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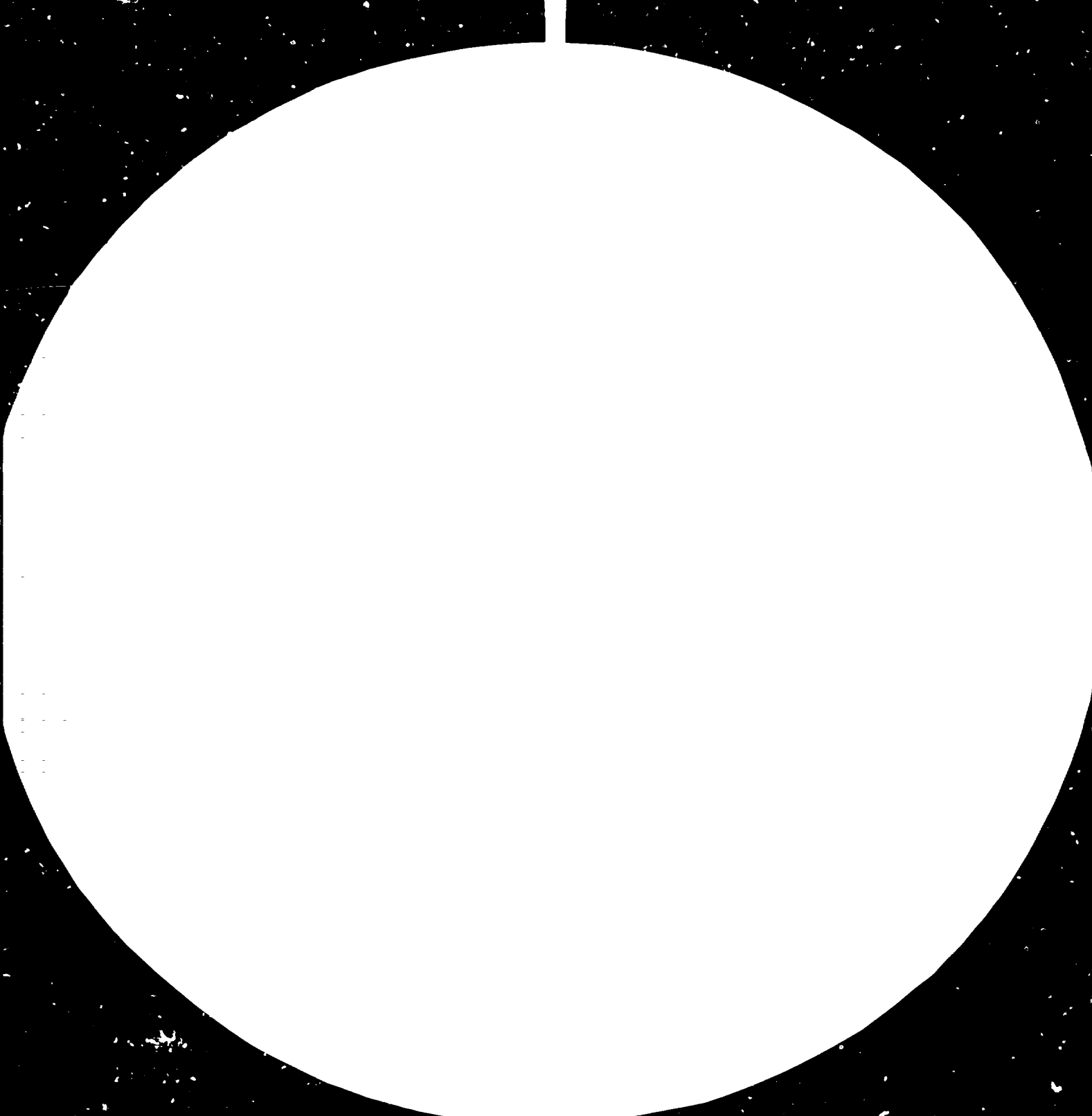

