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TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 561

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INTERNATIONAL AFFAIRS

SOCIALIST COUNTRIES PARTICIPATE IN NUCLEAR RESEARCH

Prague TRIBUNA in Czech No 32, 10 Aug 77 p 13

[Article by Jiri Javurek: "Institute for the Future"]

[Text] Just a year ago the Joint Institute for Nuclear Research [SUJV] in Dubno--the first international scientific center in the socialist countries--celebrated its 20th anniversary. During this period it had become one of the leading scientific centers in the world. Much of its research work found application and helped in the development of the socialist economy, energy, medicine, etc.

The Beginnings

On 26 March 1956, government delegates of the participating countries signed an agreement on the organization of the new institute in Moscow. The charter members were Albania, Bulgaria, Czechoslovakia, the PRC, DPRK, Hungary, Mongolia, the GDR, Poland, Romania and the USSR. In the fall of 1956 the Democratic Republic of Vietnam joined. In the beginning of the 60's Albania ended its participation in the joint research and in 1965 the PRC also recalled its scientists.

The government of the USSR, which had initiated the establishment of the institute, transferred to its control two scientific research centers of the USSR Academy of Sciences in the town of Dubno not far from Moscow. There, Soviet scientists had been working ever since 1949 on a proton accelerator--the synchrocyclotron, and were completing the construction of the proton synchrotron accelerator. Both worksites and their equipment became the base which enabled the international staff of scientists of the new institute to begin at once their experimental researches in the field of high energy.

The Institute Today

During the time of its existence, the institute has changed considerably and expanded a great deal. Scores of buildings were erected--laboratories,

workshops, energy complexes, etc. Some of the laboratories, considering the number of scientific teams, could themselves be institutes. Over 6000 workers work in the development and repair shops, which indicates quite a big plant. Among the 900 scientific workers there are five academicians and eight corresponding members of the Academy of Sciences, 90 doctors of sciences and 380 science candidates.

The results of the research carried out by the scientific workers of the SUJV became authoritative in the world and obtained general recognition.

A number of new ideas and methods underwent further tests in the institute itself as well as in scientific centers of many countries. For example, a considerable part of the tests carried out on the proton synchrotron devoted to identifying the origin of "strange particle" in energies up to 10 billion electron volts. In recent years work on the proton synchrotron contributed to the development of a new direction in scientific research--relativistic nuclear physics, providing the possibility of studying nuclear collisions, the speed of which approximates that of light.

In effect, scientists have been observing for over 20 years now nuclear spectroscopic isotopes resulting from radiation of the targets in the synchrocyclotron. SUJV physicists discovered over 100 new isotopes in the course of these researches. A broad program of observation is being carried out by scientific workers of the institute on the largest Soviet accelerator, in which the energy of the protons attains 76 gigaelectron volts (GeV), installed in the Serpuchov Institute of High-Energy Physics of the USSR Academy of Sciences. A two-meter chamber, which the scientists call "Ludmila" among themselves and which contains liquid hydrogen, is irradiated by beams of this accelerator. Workers of our Institute of Physics of the Czechoslovak Academy of Sciences also had part in this development.

International Cooperation

After activating an even more powerful proton accelerator, with 400 GeV power, in Batavia in the United States, one of the first researches, which had been carried out jointly by physicists from Dubno and Batavia, was directed at scattering the protons and deuterons into small angles. The results of the test revealed important findings about the structure of the nucleons and manifestations of nitro-nuclear forces.

International scientific cooperation has reached, in the more than 20 years of the institute's expansion, various forms and year by year it increased. Today the international collectives of scientific workers and technicians at the institute is involved in practically all the chief aspects of present day physics. Also taking part in the work of the institute are scientists from India, Finland, Belgium, Austria and other states.

The SUJV is developing its scientific contacts not only among member states of the institute but also with physics centers of other states and international organizations. The institute is successfully cooperating with the

European Organization for Nuclear Research in Geneva (CERN), with the International Center of Theoretical Physics in Trieste, with the Niels Bohr Institute in Copenhagen and its scientific workers, together with American physicists, carried out a number of experiments on the accelerator at Serpuchov as well as in Batavia.

Our People at Dubno

Present day Dubno is a modern city of several thousand inhabitants, the majority of whom have direct or indirect relations with the institute. A number of scientific workers from the physical and chemical fields from Czechoslovakia live and work there, as well as many technicians. Most of our citizens work in the laboratory of high energy, in the nuclear laboratory and in the laboratory of neutron physics. A smaller number work in the laboratory of nuclear reaction and in several others.

Perhaps many people think that studies of this type, the exact measurement of elementary particles of matter which at present are of no direct benefit to humanity and are extremely costly, are of no general significance. However, it is a question of identifying the basic natural laws of matter. Today we know how the atoms in it are interconnected but we do not know their exact nucleus. By gradually extending our knowledge of matter it appears that even the proton and neutron are not the smallest basic particles but that they are composed of other even smaller particles.

It can be said with certainty that the enormous investments in the SUJV will be returned to mankind in the future--primarily by finding ways to new sources of energy. So it is the future that is at stake, the existence of mankind even when supplies of coal, oil or other fossil fuels will be exhausted. And it is in this future, which is also important for our nations, that our scientists have a share.

