udyog Nagar, Ghodbunder Road, Jogeshwari, Bombay	Oil pressure lanterns — IS : 1384-1964
CM/L-471 2-11-1962	16-11-1965	15-11-1966	do	Blow lamps — IS : 1899-1961
CM/L-472 16-11-1962	1-12-1965	30-11-1966	Bharat Sheet Metal Industries Ltd., 22 Beerpara Lane, Ghugudanga, Dum Dum, Calcutta	Steel drums of Grade B2 only — IS : 2552-1963 (BSM Brand)
CM/L-473 20-11-1962	1-12-1965	30-11-1966	Chandra Electricals, S2/638 Club Road, Varanasi Cantt.	AC & universal fractional horse power motors, $\frac{1}{30}$ hp to 1 hp only — IS : 996-1959
CM/L-564 19-7-1963	1-12-1965	30-11-1966	Associated Tube Wells (India) Pvt. Ltd., Modinagar (U.P.)	Flushing cisterns for water closets and urinals (valveless siphonic type) high level — IS : 774-1960
CM/L-567 26-7-1963	1-12-1965	30-11-1966	Vansal & Vansal, 105/696 Kalpi Road, Kanpur	Fractional horse power electric motors, $\frac{1}{30}$ hp and $\frac{1}{40}$ hp — IS : 996-1959
CM/L-583 24-9-1963	1-12-1965	30-11-1966	The Standard Flour & Oil Mills Private Ltd., Ganj Basoda (M.P.)	*Maida*, grade high gluten — IS : 1009-1957
CM/L-589 14-10-1963	16-11-1965	15-11-1966	P.V.C. Wires & Cables Pvt. Ltd., 1 Ishan Ghosh Road, Calcutta	PVC insulated cables only, 250 and 650 volts grade with copper conductors only — IS : 694 (Parts I & II) = 1964
CM/L-591 21-10-1963	16-11-1965	15-11-1966	Shalimar Tar Products (1935) Ltd., 26 Lake Road, Bhandup, Bombay	Bitumen (plastic) for waterproofing purposes — IS : 1580-1960
CM/L-592 21-10-1963	16-11-1965	15-11-1966	do	Preformed fillers for expansion joint in concrete non-extruding and resilient type (bitumen — impregnated fibre) — IS : 1838-1961
CM/L-593 28-10-1963	16-11-1965	15-11-1966	The Metal Box Company of India Limited, Jeppo, Mangalore	18-litre square tins — IS : 916-1958 ('MB' Brand)
CM/L-595 30-10-1963	1-12-1965	30-11-1966	Pesticides India, Udaisagar Road, Udaipur	Endrin emulsifiable concentrates — IS : 1310-1958
CM/L-597 31-10-1963	1-12-1965	30-11-1966	Camlin Private Limited, Kondivata, Near Marol Bazar, Andheri-Kurla Road, Bombay	Ink, drawing, waterproof, black — IS : 789-1955
CM/L-762 21-8-1964	16-11-1965	15-11-1966	Zenith Fire Services, 28 Parel Tank Road, Ambewadi, Bombay	i) Portable chemical fire extinguisher, foam type — IS : 933-1959 ii) Portable chemical fire extinguisher, soda acid type — IS : 934-1960
CM/L-802 23-10-1964	16-11-1965	15-11-1966	K. L. Malhotra Brothers, WX-83 Basti Nau, Jullundur City	Badminton racket frames, super and special grades of following brands: i) Viking malbro, fitted with steel shaft ii) Viking malbro, fitted with wooden shaft (champion model) iii) The rock, fitted with steel shaft — IS : 831-1957

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CM/L-805 26-10-1964	1-11-1965	31-10-1966	Steel Rolling Mills of Hindustan Private Ltd., 47 Hide Road Extension, Calcutta	Structural steel (standard quality) of the following sections only: i) MS rounds up to 16 mm dia and over 28 mm dia ii) MS squares up to 14 mm sq and over 28 mm sq iii) MS angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 226-1962
CM/L-806 26-10-1964	1-11-1965	31-10-1966	do	Structural steel (ordinary quality) of the following sections only: i) MS rounds up to 16 mm dia and over 28 mm dia ii) MS squares up to 14 mm sq and over 28 mm sq iii) MS angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 1977-1962
CM/L-809 26-10-1964	1-11-1965	31-10-1966	Aeron Steel Rolling Mills, Jullundur City	Structural steel (standard quality) — IS : 226-1962
CM/L-810 26-10-1964	1-11-1965	31-10-1966	do	Structural steel (ordinary quality) — IS : 1977-1962
CM/L-811 26-10-1964	1-11-1965	31-10-1966	J. K. Iron & Steel Co. Ltd., Kalpi Road, Kanpur	Structural steel (standard quality) of the following sections only: i) MS rounds up to 16 mm dia and over 28 mm dia ii) MS squares up to 14 mm sq and over 28 mm sq iii) MS angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 226-1962
CM/L-812 26-10-1964	16-11-1965	15-11-1966	The Malamine & Fibre Boards Ltd., Dr. Ambedkar Road, Kalol (North Gujarat)	Decorative thermosetting synthetic resin bonded laminated sheet, Grade D2 — IS : 2046-1962
CM/L-813 26-10-1964	16-11-1965	15-11-1966	Dharampur Leather Cloth Co. Private Limited, Dharampur, Distt. Surat	Vinyl coated fabric (leather cloth) Grades 1, 2 and 4 — IS : 1259-1958
CM/L-816 30-10-1964	16-11-1965	15-11-1966	Poni Sago Factory, Gwalior Road, Salem	Sago (*saboodana*) — IS : 899-1956
CM/L-818 30-10-1964	16-11-1965	15-11-1966	Sri Natraja & Co., Annanthanapatty, Sankagri Road, Shevapet, Salem	do
CM/L-820 30-10-1964	16-11-1965	15-11-1966	Balakrishna Rice & Sago Factory, Burrial Ground Road, Shevapet, Salem	do
CM/L-821 30-10-1964	16-11-1965	15-11-1966	Sreedhar Sago Factory, 81 Omalur Road, Salem	do
CM/L-822 30-10-1964	16-11-1965	15-11-1966	Saraswati Rice & Sago Factory, Cuddalore Main Road, Attur, Salem	do
CM/L-823 2-11-1964	16-11-1965	15-11-1966	Swadeshi Industries Ltd., 33 Netaji Subhas Road, Calcutta	Structural steel (standard quality) for sections below 14 mm dia or square and other sections of equivalent area — IS : 226-1962
CM/L-824 2-11-1964	16-11-1965	15-11-1966	do	Structural steel (ordinary quality) for sections below 14 mm dia or square and other sections of equivalent area — IS : 1977-1962
CM/L-827 2-11-1964	16-11-1965	15-11-1966	Jindal Steel Works, Malerkotla (Punjab)	Structural steel (standard quality) — IS : 226-1962
CM/L-828 2-11-1964	16-11-1965	15-11-1966	do	Structural steel (ordinary quality) — IS : 1977-1962

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CM/L-831 2-11-1964	16-11-1965	15-11-1966	Aggarwal Hardware Works Pvt. Ltd., 167 Chittaranjan Avenue, Calcutta	Structural steel (standard quality), tested steel rounds up to 1″ (25 mm) dia and flats up to 1″ × ¼″ to 2″ × ½″ (25 mm × 6 mm to 50 mm × 12·7 mm) and sections of equivalent area — IS : 226-1962
CM/L-832 2-11-1964	16-11-1965	15-11-1966	do	Structural steel (ordinary quality), tested steel rounds up to 1″ (25 mm) dia and flats up to 1″ × ¼″ to 2″ × ½″ (25mm × 6 mm to 50 mm × 12·7 mm) and sections of equivalent area — IS : 1977-1962
CM/L-833 6-11-1964	16-11-1965	15-11-1966	The Kandivli Metal Works, Chittabhai Patel Road, Kandivli (East), Bombay	Wrought aluminium and aluminium alloy utensils — IS : 21-1959
CM/L-835 10-11-1964	16-11-1965	15-11-1966	The Hindustan Iron & Steel Co., 8 Rajendra Deb Road, Calcutta	Structural steel (standard quality) of the following sections only: i) MS rounds up to 16 mm dia and over 28 mm dia — IS : 226-1962 ii) MS squares up to 14 mm sq and over 28 mm sq — IS : 226-1962 iii) MS angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 226-1962
CM/L-836 10-11-1964	16-11-1965	15-11-1966	do	Structural steel (ordinary quality) of the following sections only: i) MS rounds up to 16 mm dia and over 28 mm dia — IS : 1977-1962 ii) MS squares up to 14 mm sq and over 28 mm sq — IS : 1977-1962 iii) MS angles, flats, etc, where the cross-sectional area of the sample does not exceed 200 sq mm — IS : 1977-1962
CM/L-839 23-11-1964	1-12-1965	30-11-1966	Industrial Research Corporation, 2/70 East Mada Street, Thiruvannuyur, Madras	Dye-based fountain pen ink (blue, green, red and violet) — IS : 1221-1957
CM/L-842 28-11-1964	1-12-1965	30-11-1966	Bengal Jute Mills Co. Ltd., 493 G.T. Road (North), Shibpur, Howrah	Jute hessian — IS : 2818-1964
CM/L-843 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-844 28-11-1964	1-12-1965	30-11-1966	Barnagore Jute Factory Co. Ltd., 284 Maharaja Nandakumar Road, Alambazar, Calcutta	Jute hessian — IS : 2818-1964
CM/L-845 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-846 28-11-1964	1-12-1965	30-11-1966	Kanknarrah Co. Ltd., 1 Clark Ghat Road, Bhatpara, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-847 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-848 28-11-1964	1-12-1965	30-11-1966	Kamarhatty Co. Ltd., 907 Graham Road, Kamarhatty, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-849 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-850 28-11-1964	1-12-1965	30-11-1966	Howrah Mills Co. Ltd., 493/C/A, G.T. Road, South Howrah	Jute hessian — IS : 2818-1964
CM/L-851 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-852 28-11-1964	1-12-1965	30-11-1966	Budge Budge Jute Mills Co. Ltd., 57 Maulana Azad Road, Budge Budge, Calcutta	Jute hessian — IS : 2818-1964
CM/L-853 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-854 28-11-1964	1-12-1965	30-11-1966	Delta Jute Mills Co. Ltd., Manikpore, Sankrail, Howrah	Jute hessian — IS : 2818-1964
CM/L-855 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