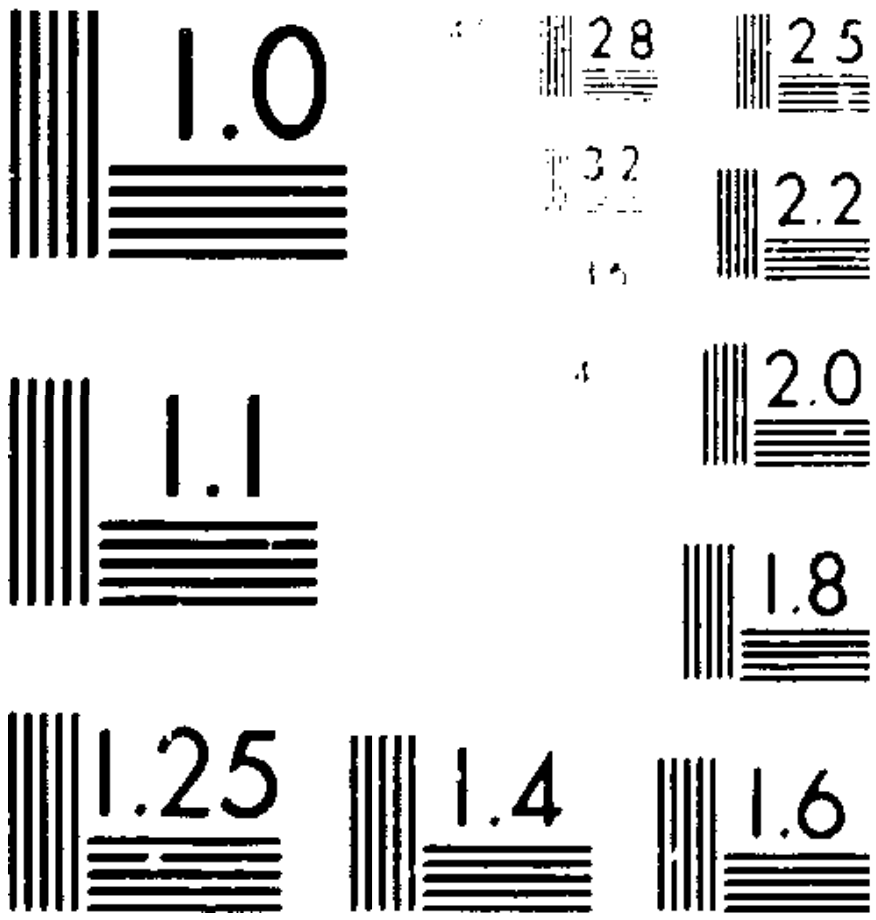
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CONCEPTUAL PROBLEMS IN STANDARDIZATION DEVELOPMENT IN THE SOCIALIST FEDERAL REPUBLIC OF YUGOSLAVIA FROM THE ASPECT OF DEVELOPING COUNTRIES*

prepared by

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Introduction

After the end of World War II, Yugoslavia was an underdeveloped agricultural country which, in addition, had undergone during the war great destruction in her modest industry and transportation system. In agriculture the damage was also great. Whole regions of the country were burnt down; tools, implements and cattle destroyed. During the war, whose goal was national liberation, the old government was overthrown and a socialist model of socio-political structure was accepted. The new Yugoslavia decided on the industrialization of the country as the way out of her underdevelopment. Such an orientation set forth on the agenda many dilemmas that the country was confronted with. First of all, one must have in mind that any underdeveloped society knows very little about standardization, as was the case with Yugoslavia. But the fact that the problem was noticed represented a guarantee that these problems would also be set forth on the agenda and be solved within the system which was in the process of its establishment. Consequently, already in 1946, the government of the then FPRY passed the Decree on Standardization which opened the process of development of Yugoslav standardization. We shall try to state in brief, in this paper, how this process has been developed as well as its benefits for the developing countries.

The position of standardization in the process of the industrialization of the country

Contemporary industrial society bases its prosperity on modern technics and technology where each detail, each operation in the process of work, each reproduction material, and product to be made, etc., must meet certain requirements regarding the quality, duration, functioning, measuring system, replacement of spare parts and mutual compatibility. The rules which determine it are called standards. Without them mass and serial production is not possible and consequently there is no high productivity of work and abundance of products on the market which meets a large number of everyday human needs. Irrespective of a socio-political system, either capitalist or socialist, standardization is an instrument without which rational and highly productive industrial production cannot be organized. In other words, standardization is an instrument and follows the building and existence of a developed industrial society. Hundreds of thousands of details surrounding contemporary man at his place of work, or residence, on a trip, or on holiday, are made according to rules mutually harmonized and without which the contemporary abundance of products would represent a burden in which our civilization would be suffocated. The classical legislature is powerless and, if considered realistically, with its inflexible and strictly formalized norms and paragraphs, unable to cover such a large domain of problems. The more so due to the fact that standards, as regulative acts, with their technical characteristics also require, apart from precision, high degree of flexibility or capability of frequent changes conditioned by the changes of technology which undergoes changes almost every five years, sometimes even more often. This is an essential difference between classical legal norms and standards which have to follow and support the development of technology, or technical progress as a whole. To be even more precise, standards are the rules or norms which establish technological order in production, and enable high productivity and up-to-date and rational organization of working processes and discipline in general.