8491

CSO: 2402

ALBANIA

CONSTRUCTION OF HYDROELECTRIC POWER PLANTS DISCUSSED

Tirana ZERI I POPULLIT in Albanian 23 Jul 77 p 3

[Article by Prof Petrit Radovicka: "Successes and Problems of Science and Technology in Hydro-Energy Construction"]

[Text] For the development of energy, the party has from the beginning defined two main orientations: first, the development of energy must advance at a faster rate than the development of the other sectors of the economy; and, second, the development of energy must be based primarily on the exploitation of the country's hydro-energy reserves.

The studies made thus far have shown that, thanks to a number of characteristics of the country's natural conditions, our potential hydro-energy reserves are many times greater than those of all the European countries (with the exception of Norway) both per capita and per square kilometer of territory. Moreover, the degree of technical possibility of exploitation of these resources is higher in this country than in any other, while the economic profitability is much greater. Almost without exception, all the hydroelectric plants built in the last 20-30 years in Europe have a volume of operations per unit of power production that is at least two or three times greater than our Drin hydroelectric plants. Another very important characteristic of our hydro-energy reserves is the fact that they permit a much higher regulation of the runoff. With the full inauguration of the Fierze hydroelectric plant, the power to be furnished by our hydroelectric plants will no longer undergo any change from winter to summer. Construction of the Skavice hydroelectric plant will have the effect that even in case of a very unfavorable combination of several dry years one after the other the power from all the plants that can be built on all our rivers will not drop more than 10 percent below the multi-year average. The ability to regulate the power from all hydroelectric plants in this way on a national scale is not possessed by any other country in the world.

The high rate of construction of hydroelectric plants has set important tasks for the workers, technicians, engineers and other specialists working in this field. But still greater tasks were assigned them by the

Seventh Party Congress. The Sixth Five-Year Plan provides, among other things, for the completion of construction on the Fierze hydroelectric plant and for the commencement of construction of the Koman hydro-plant. Fulfillment of these tasks demands a further rise in the scientific level of work, the generalization of experience, and the deepening of theoretical and experimental studies.

A radical turnabout in assimilating science in the field of hydro-energy construction was effected after the directive given by the party back in 1957 that hydroelectric plants should be studied and projected in our country mainly with our own forces. A very great source of training for our cadres has been and continues to be the study and construction of the Drin, Vau i Dejes and Fierze hydroelectric plants, for which they have also had the valuable assistance of Chinese specialists. The plants on the Drin, especially the Fierze station, are hydro-plants of major European and world caliber in many parameters. Fierze represents a European record, and in many others it is near those records. The problems that have been or are being solved for Fierze are among the most difficult for today's science and technology in the field of hydroelectric construction. Of the same order and, in some cases, still bigger will be the problems for the Koman plant, and especially for that of Skavice, which will be studied and projected entirely with our own forces.

The first step in studying hydroelectric plants consists in hydrologic and climatic studies, which furnish the necessary data for projection, such as climatic data, the runoff regime, solid runoff, and so forth.

Especially important and delicate is the study to determine maximum runoff, on the basis of which the discharge works are projected. The calculations for both the Koman and the Fierze plant must be further refined by using the methods of analysis of the formation of plots, the methods of the unit hydrograph, and more thorough statistical methods. The Fierze project provides for the necessary elasticity of the solutions adopted, which permits the respective corrections to be made.

In all our hydroelectric plants we have studied in detail and on a satisfactory scientific level all the geological, hydrogeological and engineering problems (the physical-mechanical properties of the formations on which they are erected or which are connected with the hydrotechnical works have been determined, and a study has been made of the qualities of the formations with regard to water filtration, the karst phenomena and their dangers, the degree of friability of the rocks, the degree of the development of the tectonics, especially the danger of new tectonics, slippages, and so forth). All of these problems have been of especially great importance for the Fierze plant because the Fierze dam and other works with very large dimensions demand especial precision in determining the physico-mechanical indicators.

The geological studies on Fierze, as on the other hydroelectric plants, have been successful, but they have also had some shortcomings. For the

Koman plant, they must be made more thorough, at a higher scientific level, and particularly in due time. The studies on Koman have therefore begun in time and are relatively more advanced than on Fierze. After completion of the main part of the Koman operations, it is necessary to begin the studies on the Skavice plant so that these may be done in due time, with the necessary thoroughness, and may precede the operations of projection and construction.

A special problem in the framework of geological studies is the seismological study side, both as to the seismicity of the region and to obtain the data needed to calculate the project, and also to follow seismic activity in the future, since it is now known that the creation of large and deep lakes like that of Fierze is accompanied by an increase in seismic activity. For this reason, the requisite seismic stations have been erected in the area of the Fierze lake.

Another field of hydro-plant study is the determination of the power of the plant, the number of turbines, the water level at the upper and lower sides of the plants and their fluctuations, ways to exploit the lake to regulate the power of the plant and coordinate as well as possible the maximum production of energy with the highest water improvement effect, by increasing the summer runoff of the river, especially in the case of the Drin, and by lessening the possibility of flooding in the plains areas. Under our special climatic conditions, and in view of our energy system, consisting chiefly of hydroelectric plants, these problems have demanded the elaboration of new and original methods of study.