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CM/L-856 28-11-1964	1-12-1965	30-11-1966	Cheviot Jute Mills Co. Ltd., Badekalinagar, Budge Budge, Calcutta	Jute hessian — IS : 2818-1964
CM/L-857 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-858 28-11-1964	1-12-1965	30-11-1966	Auckland Jute Co. Ltd., Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-859 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-860 28-11-1964	1-12-1965	30-11-1966	The Dalhousie Jute Co. Ltd., Champdany, Distt. Hooghly	Jute hessian — IS : 2818-1964
CM/L-861 28-11-1964	1-12-1965	30-11-1966	The Kinnison Jute Mills Co. Ltd., Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-862 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-863 28-11-1964	1-12-1965	30-11-1966	The Lansdowne Jute Co. Ltd., Champdany, Distt. Hooghly	Jute hessian — IS : 2818-1964
CM/L-864 28-11-1964	1-12-1965	30-11-1966	Lawrence Jute Co. Ltd., Chartered Bank Building, Calcutta-1	Jute hessian — IS : 2818-1964
CM/L-865 28-11-1964	1-12-1965	30-11-1966	The Northbrook Jute Co. Ltd., Champdany, Distt. Hooghly	Jute hessian — IS : 2818-1964
CM/L-866 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-867 28-11-1964	1-12-1965	30-11-1966	The Standard Jute Co. Ltd., Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-868 28-11-1964	1-12-1965	30-11-1966	Union Jute Co. Ltd., 12 Convent Lane, Calcutta-15	do
CM/L-869 28-11-1964	1-12-1965	30-11-1966	The Gourepore Co. Ltd., Garifa, 24 Parganas	do
CM/L-870 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-871 28-11-1964	1-12-1965	30-11-1966	The Nuddea Mills Co. Ltd., Naihati, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-872 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-873 28-11-1964	1-12-1965	30-11-1966	National Co. Ltd., Rajgung, Andul, Howrah	Jute hessian — IS : 2818-1964
CM/L-874 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-875 28-11-1964	1-12-1965	30-11-1966	Angus Co. Ltd., P.O. Angus, Hooghly	Jute hessian — IS : 2818-1964
CM/L-876 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-877 28-11-1964	1-12-1965	30-11-1966	Samnuggur Jute Factory Co. Ltd., Bhadreswar, Hooghly	Jute hessian — IS : 2818-1964
CM/L-878 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-879 28-11-1964	1-12-1965	30-11-1966	Titaghur Jute Factory Co. Ltd., P.O. Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-880 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-881 28-11-1964	1-12-1965	30-11-1966	Victoria Jute Co. Ltd., P.O. Telinipara, Distt. Hooghly	Jute hessian — IS : 2818-1964
CM/L-882 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-883 28-11-1964	1-12-1965	30-11-1966	Hastings Mills Ltd., Rishra, Hooghly	Jute hessian — IS : 2818-1964
CM/L-884 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-885 28-11-1964	1-12-1965	30-11-1966	Fort William Co. Ltd., 47/48 Raj Narain Roychowdhury Ghat Road, Shibpore, Howrah	Jute hessian — IS : 2818-1964
CM/L-886 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

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CM/L-887 28-11-1964	1-12-1965	30-11-1966	Khardah & Company Ltd., Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-888 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-893 28-11-1964	1-12-1965	30-11-1966	Hukumchand Jute Mills Ltd., 47 Ghoshpara Road, Halisahar	Jute hessian — IS : 2818-1964
CM/L-894 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-895 28-11-1964	1-12-1965	30-11-1966	Anglo-India Jute Mills Co. Ltd., (Lower Mill), P.O. Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-896 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-897 28-11-1964	1-12-1965	30-11-1966	Anglo-India Jute Mills Co. Ltd., (Middle Mill), P.O. Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-898 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-899 28-11-1964	1-12-1965	30-11-1966	Nakarpara Jute Co. Ltd., 220/2 Shibogopal Banerjee Le, Ghusuri, Howrah	Jute hessian — IS : 2818-1964
CM/L-900 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-901 28-11-1964	1-12-1965	30-11-1966	Shree Ambica Jute Mills Ltd., P.O. Belurmath, Howrah	Jute hessian — IS : 2818-1964
CM/L-902 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1954 and IS : 2875-1964
CM/L-903 28-11-1964	1-12-1965	30-11-1966	Gagalbhai Jute Mills (P) Ltd., Sijberia, P.O. Ulberia, Howrah	Jute hessian — IS : 2818-1964
CM/L-904 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-905 28-11-1964	1-12-1965	30-11-1966	Caledonian Jute Mills Co. Ltd., 18 Mehta Road, Badekalinagar, Budge Budge, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-906 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-907 28-11-1964	1-12-1965	30-11-1966	The Calcutta Jute Mfg. Co. Ltd., 93 Narkeldanga Main Road, Calcutta	Jute hessian — IS : 2818-1964
CM/L-908 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-911 28-11-1964	1-12-1965	30-11-1966	Shree Gourishankar Jute Mills (P) Ltd., Ghoshpara Road, P.O. Garulia, Sumnagar, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-912 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-913 28-11-1964	1-12-1965	30-11-1966	Bally Jute Co. Ltd., 58 Scott Kerr Road, Bally, Howrah	Jute hessian — IS : 2818-1964
CM/L-914 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-915 28-11-1964	1-12-1965	30-11-1966	Birla Jute Mfg. Co. Ltd., Birlapur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-916 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-917 28-11-1964	1-12-1965	30-11-1966	Soorah Jute Mills Co. Ltd., 102 Narkeldanga Main Road, Calcutta	Jute hessian — IS : 2818-1964
CM/L-918 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-919 28-11-1964	1-12-1965	30-11-1966	The Naihati Jute Mills Co. Ltd., P.O. Hazinagar, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-920 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

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CM/L-921 28-11-1964	1-12-1965	30-11-1966	Fort Gloster Industries Ltd. (New Mill), P.O. Fort Gloster, Rly Station Bauria, Distt. Howrah	Jute hessian — IS : 2818-1964
CM/L-922 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-923 28-11-1964	1-12-1965	30-11-1966	Fort Gloster Industries Ltd. (North Mill), P.O. Fort Gloster, Rly Station Bauria, Distt. Howrah	Jute hessian — IS : 2818-1964
CM/L-924 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-925 28-11-1964	1-12-1965	30-11-1966	The Hooghly Mills Co. Ltd., 9 Garden Reach Road, Kidderpore, Calcutta	Jute hessian — IS : 2818-1964
CM/L-926 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-927 28-11-1964	1-12-1965	30-11-1966	Champdany Jute Co. Ltd. (Wellington Jute), G.T. Road, Rishra, Hooghly	Jute hessian — IS : 2818-1964
CM/L-928 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-929 28-11-1964	1-12-1965	30-11-1966	Alexandra Jute Mills Ltd., Jagatdal, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-930 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-931 28-11-1964	1-12-1965	30-11-1966	Eastern Manufacturing Co. Ltd., Ali Hyder Road, Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-932 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-933 28-11-1964	1-12-1965	30-11-1966	Empire Jute Co. Ltd., Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-934 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-935 28-11-1964	1-12-1965	30-11-1966	Kelvin Jute Co. Ltd., Titaghur, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-936 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-937 28-11-1964	1-12-1965	30-11-1966	Presidency Jute Mills Co. Ltd., Rishra, Hooghly	Jute hessian — IS : 2818-1964
CM/L-938 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-939 28-11-1964	1-12-1965	30-11-1966	The General Industrial Society Ltd., Gondalpara, Hooghly	Jute hessian — IS : 2818-1964
CM/L-940 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-941 28-11-1964	1-12-1965	30-11-1966	New Central Jute Mills Co. Ltd. (Albion Mills), Budge Budge, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-942 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-943 28-11-1964	1-12-1965	30-11-1966	New Central Jute Mills Co. Ltd. (Lothian Mills), Budge Budge 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-944 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-945 28-11-1964	1-12-1965	30-11-1966	Ganges Mfg. Co. Ltd., Bansberia, Hooghly	Jute hessian — IS : 2818-1964
CM/L-946 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-953 28-11-1964	1-12-1965	30-11-1966	Shree Mahadeo Jute Mills Co., 226 G.T. Road, Bally, Howrah	Jute hessian — IS : 2818-1964
CM/L-954 28-11-1964	1-12-1964	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