The Yugoslav government very quickly noticed the significance of standardization in the phase of industrialization of the country. Passing of the Decree on Standardization in 1947, i.e. 1 year after the end of the war, and

establishment of national institutions for standardization prove that the significance of standardization was noticed as a phenomenon of industrial society. Now, we may say with certainty that Yugoslav standardization has given in the course of its 34 years of existence, a contribution to the exceptionally rapid building of the country and its independence, or emancipation. Without any intention of influencing the attitudes of others, we trust that our experience may be useful for the developing countries in their efforts to develop rapidly and to become economically, and in essence, politically independent from the developed industrial countries.

Development of Yugoslav standardization

In the XXth century no beginnings should be from zero. The experiences of the countries which were lucky to start industrial development beforehand, we cannot and must not literally copy, but should use these experiences and transfer them in a creative manner to our milieu as well as conditions which though different, are nevertheless, similar with regard to their tendencies. Accordingly, in Yugoslavia the question was brought forward regarding the model according to which our national standardization should be oriented. Germany, as a developed industrial country was economically and technically present in the Balkans, including Yugoslavia. DIN as the German industrial standard and VDE as an electrotechnical standard were known to one part of our technical experts who were educated in Germany or her neighbouring countries. Thanks to these circumstances, DIN and VDE served as a model as far as their technical content was concerned, and in such a way introduced to Yugoslav national standards. There was no difficulty in taking over technical solutions of German standards considering that the standards concerned were elaborated on the measures of the metric system, while one must bear in mind the fact that at that time international standardization was also in its infancy and with a modest number of international standards, primarily in the field of electrotechnics. In such a situation any solution was better than nothing, the more so as German standards were really at an enviable level and could serve as a model.

The question which here deserves special attention is the seriousness when taking over somebody else's solutions. Our experience shows that the use of other countries' national standards has its reason and certain weak points. In our case our experts – standard makers, used to take over almost without any amendments some German standards. Somewhere smaller or bigger corrections were made, but the contents and the manner of the presentation of DIN and VDE were fitted into the bases of our national standards. It helped us to elaborate several thousands of JUS in a relatively short time. However, it happened that German standards were established not only in our national standards but through them in technical regulations and even in laws regulating technical matters. Due to such a development of standardization, the Yugoslav economy imperceptibly became dependent of the German economy. German industry, thus, was introduced to Yugoslavia surreptitiously and acquired a privileged position in relation to all other industries, and started to eliminate without any difficulties the competition of other countries and gradually to impose exchange conditions which were like its privileged monopoly position; this was very often opposed to the national interests of the Yugoslav economy which was developing very rapidly at that time. Besides, our engineers and labourers got used to favoring German technical solutions and giving preference to equipment of German manufacture, particularly when equipment of newly built factories was in question. Our degree of dependence upon German technology and the payments deficit of Yugoslavia in trade exchange between the two countries are only the consequence of certain relations to which, in this very detail, standardization gave a negative contribution. If the relations between the two countries are looked on as a whole they are really at an enviable level.

The strongthening of Yugoslav standardization personnel, mainly with experts who had had good practice in production on various duties primarily in big enterprises, contributed to the affirmation of JUS, firstly