An important field of hydro-plant study is the projecting of the hydro-mechanical part, the electrical part and the hydrotechnical equipment. All of these problems have been solved on a high level in our hydroelectric plants, in accordance with the latest world technology. They must continue to be further deepened by taking advantage of the experience gained and following the development of new world technology step by step in order to install in our plants the newest layouts and apparatus, but only after these have been tested and their total efficiency has been demonstrated.

All the fields mentioned above are important, of course, but nevertheless the main study problem in hydro-plants is the hydrotechnical works, especially the dams. In this field, our science and technology have come very far. Especially large and heavy are the hydrotechnical works in the Fierze plants. Its dam, which is being built with a clay core, with gravel and stone, is the highest dam of this type in Europe. It should be mentioned that it has not been more than 20-30 years since dams of this type, with this height, were first built anywhere in the world. In general, the technology of the construction of the Fierze dam was determined after 5 or 6 years of study in our special earth-moving machine laboratories and directly in the field on experimental dams. Thoroughgoing studies were also made for the first time in our country to get the parameters and determine the technology of rock-fill dams. We must make still more

thorough studies of earth-fill dams. For this purpose, computer technology making it possible to compute more rapidly and thoroughly must be widely introduced in the calculations of stability.

The other works in our hydroelectric plants are also very large, especially those at Fierze. The towers of the works at the entrances to the discharge tunnels and those of the intake tunnels reach great heights. The tunnels bringing water to the turbines are unique, being the largest in Europe and among the largest in the world with regard to dimensions and internal pressure. The study and construction of such works have been mastered on a good level. But as for the Koman hydroplant, which will have tunnels with larger dimensions than those of Fierze, the studies concerning computations too, but especially on the execution of the operations, must be developed and further deepened. I believe that in order to perform these tasks preliminary experimental work must be done in time, since during the process of construction it is difficult to solve these problems and to master the new methods of work to a satisfactory extent.

In hydrotechnical works, a particular matter for consideration are the special cementing operations to reinforce the rock formations and create curtains against infiltrations both in the rock formations and in the gravel formations. The cementing of the rock formations and the creation of curtains in them have been mastered in time and do not constitute any problem under normal conditions. The data from the special apparatuses installed in the curtain at the Vau i Dejes hydro-plant show that after having been in operation for 6-7 years it is still in quite normal condition and fills the conditions provided for in the project.

The barrier against infiltrations into gravel at Fierze have been used only in temporary works, whereas at the Koman hydro-plant they will be used even as more reliable works than at the Vau i Dejes plant.

The technology of cementing rock formations must be raised to a higher level for the Koman plant, and especially for the Skavice plant in view of the chemical and mechanical activation of the solutions, in order to increase their penetrating power, thus making the curtains more effective and, at the same time, cheaper.

Methods of study on reduced models have been widely used in studying the hydraulic problems of hydro-energy works. The studies in the field of hydraulics are done in the respective laboratory of the academy in collaboration with the hydraulics chair of the university. The quality of the studies has been good. This is shown by the fact that the works studied operate normally and have the anticipated characteristics. A task for the future is to raise the qualitative level of these studies, especially with regard to those on high velocities, by making them in a vacuum; and so forth.

But while we have achieved important successes in the field of studies with reduced models in hydraulics, we have not increased and put into

practice studies on models of designs from the static aspect, since the necessary perseverance has been lacking both on the part of the study and projecting institutes of the Ministry of Construction and on that of the respective chairs of the university. I believe that it is appropriate to set up also a laboratory for static modeling and to put the respective studies into practice.

The important successes in the studies on hydro-energy construction have been achieved thanks to broad collaboration between the respective institute of the Ministry of Construction, which does the main work on these studies, and many institutions of the Academy of Sciences, other study institutes of construction, some chairs of the university, the General Directorate of Electric Plants, and particularly thanks to a close cooperation with the large number of engineers, technicians and executing workers, who have made a valuable contribution directly to the study of many particular problems and, at the same time, have aided in discussing the choice of the best alternatives, giving their opinions and making suggestions and proposals which have radically improved the quality of the various choices. Simultaneously with this wide "massization" of study work we have achieved further qualification of the projecting cadres by quite thorough specialization. Important tasks face our specialists in further raising their scientific, technical and practical level and in increasing the number of cadres for certain important specialties, so as to cope with the demands of the times and the great and difficult tasks set for us by the seventh party congress.

10002

CSO: 2102

BULGARIA

SCHOLARLY ACHIEVEMENTS OF NAVY CAPTAIN EMIL STANCHEV

Sofia VOENNA TEKHNKA in Bulgarian No 7, 1977 p 12

[Unattributed biography of Capt First Rank Docent Engineer Emil Stoyanov Stanchev]

[Text] The Higher Certification Commission of the Council of Ministers of the Bulgarian People's Republic has awarded the scientific degree of Doctor of Technical Sciences to Captain First Rank Docent Engineer Emil Stoyanov Stanchev of the N. Y. Vaptsarov VNVMU [Higher People's Navy Academy] in Varna.