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CM/L-955 28-11-1964	1-12-1965	30-11-1966	Bharat Jute Mills Ltd., Dasnagore, Howrah	Jute hessian — IS : 2818-1964
CM/L-956 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-957 28-11-1964	1-12-1965	30-11-1966	Prabartak Jute Mills Ltd., Kamarhatti, B. T. Road, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-958 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566 1965, IS : 2874-1964 and IS : 2875-1964
CM/L-959 28-11-1964	1-12-1965	30-11-1966	Reliance Jute Mills Co. Ltd., Rly Station Kankinarrah, P.O. Bhatpara, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-960 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-961 28-11-1964	1-12-1965	30-11-1966	Kanoria Co. Ltd., Chengail Rly Station, P.O. Chakasi, Howrah	Jute hessian — IS : 2818-1964
CM/L-962 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-963 28-11-1964	1-12-1965	30-11-1966	Naffar Chandra Jute Mills Ltd., Kankinarrah, 24 Parganas	Jute hessian — IS : 2818-1964
CM/L-964 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-967 28-11-1964	1-12-1965	30-11-1966	Victory Jute Mills, 15-B Garden Reach Road, Calcutta	Jute hessian — IS : 2818-1964
CM/L-968 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-969 28-11-1964	1-12-1965	30-11-1966	Bhutoria Bros (P) Ltd., 130 Dharamtolla Road, Salkia, Howrah	Jute hessian — IS : 2818-1964
CM/L-970 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-971 28-11-1964	1-12-1965	30-11-1966	Chittavalsah Jute Mills Co. Ltd., Chittavalsah, Visakhapatnam	Jute hessian — IS : 2818-1964
CM/L-972 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964
CM/L-973 28-11-1964	1-12-1965	30-11-1966	Nellimarla Jute Mills Co. Ltd., Nellimarla, Visakhapatnam	Jute hessian — IS : 2818-1964
CM/L-974 28-11-1964	1-12-1965	30-11-1966	do	Jute sackings — IS : 1943-1964, IS : 2566-1965, IS : 2874-1964 and IS : 2875-1964

LICENCES LAPSED OR RENEWAL DEFERRED

SL NO.	LICENCE NO. (CM/L-)	NAME AND ADDRESS OF THE LICENSEE	RELEVANT IS NO.	REMARKS	GAZETTE OF INDIA, PART II, SECTION 3 (ii), NOTIFICATION REFERENCE S.O. No. and Date	Gazette Issue Dated
1	594	Bombay Switchgears, Laxmi Woollen Mills Estate, Shakti Mills Lane, Off Haines Road, Mahalaxmi, Bombay	Metal clad switches, 15 amp 250 and 650 volts and 30 amp 500 volts grade — IS : 1567-1960	Lapsed after 15-11-1965		
2	596	Pesticides India, Udaisagar Road, Udaipur (Rajasthan)	DDT water dispersible powder concentrates — IS : 565-1961	Deferred after 30-11-1965		
3	819	Sri Dhanalakshmi Sago Factory, Namagiripet, Rasipuram Taluk, Salem-2 (Madras State)	do	do	58 17-12-1965	1-1-1966
4	825	Ram Tirath Iron & Steel Re-Rolling Mills, Mandi, Govindgarh (Punjab)	Structural steel (standard quality) — IS : 226-1962	Deferred after 15-11-1965		
5	826	do	Structural steel (ordinary quality) — IS : 1977-1962	do		
6	838	Associated Industrial Corpn., 39 Factory Area, Fazalganj, Kanpur	18-litre square tins — IS : 916-1958	Deferred after 30-11-1965		

IMPLEMENTATION OF INDIAN STANDARDS

■ ADOPTION

A list of Indian Standards adopted by various Government purchasing and consuming departments during November 1965 is given below. On 30 November 1965, 3 235 Indian Standards were in force out of which 2 429 had thus been adopted by the Government.

Research, Designs & Standards Organization

IS : 2-1960 Rules for rounding off numerical values (*revised*)
IS : 106-1962 Ready mixed paint, brushing, priming for enamels for use on wood (*revised*)
IS : 118-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes, to Indian Standard colours (*revised*)
IS : 119-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes to Indian Standard colours (*revised*)
IS : 120-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes to Indian Standard colours (*revised*)
IS : 121-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes to Indian Standard colour No. 414, golden brown (*revised*)
IS : 122-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes, to Indian Standard colours (*revised*)
IS : 124-1962 Ready mixed paint, brushing, finishing, semi-gloss, for general purposes, to Indian Standard colour No. 105, oxford blue (*revised*)
IS : 282-1963 Hard drawn copper conductors for overhead power transmission (*revised*)
IS : 961-1962 Structural Steel (high tensile) (*revised*)
IS : 1110-1964 Ferro silicon (*revised*)
IS : 1148-1964 Rivet bars for structural purposes (*revised*)
IS : 1149-1964 High tensile rivet bars for structural purposes (*revised*)
IS : 1361-1959 Steel windows for industrial buildings
IS : 1444-1963 Engineers' pattern drawing boards (*revised*)
IS : 1786-1961 Cold twisted steel bars for concrete reinforcement
IS : 2073-1962 Carbon steel bars for production of machined parts for general engineering purposes
IS : 2115-1962 Code of practice for flat roof finish : Mud *phuska*
IS : E2300-1963 Non-metal helmets for civil defence
IS : 2309-1963 Code of practice for the protection of buildings and allied structures against lightning
IS : 2312-1963 Propeller type ac ventilating fans
IS : 2316-1963 Methods of preparation of standard solutions for colorimetric and volumetric analysis
IS : 2317-1963 Method for gravimetric determination of sulphates
IS : 2325-1963 Ignition coils
IS : 2326-1963 Automatic flushing cisterns for urinals
IS : 2327-1963 Dimensions for straight sides splines for general engineering use
IS : 2339-1963 Aluminium paint for general purposes in dual container
IS : 2370-1963 Sectional cold rooms (walk-in-type)
IS : 2386 (Part I)-1963 Methods of test for aggregates for concrete : Part I Particle size and shape
IS : 2386 (Part II)-1963 Methods of test for aggregates for concrete : Part II Estimation of deleterious materials and organic impurities
IS : 2386(Part III)-1963 Methods of test for aggregates for concrete : Part III Specific gravity, density, voids, absorptions and bulking
IS : 2386 (Part IV)-1963 Methods of test for aggregates for concrete : Part IV Mechanical properties
IS : 2386 (Part V)-1963 Methods of test for aggregates for concrete : Part V Soundness
IS : 2386 (Part VI)-1963 Methods of test for aggregates for concrete : Part VI Measuring mortar making properties of fine aggregates
IS : 2517-1963 Bright bars for threaded components
IS : 2539-1963 Plane tables
IS : 2690-1964 Burnt clay flat terracing tile
IS : 2812-1964 Recommendations for manual tungsten inert gas arc-welding of aluminium and aluminium alloys
IS : 3031-1964 Leather cash bags

■ RECOMMENDATION FOR IMPLEMENTATION

The Government of India issued a notification in the Gazette of India, Extraordinary dated 11 October 1965 recognizing the Indian Standard IS : 2083-1962 Flashlight as the standard specification for flashlight for the purpose of export.

NEW SUBJECTS

CIVIL ENGINEERING DEPARTMENT

Foot valves
Different types of traps
Sand lime bricks
Shrinkage values of Indian timbers
Design and construction of structural floors using hollow clay products
Soil for masonry mortar
Use of stabilized soil in base course for pavements
Ventilator chains
Estimation of suspended and bed loads in open channels
Flow measuring instruments
Veneered lumber core boards
Laying of stoneware pipes
Oars and paddles
Criteria for design of reinforced concrete chimneys
Sewage treatment equipment
Design and construction of foundations of tall structures laterally loaded, such as transmission line towers and poles
Measurement of various types of civil engineering works
Criteria for selection, design, construction, maintenance and model testing of various types of dams
Criteria for selection, design, construction, maintenance and model testing of various types of spillways
Criteria for selection, design, construction, maintenance and model testing of various types of energy dissipators
Materials for and practices of lining of canals
Standard cross-sections for canals
Design and construction of canals
Maintenance and safety of canals
Canal structures
School library buildings

INDIAN STANDARDS

The standards listed below have been classified subject-wise and not according to the Departments in ISI responsible for formulating them.

■ NEW INDIAN STANDARDS

AGRICULTURAL AND FOOD PRODUCTS

IS : 3309-1965 Soluble French coffee powder. *Re* 1·00. Prescribes requirements and methods of test for soluble French coffee powder prepared by dehydration of an aqueous extract or a mixture of aqueous extracts prepared from roasted and ground coffee and roasted and ground chicory.