with our personnel employed in production, faculties, institutitions and in state management. This affirmation was acquired as the consequence of noticing the above mentioned weaknesses, the use of the knowledge and experiences of all developed national standardizations and greater reliance on the international standards. When speaking of the use of the other countries' experiences one immediately questions its own contribution to the development of its own standardization. Standardization is a very expensive activity and it must be the superstructure to previous investigations and verifications in practice. Therefore, one may freely say that no country has sufficient strength to elaborate all possible standards alone without reliance on the experience and knowledge of other countires. This is exactly one of the important reasons for which cooperation in the field of standardization very quickly and easily passes national borders and acquires international character. In Yugoslavia we have noticed this relatively quickly but we have also noticed the fact that other people's solutions should be analyzed and many of them should be checked up in one's own practice. In our country this is done by our enterprises either in their own laboratories or under production conditions, or it is done by the faculties and institutes. They are all interested in the matter and the results of their check-ups are forwarded to the Federal Institute for Standardization which considers it at its commisssions for the elaboration of standards. It refers also to a case when we pass a standard for which we do not have a model and consequently, we must give by ourselves all solutions and tests. We use experiences of developed standardizations, primarily ISO and IEC, but we try to check-up certain parameters prior to their incorporation in JUS. Nowadays, Yugoslavia, has somewhat over 9,000 Yugoslav standards and many more standards of big technical systems such as the post, telegraphs and telephones, the railways, electricity generating, the Army, the union of shipbuilding yards and numerous big and complex economic organizations from all branches of the economy. All these standards are in their essential elements in conformity with JUS and make sub-systems of a unified system of Yugoslav standardization.

Standardization and the State, standards and regulations

The relations between standards and classical regulations passed by the State are regulated, varying from country to country. Nevertheless, if we separate the essential difrerences from the less significant ones, it will lead to two basic solutions which determine the function of standards in the system of classic regulations between standards and regulations in regulating significant questions of a technical nature which put the development of science and technology on the agenda. Therefore, division into two opposite poles is not possible here, since there are intermediary solutions. I hope that I shall not be criticized if I simplify some of my views due to limited time and space.

The developed industrial countries started to build their industry much earlier. This is of great importance both for their development in general and for the development of standardization. In these countries standardization appeared primarily in the role of discipline which secures rationalization in the process of production, particularly when introducing new technology, when individual production was replaced by mass and serial production. Standardization emerged out of this process. Without standardization of raw materials, production processes, measures and dimensions, it is impossible to secure a certain level of quality, product functioning, replacement of components, mutual compatibility and other properties of industrial goods. Without standardization this production would be very expensive and goods at prices inaccessible to a mass of potential buyers. At the beginning, standardization had exactly that rational function in fighting for the reduction of production costs and for lower prices of industrial products. The next step or task of standardization of the developing countries was to enable the breakthrough of industrial goods from one country to another. Elimination of technical differences between domestic and imported goods was a prerequisite for the extension of markets, the increase of profit and a continual increase of industrial capacity. Alongside this we should remember that these were countries with a socio-capitalist system whose industry,

in essence, was established on the private character ownership of capital. Therefore, national organizations for standardization were established by big capitalist industry with the view to solving mutual problems. Such institutions are non-government organizations and consequently, standards passed by them did not have an obligatory character. They were binding only for those organizations which both elaborate and pass them, cooperating with national organizations for standardization. This is the view from the formal, legal standpoint; for whom standards are binding, and how they are to be applied.

The problem of standardization in capitalism is not as simple as it seems at first sight. First of all, in the developed industrial countries was developed a market on which the law of supply and demand governed, alongside an abundance of goods and rigorous competition. Under these conditions of abundance of goods and keen competition, whose creators are the very owners of big capital and at the same time the establishers of national standardization, formal compulsion of the State is not necessary for standards to be applied. Economic compulsion is much stronger than any other. One who does not respect agreed standards, under the economic pressure of the stronger ones, is removed from the market by bankruptcy or ransom of that capital. It should not be forgotten that large-scale industrial capital, united with finacial capital, is very well organized and capable of eliminating the "naughty children" of its system, either by competition, or by refusal of loans, or by the support of State administration and the like. The stronger are merciless. Lately, the capitalist countries have also introduced the capitalist state into this sphere keeping formally to their dogma of "the inviolableness of private property". This entry of the country surreptitiously appeared at first in the field of so-called technical regulations which essentially regulate the same problems as standards do, but whose primary task is protection of health, protection at work, protection against big damage which may be caused by explosions of various kinds, the use of electric energy both in production and in residential or other buildings for mass purposes, up to the control of radioactive resources, fire, and protection of the natural environment. This domain of State intervention has been extended in the last few years. State regulations refer more and more to standards so that from the formal side also such standards are becoming obligatory and fit into the system of State regulation of those questions with which the „old" classical State did not interfere. As a part of this process of connecting modern capitalist states and national institutions for standardization, is the participation of the states in financing standardization, in granting many facilities to institutes of non-profit-making character. Thus we have reached the point where contemporary standardization in the developed industrial countries with a capitalist system, is neither private nor State, but contains the elements of both. Nowadays, these are practically social services of general interest whose work is supported by all factors of contemporary society.