Stanchev was born in Odurne Village, Pleven Okrug, in 1930. He graduated from the N. Y. Vaptsarov VNVMU in Varna, and the VMEI [Higher Machine-Electrical Institute] in Sofia. BCP member since 1955. Member of the Faculty of N. Y. Vaptsarov VNVMU since 1953. In 1966 he was elected docent on Theory of Machines and Mechanisms. He defended successfully his candidate dissertation and was awarded the scientific degree of candidate of technical sciences in 1939. For many years he headed the chair on Technical Mechanics at the VMEI in Varna and the section on Mechanical Installations, Mechanisms and Systems at the Shipbuilding Institute in Varna. Most graduate students he advised have already become noted scientific workers in the field of dynamics of ship engines and mechanisms. He has been a member of scientific and technical councils of our institutes and departments for he has given valuable assistance particularly in the development of shipbuilding and navigation. He is the bearer of Kiril i Metodiy Order 2d Class for long teaching activities. He has actively contributed scientific works and papers to congresses, conferences, symposiums and scientific sessions both at home and abroad. He is the author of over 70 publications in the field of machine dynamics. He is the head of the National Scientific Seminar on the Dynamics of Mechanical Systems whose center is in Varna.

His scientific work has earned him international prestige as a result of which, in 1971, he was elected secretary general of the International Federation on the Theory of Machines and Mechanisms -- IFTMM. In 1976

he became member of the Higher Certification Commission of the Council of Ministers. Last February he successfully defended his doctoral dissertation on "Identification of the Parameters of Mechanical Systems."

His idea on Calibrated Influence makes possible the elaboration of a general method for the identification of parameters of mechanical systems, of great importance in designing contemporary machines and mechanisms and controlling their operational characteristics. The dissertation offers a solution of a number of practical problems on the basis of this method such as determining the resistance of water in the course of the ship's movement, the effective power of the main ship engines, and others.

Captain First Rank Docent Doctor of Technical Sciences Engineer Emil Stoyanov Stanchev is the first Bulgarian military scientist to work outside the capital and have the scientific degree of doctor of technical sciences.



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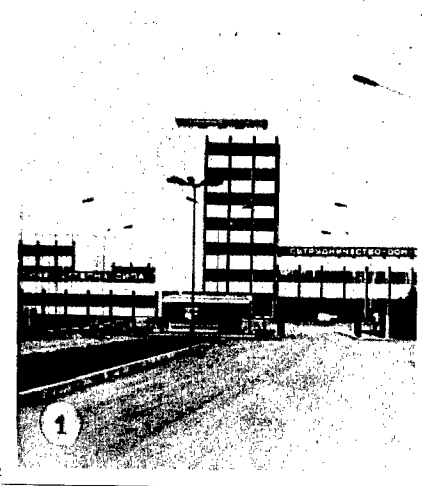
BULGARIA

EXPERIMENTAL BASE FOR NAVAL HYDRODYNAMICS DESCRIBED

Sofia VOENNA TEKHNKA in Bulgarian No 7, 1977 p 17

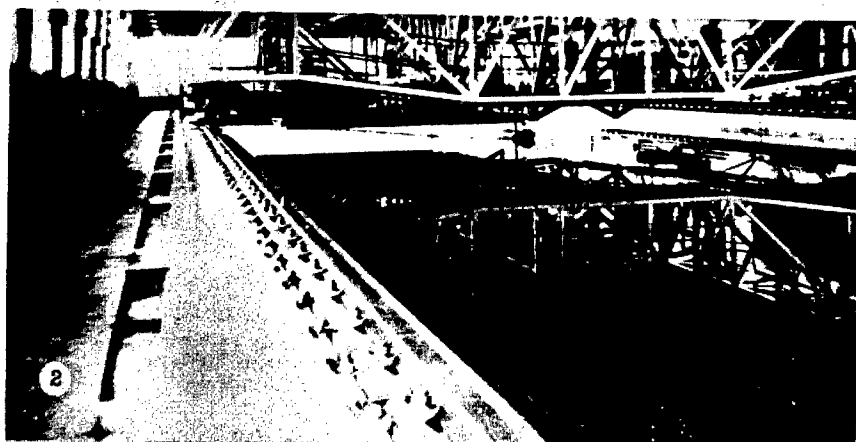
[Unattributed article: "Scientific-Experimental Base for Ship Hydrodynamics"]

[Text] Theoretical-experimental (laboratory and practical) hydrodynamic studies and tests are conducted at the base in Varna (photograph 1) needed for the designing and building of all types of ships, improving the operational qualities of vessels and creating and improving operational indicators of various engineering systems (hydrodynamics, transportation, oil extracting, pumps, turbines, and others).