CHEMICALS

IS : 3241-1965 Geranyl acetate. *Re* 1·00. Prescribes requirements and methods of sampling and test for geranyl acetate used extensively for compounding many kinds of perfumes for cosmetics, toiletries and soaps, and in the blending of artificial essential oils and flavours.

IS : 3242-1965 β-oxynaphthonic acid (bon acid). *Rs* 3·00

IS : 3321-1965 Formaldehyde solution. *Rs* 2·00

IS : 3349-1965 Resinoid benzoin, pure. *Rs* 2·00

CIVIL ENGINEERING

IS : 3150-1965 Galvanized wire netting. *Rs* 2·40
(British Standard 'B.S. 1485 : 1948' recognized as an Indian Standard with slight modifications.)

IS : 3316-1965 Method of sampling and grading structural granite. *Re* 1·00

IS : 3337-1965 *Ballies* for general purposes. *Rs* 1·50

CONSUMER PRODUCTS

IS : 888-1965 Hollow-ground razors, open type (*revised*). *Rs* 1·50

IS : 3257-1965 Stainless steel compartmental trays. *Rs* 1·50

IS : 3258-1965 Stainless steel serving utensils. *Rs* 2·50. Lays down requirements for service trays (rectangular, oval and round), entree dishes (oval and round) and jugs.

DRAWING INSTRUMENTS

IS : 3207-1965 Engineers' drawing instruments, rotating compasses. *Rs* 1·50. Covers requirements of rotating compasses provided with interchangeable pen and pencil points for engineers' drawing instruments.

IS : 3210-1965 Engineers' drawing instruments, drawing pens. *Rs* 1·50. Covers requirements of drawing pen having a handle and drawing nib. The drawing nib may be plain nib, shifting nib or a lifting nib for engineers' drawing instruments.

IS : 3211-1965 Engineers' drawing instruments, pen points. *Rs* 1·50. Covers requirements of interchangeable pen points of the types (a) pen point, plain nib; (b) pen point, shifting nib; and (c) pen point, lifting nib.

IS : 3212-1965 Engineers' drawing instruments, lengthening bars. *Re* 1·00

IS : 3213-1965 Engineers' drawing instruments, handles. *Re* 1·00

IS : 3214-1965 Engineers' drawing instruments, pencil points. *Re* 1·00

ELECTRICAL ENGINEERING

IS : 2516 (Part II/Sec 2)-1965 Alternating current circuit-breakers: Part II Tests; Section 2 Voltage above 1 000 up to and including 11 000 volts. *Rs* 7·00

IS : 3035 (Part II)-1965 Thermoplastic insulated weatherproof cables: Part II Polythene insulated, taped, braided and compounded. *Rs* 3·50. Covers requirements of single and flat twin core polythene insulated, taped, braided and weatherproof compounded cables for outdoor service connections of voltage grades 250/440 and 650/1100 volts. Also covers specific requirements of weatherproof cables and has to be read in conjunction with 'IS : 1596-1962 Polythene insulated and PVC sheathed cables up to 250 V'.

IS : 3323-1965 Bi-pin lampholders for tubular fluorescent lamps. *Rs* 4·50. Lays down dimensional, safety and performance requirements of medium bi-pin lampholders for use with tubular fluorescent lamps for general lighting service fitted with G 13 bi-pin caps (*see* 'IS : 2418-1964 Tubular fluorescent lamps for general lighting service'). Bi-pin lampholders designed for special purposes such as waterproof type, flameproof type, etc, are excluded.

EQUIPMENT, TOOLS AND APPLIANCES

IS : 908-1965 Fire hydrant, stand post type (*revised*). *Rs* 2·00, and IS : 936-1965 Underground fire hydrant, double valve type (*revised*). *Rs* 2·00.

The revised standards take into account the difficulties in regard to raw materials and construction experienced during the last seven years of their currency and provide for additional raw materials and additional details of construction. The standards permit the use of copper alloys and aluminium alloy only in the manufacture of the male coupling to be fitted on the outlet of the hydrant.

IS : 921-1965 Butcher's knives (*revised*). *Rs* 2·50. Covers requirements of (a) flaying knife, large; (b) flaying knife, small; (c) cutting knife; and (d) sticking knife. Besides giving dimensions in metric units, a sampling plan and criteria for conformity have also been included in this revision.

IS : 937-1965 Washers for water fittings for fire fighting purposes (*revised*). *Re* 1·00. In this revision, opportunity has been taken to specify the sizes of washers and all other dimensions in metric units.

IS : 2771-1965 Corrugated fibre-board boxes. *Rs* 1·50. Prescribes requirements for corrugated fibre-board boxes weighing not more than 55 kg with contents. Requirements of waterproof boxes are excluded.

IS : 3006-1965 Chemically resistant salt-glazed stone-ware pipes and fittings. *Rs* 5·50. Covers the material and performance requirements for (a) straight pipes, and (b) fittings — (1) taper pipes, (2) bends, (3) taper bends, (4) junctions, (5) half-section channels, straight and taper, (6) channel junctions, (7) channel bends, (8) channel interceptors, (9) gully traps, and (10) inspection pipes. The salt-glazed stoneware pipes and fittings covered by this specification are corrosion resistant to practically all chemicals and gases except hydrofluoric acid, its derivatives and hot caustic alkalies.

IS : 3148-1965 Metallic slide fasteners. *Rs* 4·80. (British Standard 'B.S. 3084 : 1963' recognized as an Indian Standard with a few modifications.)

IS : 3311-1965 Waste plug and its accessories for sinks and wash-basins. *Re* 1·00. Covers requirements for materials, manufacture, construction, testing and finish of waste plug, chain and stay suitable for use in wash-basins and sinks complying with 'IS : 771-1963 Glazed earthenware sanitary appliances (*revised*)'; and 'IS : 2556-1963 Vitreous sanitary appliances (vitreous china)'. The specification provides for two types of stays, namely, bolt type and screw type.

IS : 3314-1965 Metal cloths lockers. *Rs* 1·50

IS : 3315-1965 Evaporative air coolers (desert coolers). *Rs* 2·00.

Covers nominal capacities constructional and performance requirements and methods of testing evaporative air coolers.

FARM IMPLEMENTS

IS : 3185-1965 'V' blade hand hoe. *Rs* 2·00

IS : 3293-1965 Levelling *karaha* (*keni*), animal drawn. *Rs* 2·00. Prescribes requirements for two types of the levelling *karaha* used for shaping the land and forming large bunds and terraces.

IS : 3327-1965 Paddy thresher, pedal operated. *Rs* 2·00. Prescribes requirements and method of test for a comparatively new machine, pedal operated paddy thresher used to separate grains from the harvested crops.

IS : 3342-1965 *Triphali* (three-tined cultivator) animal drawn. *Rs* 2·00

MECHANICAL ENGINEERING

IS : 2817-1965 Methods for sampling of coated abrasives. *Rs* 1·50

IS : 3048-1965 Dimensions for hand-wheels. *Rs* 2·50

IS : 3075-1965 Dimensions for circlips. *Rs* 4·00

IS : 3172-1965 Banjo connections for fuel injection equipment for diesel engines. *Re* 1·00

IS : 3173-1965 High pressure connections for fuel injection equipment for diesel engines. *Rs* 2·00. Specifies dimensions and other requirements for high pressure connections, such as, connecting stud, cap nut, and nipple ends of pipe; and pressure washer, used for connecting fuel injection equipment in diesel engines. In addition to the dimensions for pressure pipe connections for fuel injection equipment specified in metric units, the dimensions of similar connections recommended by the Society of Motor Manufacturers and Traders (SMMT) of the UK have also been provided as an alternate choice.

IS : 3177-1965 Code of practice for design of overhead travelling cranes and gantry cranes other than steel work cranes. *Rs* 6·50. Covers mechanical, electrical, inspection and testing operations as related to design, manufacture, erection and testing of overhead travelling and gantry cranes, in order to secure safe, efficient and reliable working during service.

IS : 3290-1965 Thread take up levers for cam type sewing machines for household purposes. *Rs* 2·00. The specification does not cover thread take up levers used in the industrial and special purpose machines.

IS : 3291-1965 Thread take up cams for sewing machines for house-hold purposes. *Rs* 1·50. The specification does not cover thread take up cams used in industrial and special purpose machines.

IS : 3298-1965 Mild steel rivet bars for ship building. *Rs* 1·50. Covers requirements for rivet bars of 16 mm diameter and over, made from mild steel intended to be used for building.

IS : 3299-1965 Oscillating rock shafts for sewing machines for house-hold purposes. *Rs* 2·00

IS : 3300-1965 Dimensions for mounted points. *Rs* 3·00. Classifies the shapes and sizes of mounted points used extensively in industry for a variety of applications, such as deburring, smoothing and polishing tools, dies, metal patterns and moulds.

MEDICAL EQUIPMENT

IS : 3234-1965 Conical fitting for hypodermic syringes, needles and other medical equipment, Luer type. *Re* 1·00

SPORTS GOODS

IS : 414-1965 Guts for tennis, badminton and squash rackets (*revised*). *Re* 1·00

IS : 3345-1965 Sports nets. *Re* 1·00. Covers the requirements for nets for lawn tennis, badminton, table tennis, volleyball, tenikoit, basketball, cricket practice, football goals and hockey goals.