All the above stated was necessary with the view to easier understanding of Yugoslav practice in the development of standardization; the problems of the other developing countries are very similar. Yugoslavia, at the time of the establishment of national standardization was a poor and underdeveloped country. There was a general shortage of goods on the market; even food was bought on coupons as well as many other articles of consumer goods. In such a situation, each product that was made and was introduced onto the market had a buyer and nobody cared about the standard or quality. The motto "take what you can" reigned. Classical elements of the market, such as supply and demand, fixed prices, competition and the like, practically had no influence. The State was compelled to interfere in the matters which were within the range of her activities under normal circumstances. Nevertheless, a citizen consumer had to be protected from unnecessary difficulties which objectively emerged under such conditions. National standards as the new phenomenon in production and marketing of goods, were insufficiently affirmed and consequently by-passed. Apart from their basic functions in production, they extend their influence and take over the function of systematic fight for a certain, socially acceptable quality level, as an instrument of protection of citizen consumers. Whether under such circumstances a standard should be obligatory or optional for applicaton is no longer an academic question. It is a very significant question of everyday practice – whether standards are going to

be one of the elements of economic policy of the country, which has chosen the way of accelerated development in general, particularly industrial development, or whether they will not be one of these elements. An opinion which has justifiably prevailed is that standards are considered to be elements of economic policy of the country and that their application must be obligatory.

As the primary task of standards is rationalization and promotion of production and marketing (in our system they have other functions as well), it was questioned how to elaborate them, according to which procedures they should be passed, whether to elaborate and pass them within the State's management as classical State acts, or to democratize the procedure by including in it the enterprises concerned, scientific institutes and consumers. Due to the use of standards for many purposes the opinion prevailed that the procedure of the elaboration of standards should be entrusted to the experts concerned in economics, science, and other organisations, and that the state should be the organizer of this activity and bear the expenses of printing and publication of standards. In such a way Yugoslav standards were elaborated and passed as agreed documents while respecting various interests of the participants in the elaboration of standards but once they are published the State supports them with all its attributes, such as State Inspection, Courts, Prosecutor's Office and the like. Violators of the standards' provisions are responsible as for the violation of any other state regulation. The procedure of standards revision is also democratic and may be initiated by any organization concerned. This has introduced elements of flexibility and relatively easier adjustment of standards to the rapid changes of technology which the standards must follow if we want to secure their positive influence on the development of the economy. In practice, there are problems related to the delay in the final part of the activity. But these problems are present wherever the state mechanism has any influence.

When considering the problems of the state and standardization, and regulations and standards, or vice versa, some of our problems should be pointed out, at least as we solve them though we believe that similar repetitions will take place in other countries.

New Yugoslavia has decided for a socialist type of state structure. Industry, trade, transportation, and banking have been nationalized. The new state has a sequence of new functions which classical capitalist states did not have before. The new obligations of an essentially new state, had to be responsibly and effectively fulfilled. One of these obligations was the establishment of the position and role of standardization in our system. The question was where to locate national organizations for standardization considering that standards have become instruments of economic policy of the country in which all the main wealth of society, except land, and some tertiary activities, have become social property. In that time a logical decision was reached that standardization should be established as a state institution. With regard to that we already had the practice of other socialist countries of Eastern Europe, which was applied to our conditions, too. In the period that followed, many developing countries acted in the same manner which has mainly proved to be justified. At this moment, it is essential, to draw a parallel between standards and technical regulations. By the Decree on Standardization of 1947 it was regulated that standards and technical regulations are passed by the Federal Commisssion for Standardization, having in mind the fact that both acts cover the same problems only form different aspects, and the fact that both acts are formally passed by the state bodies. The difference is in the fact that in the elaboration of standards a primary role is played by cooperation with the economy and science, while in the elaboration of technical regulations, which are by -- laws of the state, a primary role in cooperation is played by competent ministries, subject to the field the regulation is passed for. Such an approach to the problems was fully justified under our conditions.