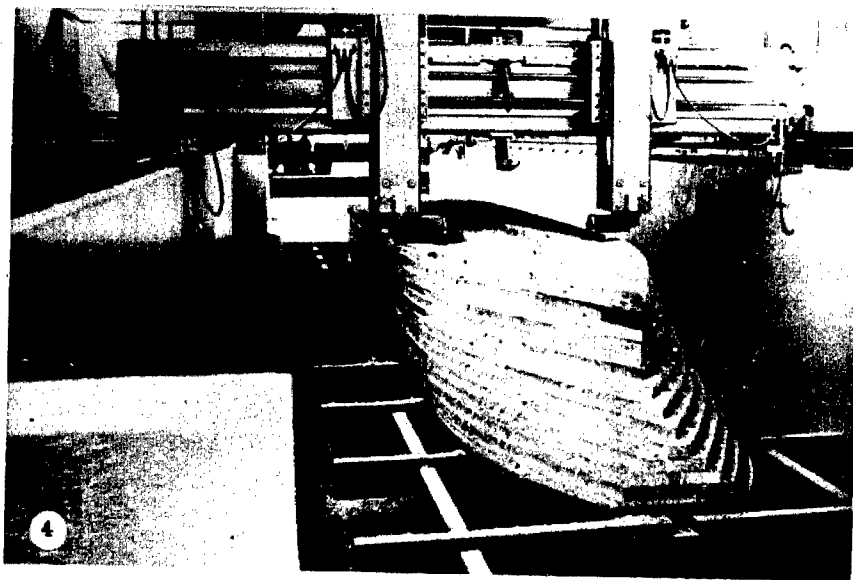
The base was established in cooperation with the United Nations Development Program and the Intergovernmental Maritime Consulting Organization (IMCO). At the end of 1976 a large percentage of the equipment, with the exception of the shallow and maneuvering-maritime basin, was completed.

The deepwater towing basin has three dock compartments. It is equipped with a basic towing cart which runs on tracks over the basin with a maximal forward speed of 6 meters per second (photograph 2). A fast towing cart with a maximal speed of 20 meters per second is planned. The maximal length of the tested models does not exceed 12 meters.



The shallow basin also has three dock compartments and a towing cart with a maximal forward speed of 6 meters per second and a wave maker for regular and irregular waves. Propellers with a diameter of up to 20 centimeters, the hydrodynamic characteristics of underwater wings, steering mechanisms, spray nozzle screws, and others are tested in the cavitation test tunnel (photograph 3). The workshops and laboratories of the base are equipped with most modern machinery (photograph 4) and apparatus.





Because of the results of such studies and experiments conducted at the base science is beginning an even more tangible production force which will unquestionably upgrade the effectiveness and quality of our ship-building.

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BULGARIA

WESTERN DEVICES FOR DETECTION OF TOXIC SUBSTANCES

Sofia VOENNA TEKHNKA in Bulgarian No 7, 1977 pp 25-27

[Article by Col Engr Todor Vachev: "Remote Control Detection of Toxic Substances"]

[Text] The development of fast-acting and highly toxic substances has triggered the need for the development of field apparatus for remote detection with high sensitivity, great selectivity, and maximal detection speed.

Many armies have developed and been supplied with automatic and semi-automatic instruments operating on the basis of chemical, biochemical, and physical-chemical principles.

Instruments using various chemical reactions, colorimetric in particular, have been developed. Such reactions are accompanied by the formation or breakdown of color indicators in a solution or on solid carriers. One such automatic recorder is the American instrument M6-A1. It is a ribbon instrument weighing 11 kilograms. It can operate uninterruptedly for 12 hours and its sensitivity is 0.001 mg/dm^3 with a 3-minute exposure.

The same method is used with the automatic analyzer E-41 which is more sensitive -- 0.00001 mg/dm^3 with a 3.5-minute exposure.

Some instruments are based on fluorescent reactions which result in the formation or breakdown of fluorescent substances. They are more sensitive than the colorimetric ones but are influenced by auxiliary factors which increases their margin of error.

The main shortcoming of the instruments using the chemical method is their relatively low sensitivity and great inertia. Despite this, however, the trend is toward their continuing development.

Automatic gas signals have been developed on the basis of the biochemical method operating on the principle of inhibiting the reactive acetylcholine -- cholinesterase system in the presence of organophosphoric toxic

substances. The extent of the inhibition may be determined colorimetrically with a suitable substratum. The biochemical method is highly sensitive and shows good selectivity. However, it is unable to detect the other toxic substances and is highly inert.

Recently the ionizing principle has begun to be applied in the development of automatic gas signalling devices. Such instruments are highly sensitive low inertia and general use. They suck in contaminated air through the ionizing chamber and register changes in the ionizing current in the presence of toxic substances. Such indicators have been developed in France and Sweden. However, they detect organic substances without determining which of them is toxic. Despite existing shortcomings, the ionizing principle is considered promising in the field detection of toxic substances.

All such gas signalling systems are described as local or "pointlike" since they detect a contamination with toxic substances in the immediate vicinity of the place where it was used. This is also their main shortcoming. The supervision of large areas would require many instruments or else the entire area would have to be covered by one instrument mounted on a car.

The designers have focused their attention on the creation of automated supersensitive detectors of toxic substances based on physical-chemical and physical methods for the instantaneous detection of toxic substances over large distances. The development of remote indicators is based on different principles. For the time being the most suitable are infrared spectrometry and laser detectors.

Infrared spectrometry is based on the property of matter to absorb infrared rays. The characteristic feature of this principle is the low inertness with relatively good selectivity and sensitivity. It makes possible the remote detection of toxic substances.