STRUCTURAL AND METALS

IS : 27-1965 Pig lead (*second revision*). *Re* 1·00

IS : 224-1965 Foundry pig iron (coke) for general purposes (*second revision*). *Rs* 2·00

IS : 1254-1965 Corrugated aluminium sheet. *Re* 1·00. Specifies the material, profile, dimensions and finish for corrugated aluminium sheet and covers requirements for: (a) general purpose sheet, (b) industrial sheet, and (c) building sheet. The revision gives values in metric weights.

IS : 1339-1965 Lead alloys for sheathing of electric cables (*revised*). *Re* 1·00

IS : 3288 (Part I)-1965 Glossary of terms for copper and copper alloys : Part I General. *Re* 1·00

IS : 3331-1965 Copper foil and brass strip for radiator cores. *Rs* 2·00

IS : 3343-1965 Natural moulding sand for use in foundries. *Re* 1·00

TEXTILES

IS : 2244-1965 Glossary of terms relating to treated fabrics. *Rs* 2·50

IS : 3255-1965 Cotton tapes for parachutes. *Rs* 2·00. Prescribes constructional details and other particulars of 4 varieties of cotton tapes, scoured, used in supply dropping parachutes but does not specify the general appearance, feel, etc, of the tapes.

IS : 3325-1965 Code for inland packaging of cotton hosiery yarn and goods. *Rs* 1·50

IS : 3326-1965 Cotton stockinette. *Rs* 2·00. Prescribes constructional particulars and other requirements of scoured stockinette. This does not prescribe the feel, general appearance, etc, of the stockinette.

IS : 3330-1965 Wool-cotton vests. *Rs* 3·00. Prescribes constructional details and other particulars of scoured, bleached or dyed, plain knitted wool-cotton vests, round neck with sleeves. This does not specify the general appearance, feel, colour, etc, of the vests.

IS : 3340-1965 Jacquard harness. *Rs* 1·50. Prescribes requirements of Jacquard harness which consists of (a) a *lingoe*, (b) a *lower coupling loop*, (c) a *mail*, (d) an *upper coupling* loop, and (e) mounting thread. The specification does not include: (a) the methods of building harnesses, that is, the method of connecting the mounting

threads of the tail cords of the books of jacquard; and (b) the recommendations about the type of tie-ups to be used.

IS : 3341-1965 Dobby harness. *Rs* 2·00

IS : 3344-1965 D.W. tarpauling jute bags for packing (mint) coins. *Rs* 2·50. Prescribes constructional details and other particulars of hemmed D.W. (double warp) tarpauling jute bags for packing (mint) coins of dimensions 47×35 cm (or 18½×13¾ in) and 42×28 cm (or 16½×11 in).

MISCELLANEOUS

IS : 3297-1965 Water-resistant vegetable tanned sole leather. *Rs* 1·50

IS : 3328-1965 Quality tolerances for water for swimming pools. *Rs* 1·50

■ DRAFT INDIAN STANDARDS

AGRICULTURAL AND FOOD PRODUCTS

Guavas

Limes

Seed potatoes

Sugarcane setts

CHEMICALS

Lead and scarlet chromes

Method for determination of strength of azo dyes by reduction with titanium trichloride

Nitric acid (*revision of* IS : 264)

CIVIL ENGINEERING

Abbreviated symbols for timber species (*revision of* IS : 1150)

Code of practice for painting concrete plaster and masonry surfaces : Part 1 Operations and workmanship

Cut sizes of timber (*revision of* IS : 1331)

Mortice locks (vertical type) (*revision of* IS : 2209)

ELECTRICAL ENGINEERING

Method of measurement of cooling-medium temperature for electrical apparatus

MECHANICAL ENGINEERING

Calibrated high tensile steel chain (round link) for chain conveyors and coal ploughs used in mines

Feed lifting rock shaft for sewing machines for household purposes

Glossary of conveyor terms and definitions

Rigid liferafts

Test chart for wood turning lathes

Test chart for wood working bandsaws

Test chart for wood working circular saws

Troughed belt conveyors

Underground troughed belt conveyors

STRUCTURAL AND METALS

Antimonial lead for storage batteries (*revision of* IS : 1654)

Antimony (*second revision* of IS : 211)

Centrifugally cast (spun) iron pressure pipes for water, gas and sewage (*revision of* IS : 1536)

Centrifugally cast (spun) iron spigot and socket soil, waste and ventilating pipes

Dental gold alloy wire

Ferro nickel

Limestone for use in foundries

Macrostreak flaw test for steel

Misch metal

Soft solder

Steel for spring washers

Steel for the manufacture of laminated springs (railway rolling stock)

Tin ingot (*second revision of* IS : 26)

Tool and die steel for hot work

Zinc (*second revision of* IS : 209)

Zinc base alloy die castings (*revision of* IS : 742)

Zinc base alloy ingots for die castings (*revision of* IS : 713)

TEXTILES

Gents' worsted slipovers

Method for determination of dimensional changes in washing of woven silk fabrics

Method for determination of water soluble matter of textile materials

Method for testing flax fabrics for resistance to attack by micro-organisms.

■ KEEP YOUR STANDARDS UP TO DATE

Given below are particulars of amendments to Indian Standards published during November 1965. Copies of the amendments issued from time to time are automatically mailed to those who possess Indian Standards and are registered with ISI for the purpose. Others may obtain them free of charge from the Sales Service, ISI.

These amendments were Published in the Gazette of India, Part II, Section 3(ii), dated 4-12-1965 under Notification Number S.O. 3773 dated 23-11-1965

No. 1 August 1965	IS : 221-1962 Specification for ink fluid, blue black, for permanent records
No. 1 August 1965	IS : 222-1962 Specification for ink fluid for general purposes (*revised*)
No. 1 August 1965	IS : 329-1961 Specification for oil of sandalwood (*revised*)
No. 1 August 1965	IS : 487-1954 Specification for brushes, paints and varnishes, (i) Oval, ferrule bound and (ii) Round, copper wire bound
No. 1 June 1965	IS : 514-1962 Specification for mercerized cotton fabric, Grade 1, for aircraft (*revised*)
No. 1 September 1965	IS : 554-1964 Dimensions for pipe threads for gas list tubes and pressure tight screwed fittings (*revised*)
No. 1 July 1965	IS : 596-1962 Specification for mercerized cotton fabric, for gliders (*revised*)
No. 1 June 1965	IS : 598-1962 Specification for mercerized cotton fabric, Grade 2, for aircraft (*revised*)
No. 1 August 1965	IS : 648-1962 Specification for steel sheets for magnetic circuits of power electrical apparatus (non-oriented steel) (*revised*)
No. 1 June 1965	IS : 714-1962 Specification for cotton reinforcing tape for aircraft (*revised*)
No. 1 August 1965	IS : 722 (Part I)-1962 Specification for ac electricity meters: Part I General requirements (*revised*)
No. 1 September 1965	IS : 722 (Part II)-1962 Specification for ac electricity meters: Part II Single-phase 2-wire whole-current watt-hour meters (*revised*)
No. 1 August 1965	IS : 809-1957 Specification for rubber flooring materials for general purposes
No. 1 August 1965	IS : 841-1957 Specification for hand hammers