The practice which followed the passing of the Decree on Standardization started to copy Western European countries' practice, primarily Germany. Competent ministries took on themselves the passing of regulations, while standards were passed by the Federal Commission for Standardization. A sequence of misunderstandigs which were very unpleasant for our enterprises arose from such a practice. The same problem was solved by a stand-

ard in one way, a technical regulation of one ministry in another way, and the technical regulation of another ministry in a third way. In the hierarchy of the state bodies and acts passed by them, standardization, as a rule, had the worst of it. The disunity of technical regulations negatively affects the economy and causes damage. Consequently, the latest Act on technical norms and quality norms, of 1974, transferred this subject-matter to the competence of the Federal Institute for Standardization, as our new national organization is officially called. The Standardization Act of 1977 worked out the whole matter in detail and unified it, only the differences in the procedure of the elaboration of standards and technical regulations remained as they were prescribed in 1947.

Up to now, in our system both standards and technical regulations have been obligatory and treated as by-laws. With the development of the economy, the number of standards increases rapidly, new fields in production are opened, technology changes frequently, and the need for revision of the old standards and the passing of the new ones becomes bigger. This process is very difficult to follow, especially if the standards have the formal strength of by-laws from the moment of their passing. Now, practical reasons make us consider whether, at this level of development of our economy (Yugoslavia is today a medium developed country) it would be more suitable to pass standards as non obligatory tecnical acts and make the whole system more elastic. As in our country standards and technical regulations are formally passed by the same institution, there are no difficulties in some standards being declared wholy or partially an obligatory so-called principle referring to a standard. It would enable the economy to take over international standards as national standards more easily, while the legal system would not be disturbed. In that case standards would not be a priori by-laws and would not have to fit into the forms valid for the regulations. This is a subject of further analysis.

In any case, our practice has proved that it is useful in present circumstances for the elaboration and the passing of standards and technical regulations to be united in one place. It secures the unity of systems of all regulative documents with technical contents, which is very important for the economy of the countries that are developing rapidly and which have to overcome in a short time what the developed countries did in much more time.

Some aspects of the multi-disciplinary nature of standardization

It is not necessary to prove to anyone that standardization is a multi-diciplinary activity. It is well-known. At the beginning of this paper it was stated that the primary task of standardization is rationalization of production, increase of productivity and reduction of the costs of dealings which enables reduction of product prices, and consequently, an augmentation of the number of buyers of contemporary property. All this leads to better conditions for the quality of life of contemporary man. We have discussed the economic aspects of standardization several times. Unfortunately, we have not carried out such an analysis as there is still no reliable methodology for this kind of operation, and current activities regarding the passing of standards have engaged our strength and means available to the maximum. We have, in fact, relied upon (and considered reliable) the data on economic aspects of standardization which were obtained in USA, India, G. Britain, USSR, France and some other developed countries. All these indicators are very stimulating for standardization. As an example, we are taking one French datum that each franc invested in standardization earns 20 franc of income. Other indicators are also similar. Just because of this lack of strength to cover all the problems, we have delayed these analyses for later, using till then the results that others have achieved.

In our system the problem of consumer protection is an essential element and task of standardization. Insufficient production of some goods affects the producers in such a way that they try to reduce the quality of those goods without an adequate price reduction. In that manner, national wealth overflows from the pockets of

working people who have earned their money working honestly into the pockets of those who warn by their idleness and the shortage of some goods on the market. In our system such behaviour is considered to be asocial; and standards as instruments accepted by all concerned define the socially justified quality which is compolsory for everyone. An arbitrary deviation from standards to the lower quality is not only a moral violation but also a legal one and in our system fines are pronounced by judges or some other protection measures are taken.

Protection of human life and health is one of the essential functions of standardization. According to the beliefs of our people the sale of contaminated or in any way harmful nourishment represents a criminal act towards man. This belief has found its position in our legislation, too. Standards define which qualitative and health conditions articles of nourishment, clothes, footwear, sanitary and all other goods which are in immediate contact with man must have. It has been determined precisely which additives can be used in these cases, in which percentages, and which must not be used at all. The same thing applies to the buildings, plant and equipment. Standards and technical regulations define the notion of the safety of people handling these objects, the method of maintenance and protection not only of immediate persons handling these objects, but also the way of protecting buildings and their environment. It refers equally to both residential and office buildings, or to a traffic artery, a bridge, a warehouse, or transport of easily flammable or explosive materials, to fire or a medical device which uses radioactive isotopes. The universal multidisciplinary effect of standardization is indispensable.