It is the basis for the development of the American remote detectors (Lopayr) and (Shopayr) which react instantaneously in the presence of organophosphoric substances. The infrared ray is reflected by a mirror and sent to a distance of about 400 meters, and the reflected ray is received and assessed by a special analyzer. Should an aerosol cloud of organophosphoric toxic substances cross the space between the source of the infrared ray and the reflection mirror, absorbing infrared rays, the analyzer records this radiation loss of the reflected ray and gives a signal. The sensitivity of the (Lopayr) system is 0.0001 mg/dm^3 for 3 minutes. Such remote indicators are currently used as stationary systems in the protection of important sites.

A major shortcoming of such instruments is that they are unable to detect toxic substances other than organophosphoric and that they may be used only in a static position. Work is being done to simplify these systems, replace the source of infrared rays and the reflecting member, and on the miniaturization of the system's elements.

Infrared spectrometry is a promising direction both for laboratory research and the detection of organophosphoric toxic substances under field conditions.

In many countries particularly extensive work is being done on the use of lasers for the remote detection of toxic substances in the atmosphere and the prompt notification of the troops. The partial reflection of the laser beam by toxic aerosols makes possible to determine also the average size of the particles contained in the cloud.

The laser beam has already been successfully used in some countries in the creation of instruments for the control of environmental pollution with industrial gases. Many specialists believe that it could be successfully used in the detection of toxic substances from a distance, thus informing the troops of the existence of toxic substances long before they could reach the contaminated sector or be caught up by the contaminated cloud.

It is on the basis of this principle that the British Army has developed the instrument (Lidar) for the remote detection of toxic substances. It is a laser detector connected with a radar which follows the enemy aircraft and, simultaneously, directs the laser beam released by the (Lidar) toward the aircraft. Should the aircraft disseminate in the atmosphere a cloud with toxic and bacterial aerosols, the laser beam is partially refracted and directed by the optical system to a photoelectric cell. The electric signal goes to an oscillograph where the recording of deviation on the oscillogram makes possible to determine whether or not the cloud consists of toxic substances and, if necessary, the sounding of a signal.

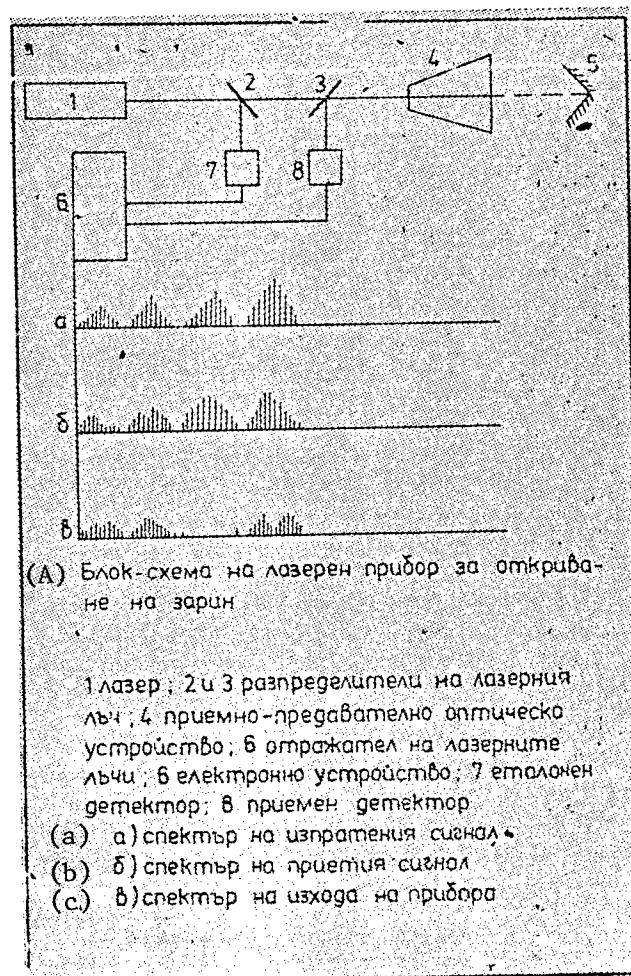
The United States has developed a laser system for the rapid and precise identification of atmospheric gases. The measurements are based on the principle that each gas absorbs some of the energy of the laser beam as it crosses it. The measurement of the absorbed energy makes possible a determination of the type and quantity of toxic substances in the atmosphere.

In 1975 it was reported that France has conducted field tests with an experimental model of a laser instrument used for determining the existence of sarin in the air. According to the specialists the instrument makes possible the remote (several kilometers) detection of sarin in the air. The area of the explosion may also be determined from the side as a result of the crossing of a laser beam at a distance in excess of 100 meters.

This instrument also operates on the basis of the property of organophosphoric gases to absorb laser beams within a certain spectral line. A comparison between the sent and reflected laser pulses makes possible the study of the atmospheric composition in the observed area. With a view to excluding any false triggering of the instrument caused by atmospheric disturbances the zone under observation is sounded with laser beams of variable frequency lasting several milliseconds.