No. 1 September 1965	IS : 938-1964 Specification for 1350-l/min (or 300-gal/min) small fire engine (*revised*)
No. 1 September 1965	IS : 984-1962 Method for determination of colour fastness of textile materials to washing in the presence of sodium hypochlorite
No. 2 June 1965	IS : 1010-1957 Specification for *suji* or *rava* (semolina)
No. 1 July 1965	IS : 1088-1957 Specification for oil, clock and watch
No. 1 July 1965	IS : 1156-1957 Specification for pearl barley
No. 1 June 1965	IS : 1157-1957 Specification for barley powder
No. 1 August 1965	IS : 1177-1957 Specification for vetiver (*khus*) oil
No. 1 July 1965	IS : 1269-1964 Specification for metric, woven metallic and glass fibre tape measures (*revised*)
No. 1 August 1965	IS : 1342-1964 Specification for oil pressure stoves (*revised*)
No. 1 August 1965	IS : 1380-1959 Specification for ink, finger printing, black
No. 1 August 1965	IS : 1381-1959 Specification for boiling flasks (narrow-necked)
No. 2 August 1965	IS : 1462-1959 Specification for talc for cosmetic industry
No. 1 July 1965	IS : 1574-1960 Specification for glass weighing bottles
No. 1 August 1965	IS : 1575-1960 Specification for separating funnels
No. 1 August 1965	IS : 1590-1960 Specification for glass filter flasks
No. 2 August 1965	IS : 1614-1960 Specification for oil of vetiver roots (cultivated)
No. 1 August 1965	IS : 1615-1960 Specification for oil of himalayan cedar wood
No. 1 August 1965	IS : 1616-1960 Specification for oil of spike lavender
No. 1 August 1965	IS : 1617-1960 Specification for oil of lavandin
No. 1 August 1965	IS : 1666-1961 Specification for paper-covered rectangular copper conductors for transformer windings
No. 1 September 1965	IS : 1726-1960 Specification for cast iron manhole covers and frames intended for use in drainage works
No. 2 September 1965	IS : 1854-1964 Specification for person weighing machines (*revised*)
No. 2 July 1965	IS : 1901-1961 Specification for visual indicator lamps
No. 1 August 1965	IS : 1912-1961 Specification for country jute twine, three-ply
No. 1 August 1965	IS : 1945-1961 Specification for glass bottles for fluid ink
No. 1 July 1965	IS : 2002-1962 Specification for steel plates for boilers
No. 1 August 1965	IS : 2004-1962 Specification for carbon steel forgings for general engineering purposes
No. 2 August 1965	IS : 2026-1962 Specification for power transformers
No. 1 August 1965	IS : 2172-1962 Specification for handloom filament rayon saries
No. 1 September 1965	IS : 2260-1963 Recommendations for the conditioning and testing of electrical insulating materials
No. 1 June 1965	IS : E2298-1963 Specification for single-barrel stirrup pump for fire fighting purposes
No. 1 September 1965	IS : 2312-1963 Specification for propeller type ac ventilating fans
No. 1 August 1965	IS : 2360-1963 Specification for worsted jerseys
No. 1 August 1965	IS : 2423-1963 Specification for nylon georgette
No. 1 August 1965	IS : 2448 (Part I)-1963 Specification for adhesive insulating tapes for electrical purposes : Part I Tapes with cotton textile subtrates
No. 2 July 1965	IS : 2465-1963 Specification for cables for motor vehicles
No. 1 May 1965	IS : 2534-1963 Specification for carbide tipped dead centres
No. 1 August 1965	IS : 2560-1963 Specification for rubber-based adhesives for tyres and tubes, non-curing
No. 1 August 1965	IS : 2561-1963 Specification for rubber-based adhesives for the automobile industry
No. 1 August 1965	IS : 2562-1963 Specification for rubber-based adhesives for tyres and tubes, curing
No. 1 September 1965	IS : 2630-1964 Specification for nitrobenzene, technical
No. 1 September 1965	IS : 2659-1964 Specification for enamelled round copper wire for elevated temperatures
No. 1 September 1965	IS : 2665-1964 Specification for cadmium copper wire for telegraph and telephone purposes
No. 1 September 1965	IS : 2720 (Part XV)-1965 Methods of test for soils : Part XV determination of consolidation properties
No. 1 June 1965	IS : 2788-1964 Specification for gas mantles
No. 2 August 1965	IS : 2818-1964 Specification for Indian hessian
No. 1 August 1965	IS : 2819-1964 Specification for braided cotton cord
No. 1 September 1965	IS : 2830-1964 Specification for carbon steel billets for re-rolling into structural steel (standard quality)
No. 1 September 1965	IS : 2977-1964 Method for determination of dimensional changes of woven fabrics (other than wool) on soaking in water
No. 1 August 1965	IS : 2979-1964 Specification for fuel oil

NEW ISI MEMBERS

The following 9 organizations and individuals were enrolled as Subscribing Members of ISI for the year 1965 during November 1965. The net subscribing membership of ISI as on 30 November was 3 642 with 2 170 Sustaining Members, 948 Sustaining Members (Associates) and 524 Ordinary Members.

■ SUSTAINING MEMBERS

Bharat Forge Company Ltd., Poona
Fertilizer Corporation of India Ltd., Gorakhpur Division, Gorakhpur
G. R. Industries, Calcutta
M. N. Chatterjee & Company, Howrah

■ SUSTAINING MEMBERS (ASSOCIATES)

Assam Plywood Products, Dibrugarh
Government Polytechnic, Hyderabad

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STANDARDS FROM COMMONWEALTH COUNTRIES

■ NEW STANDARDS

AUSTRALIA

AS A16 : 1965 Glossary of terms used in road engineering

AS A122 : 1965 Heat-actuated detectors for automatic fire alarm installations

AS A126 : 1965 Coal-tar primer for steel pipes

AS A127 : 1965 Coal-tar enamel for steel pipes (this standard is enclosed with AS A126)

AS A145 : 1965 Centrifugally cast iron pressure pipes for water, gas and sewage

AS B35 : 1965 Draw-off taps, step taps and ferrule or main taps for use in water supply and hot water services

AS B106 : Part 2 : 1965 Method for vickers hardness test : Part 2 Verification of the testing machine

AS B164 : 1965 Radiographic examination of fusion welded butt joints in steel

AS CA15 : 1965 Automatic fire alarm installations

AS CA30 : 1965 Artificial lighting of buildings

AS CA36 : 1965 Coating and lining of steel pipes with coal-tar enamel (this standard is enclosed with AS A126 : 1965)

AS E39 : 1965 Small freight containers

AS K129 : 1965 Marine underwater paint system for the bottoms of steel ships

AS K139 : 1965 Flexible, unsupported thick PVC sheeting

AS N56 : 1965 Austenitic stainless steel pipes for milking machines and auxiliary equipment

AS N57 : 1965 Glass pipes and fittings for milking machines and auxiliary equipment

AS N61 : 1965 Method for the determination of the solubility index of dried milk

AS O36 : 1965 Timber used in the manufacture of joinery in Western Australia

AS P208m : 1964 Physical testing of hardsheets

AS P425r.p : 1961 Tensile strength of shipping sack paper

AS R1 : 1965 Safety glass for land transport

AS S1 : 1965 Household furniture (minimum requirements for materials, construction, workmanship and finish)

CANADA

CSA C22. 2No. 135 : 1965 Asbestos-cement conduit; Canadian electrical code; Part II Safety standards for electrical equipment

CSA C22.5 : 1965 Canadian electrical code : Part V Use of electricity in mines

CSA O141 : 1965 Soft wood lumber

CSA Z7.3.1.5 : 1965 Roll film and leaders and trailers for aerial photography

CANADA-CANADIAN GOVT. SPECIFICATION BOARD

1-GP-178a : 1965 Primer; zinc dust/zinc oxide, alkyd (for galvanized surfaces)

49-GP-40 : 1965 Girls' flat knit T-shirts (outerwear) and polo shirts

49-GP-41 : 1965 Girls' knitted fleece-lined sweat shirts (with and without hoods, pullover and open-front styles)

49-GP-52 : 1965 Toddlers; children's and girls' sweaters classic and bulky-knit (pullovers, cardigans, with sleeves and sleeveless)

49-GP-53 : 1965 Boys' sweaters-classic and bulky-knit (pullovers, cardigans, with sleeves and sleeveless)

49-GP-54 : 1965 Boys' knitted fleece-lined sweat shirts (with and without hoods, pullover and open-front styles)

NEW ZEALAND

NZSS 362 : 1965 School paper stationery

UNITED KINGDOM

B.S. 132 : 1965 Steam turbines

B.S. 903 : Part D4 : 1965 Methods of testing vulcanized rubbers : Part D4 Determination of cross-breaking strength of ebonite

B.S. 1083 : 1965 Precision hexagon bolts, screws & nuts (B.S.W. & B.S.F. threads)

B.S. 1420 : 1965 Glossary of terms applicable to wrought products in copper, zinc and their alloys

B.S. 1521 : 1965 Waterproof building papers

B.S. 1580 : Part 3 : 1965 Unified screw threads : Part 3 Diameters below ¼ in.

B.S. 1728 : Part 14 : 1965 Methods for the analysis of aluminium and aluminium alloys : Part 14 Nickel (gravimetric method)

B.S. 1756 : Part 3 : 1965 Methods for the sampling and analysis of flue gases : Part 3 Analysis by the haldane apparatus

B.S. 2045 : 1965 Preferred numbers

B.S. 2569 : Part 2 : 1965 Sprayed metal coatings : Part 2 Protection of iron and steel against corrosion and oxidation at elevated temperatures

B.S. 2628 : 1965 Needleloom felts

B.S. 2999/1 to 15 : 1965 Essential oils

B.S. 3876 : Part 2 : 1965 Rope rollers and mountings for colliery track haulage : Part 2 Tapered and vertical rollers; also vertical and horizontal spindle pulleys

B.S. 3905 : 1965 6.6kV 200 ampere bolted flame-proof cable couplers & adaptors

B.S. 3915 : 1965 Carbon and low alloy steel pressure vessels for primary circuits of nuclear reactors

B.S. 3916 : 1965 Carmine for use in foodstuffs

B.S. 3917 : Part 1 : 1965 Methods for the analysis of manganese ores : Part 1 Manganese dioxide (active oxygen)

B.S. 3917 : Part 2 : 1965 Methods for the analysis of manganese ores : Part 2 Total manganese

B.S. 3917 : Part 3 : 1965 Methods for the analysis of manganese ores : Part 3 Iron

B.S. 3919 : 1965 Technical tallow and grease

B.S. 3920 : 1965 Method of certifying elevated temperature proof or yield stress properties of steel products by selective testing

B.S. 3922 : 1965 Domestic medicine cabinets

B.S. 3923 : Part 2 : 1965 Methods for ultrasonic examination of welds : Part 2 Automatic examination of welded seams

B.S. 3924 : 1965 Pressure-sensitive adhesive tapes for electrical purposes

B.S. AU 49 : 1965 Windscreen wiper motor (12 volts and 24 volts)

B.S. AU 70 : 1965 Dimensions of transmitter for speedometers (cradle-mounted flexible drive)