They defence capability of the country is one of the tasks of any society in which the contribution of standardization is not to be underestimated. They defence capability of a country does not depend only on the number of soldiers armed, on the number of planes, guns, tanks and the like. In peace, without standardized, typified and unified parts, machines, equipment, possibilities of standard replacement of parts, raw materials, semi-products and finished products, all the elements of telecommunications, traffic and vehicles etc., it is impossible to wage a long-term national war, or to resist the contemporary war techniques of a possible aggressor. The prepared war technique is quickly destroyed in the first clashes. If standardization has not secured the possibility of replacing parts, and using other materials, the slightest thing can prevent the technique from being used in battle, and consequently it becomes a mass of useless metal. Today, for this reason, all the Armies of the world give extraordinary importance to standardization.

It si impossible to list all aspects of the activities of standardization in contemporary society. Even all the above mentioned as an illustration shows well that contemporary civilization with its prosperity based on the development of science and high productivity of technology, cannot either survive or function without standardization. Bearing this in mind, we, Yugoslavs, have worked out a concept of the Policy of Standardization in Yugoslavia. This document was put forward to the public and finally adopted by the Yugoslav government. We believe that it would be useful if other developing countries would also work out their own concept of standardization policy in their own countries. Without this concept it is very difficult to comprehend the entirety and select the priority problems which would primarily be treated by national standardization.

The relation of Yugoslav standardization towards international standardization

Standardization with its character and its aims is really an international discipline which does not know classical borders and does not make any differences between socio-political systems. Therefore, we Yugoslavs consider this region to be very suitable for the development of cooperation between the countries and people. However, this does not mean that standardization cannot be used also for aims which are opposite to its character. This is the second problem whose consideration is not the subject of this paper. When considering the problems of cooperation

of Yugoslav and international standardizations, our attitude is positive and we support all forms of cooperation among all the countries and people in this field. The more this cooperation is developed the better conditions are for the development of goods exchange, industrial cooperation, circulation of knowledge and technology. One who follows carefully the development of international standards is in a position to estimate the trends of contemporary science and technology. This information is very precious for a person that knows how to read them and decipher it. We shall here discuss two problems which we Yugoslavs have carefully followed by cooperation in international organizations for standardization.

The first problem is the use of international standards as a base for the elaboration of national standards. In our opinion, it is of indispensable assistance to the developing countries and the shortest way for contemporary standardization to be elaborated. Certainly, all solutions of international standards cannot be mechanically taken over. It depends on the degree of the development of each country to what it take over and fit into national standards the solutions contained in international standards. But it is extremely important material whose genuine value cannot be objectively determined. The knowledge and experience of a large number of the best world experts have been abridged in them. Along with this, there is no danger of getting into the situation of an exaggerated dependence upon any national standardization.

The second problem that we Yugoslavs have paid exceptional attention to is the strictness of requirements which are fitted into international standards. It is neither a secret nor a novelty that the developed industrial countries have the main word in international standardization. However, it has its both positive and negative points, and one must handle it very carefully. The highly developed countries usually try to fit into international standards those technical parameters that suit them best. In that manner the priority of the developed countries in international trade is legally secured, and it often represents insurmountable technical barriers for the developing countries. When this is combined with other measures of protectionism, this problem may get exceptionally unsuitable dimensions for the development of these countries, their independence and affirmation. Due to this fact, the developing countries must be present in the activities of international organizations. As financial problems of developing countries are often an obstacle with regard to the physical presence of their representatives in the work of ISO and IEC. written papers as the inevitable method of cooperation are of great value if the experts working on the elaboration of standards carefully follow the work in this field which they cover. A clerical relation ship towards international organizations is very dangerous for the developing countries. Therefore, it is particularly important to include in the working bodies of international organizations experts working in big enterprizes of some countries, while the national organization for standardization has the primary function of an organizer. This also varies from country to country due to the number of experts some countries have at their disposal, as well as the expertise or understanding of these people. We shall not enter into other aspects of international cooperation in the field of standardization. It is a great pity that the developing countries do not use to any great extent the possibility of mutual consultations either on a bilateral base or arranged by ISO and IEC.

Instead of a conclusion

The civilisation of the XXth century in which we are living owes its prosperity to the sudden development of science and technology, so that the developed societies of our planet have the characteristic of an industrial society. Building of the so called industrial society with an abundance of products and enormous material possibilities is not possible without the discipline called standardization. Standardization is produced by and follows industrial society from its beginning to its transfer into a post-industrial society. In order to make this process of development more rapid, more effective, less painful and more human it is indispensable to fit into all its pores this, in essence, discipline called standardization, as much rational as it is human.