The experimental laser instrument for the detection of sarin consists of a gas laser of variable frequency, an emitting and receiving optical part, an electronic system for the study and processing of laser rays, and a reflector of the laser beam mounted at a certain distance from the instrument.

The basic elements of the instrument and the principles for the study of the laser beam spectrum are shown on the figure,



Key:

- A. Block-diagram of a sarin detection laser instrument
- 1. laser
- 2, 3. laser beam distributors
- 4. reception-transmission optical system
- 5. laser beam reflector
- 6. electronic system
- 7. standard detector
- 8. reception detector
- a. spectrum of emitted signal; b. spectrum of received signal;
- c. spectrum at the instrument's outlet

It is clear that the most promising for the remote detection of toxic substances are the (Lidar) laser instruments. There are three main directions in the utilization of lasers: the Raman backscattering, the resonator backscattering, and the resonator absorption.

The possible use of the Raman backscattering and the resonator backscattering depend on the atmospheric visibility. These phenomena make it possible to detect toxic substances at small distances whereas the resonator absorption method extends this distance to 50 or more kilometers.

The computations made by some specialists indicate the basic possibility to develop a laser instrument for the detection of toxic substances at a distance of 10 kilometers from ground observation centers and several hundred kilometers from artificial earth satellites.

The practical implementation of this system requires the development of expensive and complex apparatus needed for thorough preliminary studies with a view to determining the possible sensitivity and selectivity of this principle.

Experiments are under way to develop a bionic detector of toxic substances which would detect even the most insignificant traces of toxic substances at a great distance. Its principle is the same as that of the ultrasensitive sensory organs of some animals, insects above all.

The trends in the development of instruments for the detection of toxic substances from a distance are directed mainly toward the designing of an automated chemical reconnaissance system based on the combined use of remote and local detectors, of the (Lidar) type above all, and gas signalling instruments with selective sensitive elements. The data of the detectors will be gathered at the center for remote transmission of computed values and assessed by a computer which would trigger sound and light signals in the presence of specific threshold concentrations of toxic substances.

5003

CSO: 2202

KIDNEY TRANSPLANT CAPABILITIES ASSESSED

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 12 Aug 77 p 7

[Article by Rainer Floehl: "Kidney Transplants in the GDR More and More Frequent"]

[Text] The health system of the GDR is judged quite variously here, but rejection or admiration is based less on the efficiency of the medical industry--which, there as everywhere, is difficult to judge--than on the social conditions. As international experience shows, however, the quality of medical care is much more dependent on financial outlay than on the structure of the health system. For this reason, medicine in the GDR generally attains a level corresponding to that in other industrial nations.

Gaps are naturally to be found everywhere. Thus the GDR (like the FRG, incidentally) is only gradually beginning to link up with international developments in the treatment of chronic kidney disease. While the FRG lies far behind in kidney transplants, through which sufferers of chronic kidney disease can best be rehabilitated (see FRANKFURTER ALLGEMEINE ZEITUNG, 26 Sep 77), the situation in the GDR is more favorable in this area, though far from optimal. The capacities for dialysis, blood purification with the artificial kidney, are less in the GDR. This is primarily because of bottlenecks in the supply of artificial kidneys, which must be imported, as well as the great expense required for such treatment.

In the FRG, because of the insufficient transplant activity, there is recourse to home dialysis. Sufferers from kidney failure treat themselves at home, which is cheaper and more comfortable (but still considerably more expensive than a transplant). The GDR has not yet taken up home dialysis. There, meanwhile, transplants are strongly encouraged. The necessary pre-conditions have been created in the last few years by the founding of a kidney transplant center at the urology clinic directed by Professor M. Mebel at the Friedrichshain Hospital in East Berlin. After an initial phase lasting several years, with relatively few transplants, this modern center achieved some 90 transplants for the first time in 1976; later the number is supposed to be 120 this year. Friedrichshain is already one of

the largest transplant centers in the world. (In general, only 20 to 50 kidneys are transplanted yearly.) At the same time, roughly 30 dialysis stations with 4 to 5 places each were set up throughout the country. There the patients are prepared for the transplants and treated until a suitable kidney is available for them.

In the GDR there are roughly 800 to 850 new cases of serious kidney failure annually. Over 400 sufferers could be rehabilitated by a kidney transplant. In order to expand the transport capacity of the GDR, additional kidney transplant centers were established in Rostock and Halle, with headquarters in Berlin. When these institutions are completely under way, 300 to 350 transplants could be made per year in the GDR. In 1975, 228 transplants were undertaken in the FRG, which is equivalent to 4 transplants per million inhabitants. In 1976 the GDR achieved 8 transplants per million inhabitants.

As for the survival period of the patients undergoing kidney transplants, that lies somewhat above the European average, as Professor Mebel said in an interview with the FRANKFURTER ALLGEMEINE ZEITUNG. This may be connected with the fact that these results are those of a single clinic with a high frequency of transplants. Such institutions generally achieve more favorable results than teams which seldom perform transplants. Results in the GDR may also be more favorable because the population is more homogeneous genetically. Differences in tissue types could be slighter and repellent reactions therefore less frequent. This would also explain why the transplant results in the United States, with its mixed population, are somewhat worse than in Europe.