B.S. AU 71 : 1965 Envelope dimensions for ignition coils

B.S. AU 72 : 1965 Fuse unit

B.S. AU 73 : 1965 On-off relay

B.S. AU 74 : 1965 Hold-on relay

B.S. AU 75 : 1965 Transmission control relay

B.S. AU 76 : 1965 Hydraulic solenoid valve

B.S. AU 77 : 1965 Solenoid (pull action)

B.S. AU 79 : 1965 12 volt starter solenoid switch

B.S. AU 82 : 1965 Push switch

B.S. AU 83 : 1965 Throttle switch (insulated return)

B.S. AU 84 : 1965 Throttle switch (earth return)

B.S. AU 85 : 1965 Throttle kick-down switch

B.S. AU 86 : 1965 Hydraulic pressure switch

B.S. AU 87 : 1965 Centrifugal switch

B.S. AU 88 : 1965 Schedule of recommended ratings for light duty cables for automobile use

B.S. AU 89 : 1965 Anodized aluminium for automobile use

B.S. AU 90 : 1965 Soft solders for automobile use

B.S. CP 99 : 1965 Frost precautions for water services

B.S. CP 143 : Part 7 : 1965 Sheet roof and wall coverings : Part 7 Aluminium

RECENT PUBLICATIONS OF ISO AND IEC

■ ISO RECOMMENDATIONS

ISO/R 373-1964 General principles for fatigue testing of metals. P 19. Price Sw fr 15·00. Comprises mainly the general recommendations for the definitions of the terms used, for the preparation of fatigue test pieces, their subsequent testing procedure and the presentation of results. The recommendations are intended to apply mainly to fatigue tests under tension-compression (direct stress), bending or torsion of plain or notched test pieces of simple forms.

ISO/R 375-1964 Tensile testing of steel tubes. P 12. Price Sw fr 12·00. Applies to tensile testing of complete steel tubes or longitudinal strips of full thickness cut from steel tubes. The longitudinal strip test is not, however, usually carried out on tubes less than 0·5 mm (0·02 in) thick.

ISO/R 378-1964 Gymnastic equipment : Parallel bars. P 4. Price Sw fr 3·00.

ISO/R 379-1964 Gymnastic equipment: Horizontal bars. P 4. Price Sw fr 3·00.

ISO/R 380-1964 Gymnastic equipment: Rings. P 4. Price Sw fr 3·00.

ISO/R 381-1964 Gymnastic equipment: Vaulting horse and pommelled horse. P 4. Price Sw fr 3·00.

ISO/R 382-1964 Gymnastic equipment: Balancing beam. P 4. Price Sw fr 3·00.

These ISO Recommendations have been elaborated in co-operation with the International Gymnastic Federation (IGF). These concern gymnastic equipment the use of which is recommended for international competitions.

ISO/R 404-1964 General technical delivery requirements for steel. P 8. Price Sw fr 6·00. The requirements apply to crude and wrought semi-finished and finished steel products. Clauses on ordering, manufacturing processes, test reports, carrying out acceptance tests, mechanical tests, chemical composition, defects and dimensional tolerances, etc, are given.

ISO/R 405-1964 Aircraft tow bar connections to tractors. P 3. Price Sw fr 3·00. Prescribes dimensions of the end fittings of aircraft tow bars for connections to tractors.

ISO/R 406-1964 Inscription of linear and angular tolerances. P 8. Price Sw fr 9·00.

ISO/R 407-1964 Yoke type valve connections for small medical gas cylinders used for anaesthetic and resuscitation purposes. P 11. Price Sw fr 12·00.

ISO/R 411-1964 Common names for pesticides; Fifth list. P 7. Price Sw fr 6·00.

ISO/R 415-1965 Envelopes, postcards and similar articles cancellation area. P 3. Price Sw fr 3·00. Lays down the area on envelopes, postcards and similar articles, which is to be reserved for affixing the postage stamp(s) and the cancellation mark used by postal administration.

ISO/R 416-1965 Picture postcards: Area reserved for the address. P 3. Price Sw fr 3·00. It is recommended that the right hand half of the address face of picture postcards, measured along the longer dimension, should be reserved for the address of the addressee; the first line of which should appear at least 50 mm from the top edge of the picture postcard.

ISO/R 417-1965 Methods for determining thiosulphate and tetrathionate in processed black-and-white photographic film, plates and papers. P 12. Price Sw fr 9·00.

ISO/R 418-1965 Specification for photographic grade sodium sulphate. P 7. Price Sw fr 4·50.

B.S. CP 331 : Part 2 : 1965 Installation of pipes and meters for town gas : Part 2 Metering and meter control

B.S. CP 331 : Part 3 : 1965 Installation of pipes and meters for town gas : Part 3 Installation pipes

B.S. CP 1013 : 1965 Earthing

B.S. SP 95 : 1965 Rubber grommets (Neoprene) for aeronautical purposes

■ DRAFT STANDARDS

AUSTRALIA

988 Steel plate for general structural engineering purposes (*revision of* AS A 33-1955)

994 Hot dipped galvanized zinc coated flat steel sheets and coils (*revision in part of* AS A 20-1947)

CANADA

Z180.1 Purity of compressed air for breathing purposes

NEW ZEALAND

D 7685B Methods of measurement of building works (Parts 13 to 31)

D 8189 Size designations and body measurements for the sizing of men's ready-to-wear apparel (other than shirts)

D 8355 Motor ambulances

D 8474 Electrically heated griddles and salamanders

UNITED KINGDOM

D 65/10332 Methods of testing water used in industry : Part 4 Determination of aluminium, calcium and magnesium (*revision of* B.S. 2690)

D 65/10358 Mining terms 'TRANSPORTATION' section B.S. 3618

D 65/10387 Method for a dry heat test for electronic components (*revision of* Part 2, test BA of BS 2011)

D 65/10388 Method for a dry heat test for electronic equipment (*revision of* Part 2, test BB of BS 2011)

D 65/10389 Method for a low air pressure test for electronic equipment and components (*revision of* Part 2, test M of BS 2011)

D 65/10400 Methods of testing concrete (*revision of* B.S. 1881)

D 65/10500 Representation of punched cards of 7 bit coded characters

D 65/10501 9 track magnetic tape for data interchange recorded at 800 R.P.I.

D 65/10539 W.C. flushing cisterns (including flush pipes) (*revision of* B.S. 1125 : 1959)

D 65/10540 Methods of testing soils for civil engineering purposes (*revision of* B.S. 1377 : 1961)

D 65/10541 Linen textiles for use by hospitals and local authorities (*revision*

ISO/R 419-1965 Specification for photographic grade sodium thiosulphate, crystalline. P 7. Price Sw fr 4·50.

ISO/R 420-1965 Specification for photographic grade potassium bromide. P 7. Price Sw fr 4·50.

These specifications state the limiting concentrations and the test methods for certain inert or photographically harmful impurities that may be present.

ISO/R 421-1965 Method for indicating the stability of the images of processed black-and-white films, plates and papers. P 8. Price Sw fr 6·00. It applies only to processed photographic materials containing silver particles in an organic colloid layer, and not to dye images, tinted, toned or intensified photographs.

ISO/R 424-1965 Specification for photographic grade sodium carbonate, anhydrous. P 7. Price Sw fr 4·50.

ISO/R 425-1965 Quantity packaging of sensitized photographic materials. P 4. Price Sw fr 3·00. Specifies quantity-packaging ranges for sensitized photographic materials in sheets in association with size ranges.

ISO/R 426-1965 Classification of brasses, leaded brasses, special brasses and high tensile brasses. P 7. Price Sw fr 6·00.

ISO/R 427-1965 Classification of tin bronzes and special tin bronzes. P 7. Price Sw fr 6·00.

ISO/R 428-1965 Classification of aluminium bronzes and special aluminium bronzes. P 7. Price Sw fr 6·00.

ISO/R 429-1965 Classification of copper-nickel alloys. P 7. Price Sw fr 4·50.

ISO/R 430-1965 Classification of copper-nickel-zinc alloys. P 7. Price Sw fr 4·50.

ISO/R 431-1965 Specification for electrolytic copper wire bars, cakes, slabs, billets, ingots and ingot bars. P 11. Price Sw fr 4·50.

ISO/R 432-1965 Characteristics of construction of ply type conveyor belts. P 4. Price Sw fr 3·00. Specifies the most important characteristics of construction of ply type conveyor belts, namely, the number and the position of longitudinal joints and the number and the position of transverse joints.

ISO/R 433-1965 Marking of conveyor belts. P 4. Price Sw fr 4·50. The purpose of this ISO Recommendation is to specify the characteristics of marking of conveyor belts. It states the indications to be marked and also the dimensions and position of the marks.

ISO/R 434-1965 Lengths of Y-section V-belts (l_p=5·3 mm or 0·21 in). P 4. Price Sw fr 3·00.

ISO/R 435-1965 ISO Conventional typographical character for legibility tests (ISO character). P 7. Price Sw fr 6·00.

With a view to introducing the concept of *legibility*, ISO characters have been recommended, mainly, for making legibility mires or legibility test objects comparable to the typographic mires or test objects used in printing practices. An ISO character is a conventional typographical character, similar to printing type face, and is a regular octagon with two interior parallel stripes and accurately defined as to shape and size.

ISO/R 436-1965 Informative labelling. P 3. Price Sw fr 3·00. This ISO Recommendation aims to formulate some principles for putting informative labelling into practice.

ISO/R 437-1965 Chemical analysis of steels determination of total carbon (gravimetric method after combustion in a stream of oxygen). P 8. Price Sw fr 6·00.

of D.C. 1701 : 1957)

D 65/10542 Code of practice on composite construction in structural steel and concrete : Part 2 Beams for bridges

D 65/10557 Musical instrument amplifiers

D 65/10569 Code of practice for metal scaffolding : Part 1 Common scaffolds in steel

D 65/10570 Fixed outdoor rotary clothes driers

D 65/10571 Steel wire for fencing and steel wire fencing products

D 65/10583 Clothes-line posts (*revision of* B.S. 1373 : 1947)

D 65/10593 Continuous stationery (for general office use)

D 65/10649 Spring cylinders for yarn dyeing

D 65/10650 Methods for the removal of added matter from textiles (*revision of* B.S. 2825)

D 65/10672 Methods of testing water used in industry, determination of alkalinity, acidity and ph value (*revision of* B.S. 2690)

D 65/10791 External dimensions for vertical in-line centrifugal pumps (metric) : Part 1 '1' type

D 65/10857 Hot-dipped galvanized plain steel sheet and coil (*revision of* B.S. 2989 : 1958)

D 65/10907 Aircraft materials, aluminium alloy sheets and strips to close tolerances

D 65/10969 PTFE insulated equipment wires (silver-plated copper conductors)

D 65/10970 Copper terminal ends for crimping to aircraft electric cables with copper conductors

D 65/11054 Peat products used for landscape purposes

D 65/11067 Method for the evaluation of photographic flash guide numbers

D 65/11093 Steel pipes, fittings and specials for water gas and sewage (*revision of* B.S. 534 : 1934)

D 65/11173 Cartridge fuse-links for miniature fuses (metric sizes)

D 65/11190 Industrial scalp protectors light duty

D 65/11203 Glossary of terms used in materials handling : Part 3 Terms used in connection with pneumatic and hydraulic handling

D 65/11403 Care and maintenance of underwater breathing apparatus : Part 2 Standard diving equipment

D 65/11592 Storage and inspection in store of rubber materials and components for aeronautical purposes

D 65/12102 Timber ladders, trestles and lightweight stagings for industrial use (*revision of* B.S. 1129)

■ IEC PUBLICATIONS

IEC Publication 130-2 Connectors for frequencies below 3 MHz (Mc/s) : Part 2 Connectors for radio receivers and associated sound equipment. 1965. P 35. Price Sw fr 21·00. The design of the connectors is such that they are suitable for use with apparatus where IEC safety requirements (in particular IEC Publication 65) apply.

IEC Publication 130-3 Connectors for frequencies below 3MHz (Mc/s) : Part 3 Battery connectors. 1965. P 25. Price Sw fr 15·00. This Recommendation relates to connectors intended to mate with the connectors incorporated in or on the batteries according to IEC Publication 86-3. Requirements for plug-in pin connectors, and snap-fastener connectors are specified.

IEC Publication 192 Schedule for sodium lamps (integral type). 1965. P 7. Price Sw fr 4·50. Electrical characteristics and dimensions necessary to ensure the interchangeability and safety of sodium lamps are given which will also provide data on which a specification for the relevant ballast can be based.

IEC Publication 196 IEC standard frequencies. 1965. P 5. Price Sw fr 3·00.

STANDARDS CONFERENCE AT VARANASI

■ Achievement of self-sufficiency and self-reliance and maximum use of all available resources of raw materials in the country were the key notes of Dr T. N. Singh's inaugural address at the Conference of the Eastern Zone of Uttar Pradesh held on 9 January 1966 at Varanasi. Aimed at popularizing ISI activities in the principal cities of Uttar Pradesh, the Conference, which was second in the series, had been convened by the Varanasi Industries and Trade Association. Shri Sita Ram Jaipuria, M. P. and Chairman of the Kanpur Advisory Committee of ISI, who presided over the Conference, stressed the importance of quality in Indian industry. He urged manufacturers to make sustained efforts to improve and maintain quality through implementation of standards programmes and called for greater association of producers with ISI activities by making use of ISI Certification Mark and by becoming subscribing members of ISI.

Dr A. N. Ghosh, Joint Director ISI, explained in detail the activities of ISI and the various schemes operated by the Institution.

By a resolution, the Conference recommended that industries in the Eastern Zone of Uttar Pradesh should associate themselves with ISI's activities and implement Indian Standard specifications in their purchase and manufacturing programmes. In another resolution, the Conference observed that such of the manufacturing units and co-operative societies as received Government's assistance should adhere to Indian Standard specifications and take up ISI Certification Mark. A suggestion to form a regional committee consisting of industrialists of the Eastern Zone of Uttar Pradesh which can promote the activities of ISI in the fields of implementation, certification and membership was also adopted.

The first conference in this series was held at the Government Precision Instruments Factory, Lucknow, in November 1965. Convened by the Uttar Pradesh Industries Association, the Conference was addressed by Shri Shiv Prasad Gupta, Deputy Minister of Industries, U. P., who warned the industrialists against manufacturing substandard goods as this served neither the interests of industry nor of the country as a whole. He also emphasized the need for standardization of not only finished products but also of raw materials. Dr D. V. Karmarkar, Joint Director ISI, assured the industries on behalf of ISI that all the difficulties brought up at the Conference would be examined.

In a resolution concerning Banaras silk industry, the Conference recommended that Public Sector units should give a lead in implementing ISI specifications on raw silk yarn. In view of the non-availability of gold and silver, ISI should lay down specifications for substitute raw materials.

The Conference also requested the Central Government to set up a dye house for dyeing yarn in accordance with Indian Standards.

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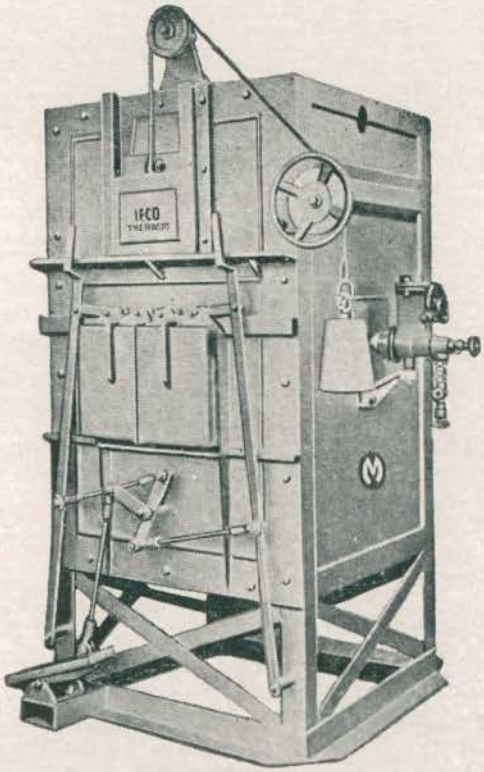

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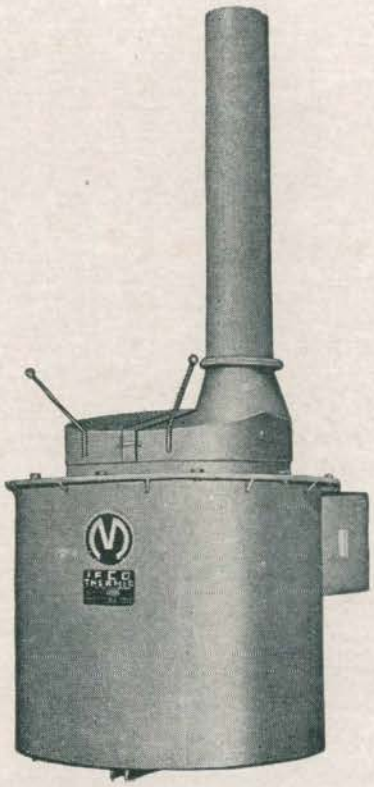

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No one likes to queue up for anything. Least of all for food. And yet when food is not plentiful, restricted but equitable distribution is the only answer. Worthy of everybody's support.

Basically the problem is that the nation does not produce enough food. Worse still, as much as a *third* of what is produced rots away before it can be consumed

The permanent solution is to grow more food. And growing more food has been given top priority in the Fourth Plan, by the end of which a 50% increase in food production is envisaged.

But more food produced may mean more food wasted. Unless we lower the rate of spoilage.

One way to prevent spoilage is to *process* and *preserve* more food and more varieties of food. A recent report issued by the Food and Agriculture Organisation of the United Nations says, "Practically all the spoilage of food that now occurs...could be eliminated by known methods of preservation."

That's why the consumer packaging industry must grow fast.

We at Metal Box believe that this growth *must* be made to happen. And to this end all our know-how in packaging, all our research and development facilities and our access to the mainstream of international packaging technology are at the service of the packers.

At Metal Box we can't grow more food. But we certainly can help save more of it. And that, you will agree, is almost as important.

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