M. Mebel assesses the further development of kidney transplants in the GDR as decidedly favorable. This optimism rests in part on the existence of clear legal guidelines for organ transplants. The Council of Ministers of the GDR issued a decree in 1975 which allows organs to be removed from dead persons if they have not specified to the contrary while alive.

Removal and transplantation of organs may take place, however, only in clinics selected by the Ministry of Health. Among other things, this licensing insures that surgical procedures in the removal of the kidneys are such that the organs can be immediately used by the transplant team (which must consist of other doctors). The conservation of the kidneys is thereby also made more uniform. In the GDR, the kidneys are simply rinsed with salt solution after removal and then stored in ice water. Thus the kidneys stay "fresh" for up to 24 hours. This suffices for the GDR, since it takes a few hours at the most for the organ recipients to reach the clinic.

Despite this transplant regulation, it is difficult to find clinics which remove organs. Obviously most doctors in the GDR also have strong psychological inhibitions and insufficient knowledge of the possibilities of kidney transplantation. The typing of the tissues of recipients and organ

donors has finally also been standardized. For this the Bezirk Institute for Blood Donation and Transfusion in Berlin is responsible, by supplying the hospitals in the outlying areas with standardized test serums.

As M. Mebel emphasizes, the success of kidney transplantation is also decisively dependent on monitoring after release from the hospital. Long provided centrally by the second medical clinic of the Charite [hospital in Berlin], this post-operative care is being increasingly decentralized, although the experiences collected in Berlin will still be relied upon. These have shown that medicines must be used early to combat the immunologically conditioned reaction crises, though, on the other hand, therapy may not be too long.

To decrease the uncertainties in this area, various research groups in Friedrichshain are endeavoring to recognize repellent reactions as soon as possible with immunological and biochemical procedures. They belong to the department of experimental organ transplantation, which works directly with the kidney center. Procedures for determining the vitality of the kidneys before transplantation are also being sought, as well as new conservation procedures which make possible a certain metabolism of the cells even at low temperatures, and thereby save them from damage.

Despite its prominent position in the health system of the GDR, the kidney transplant center in Friedrichshain is by no means a pretentious institute. It belongs to a large municipal hospital in the center of Berlin. The equipment is on a par with that of Western European countries, though it may be well over the general standard of the GDR. Thus far, it has a few serious competitors in the FRG, such as the Surgical University Clinic in Munich, which strives for 150 transplants annually with the support of the Curatorium for Home Dialysis and the Free State of Bavaria, as well as the centers in Hanover, Heidelberg, and Essen.

8992

CSO: 2302

HUNGARY

ELECTRICAL INSTALLATION OF NUCLEAR POWER PLANT DESCRIBED

Budapest VILLAMOSSAG in Hungarian No 8, 1977 pp 251-254

[Article by Jozsef Ponya, graduate electrical engineer, deputy director of Paks Nuclear Power Plant Enterprise, and Istvan Knizner, graduate electrical engineer, head of the electrical department of Paks Nuclear Power Plant Enterprise, member of the Association of Hungarian Electrical Engineers: "High-Voltage Electrical Installations of the Nuclear Power Plant in Paks"]

[Text] UDC:621.311.25(439.125-201)PAKS 621.312-85

I. The Construction of the Nuclear Power Plant

Nuclear energy already accounts for a significant percentage of the supply of electrical energy. The world's total electric power plant production capacity is approximately 1,800 GW; of this, nuclear power plant production accounts for approximately 160 GW, representing about 10 percent of the total production.

The role of nuclear energy is expected to increase in the near future and its contribution to the production of electrical energy will increase at a fast rate. It is expected that the total world production of electrical energy in 1980 will be 2,100 GW, generating a total of 9,200 TWhr. Approximately 19 percent of the energy produced will come from nuclear power plants. The corresponding figures for 1990 are expected to be 4,000 GW total production and 17,000 TWhr, respectively, and about 58 percent will be coming from the expected total nuclear capacity of about 1,900 GW. By the turn of the millenium, we will need a total capacity of approximately 7,200 GW and a production of 31,000 TWhr, of which production from nuclear power plants is expected to account for about 83 percent, with a capacity of about 5,300 GW.

In Hungary, we expect that the need for electrical energy will amount to 35 TWhr in 1980, 70 TWhr in 1990, and 130 to 140 in 2000. To meet the demands, we plan for a domestic energy production capacity of 5,900 MW in 1980, 13,000 MW in 1990, and 25,500 to 27,500 MW in 2000 from power plants.

On the basis of an analysis of our energy-source situation we find that in order to meet our needs we must start nuclear power plant blocks: this is scheduled for 1980. In 1990 we must obtain approximately 28 percent of our electric supply from nuclear power plants, and in 2000 approximately 48 percent.

The first stage of our nuclear power plant construction program is Paks, where a capacity of approximately 5,000 MW may be installed. Of this capacity, government approved the construction of a power plant capacity of 1,760 MW.

The Paks Nuclear Power Plant is built within the framework of a Hungarian-Soviet intergovernmental agreement, utilizing Soviet assistance and Soviet experience. The domestic industry supplies conventional power plant equipment and — on the basis of production cooperation agreements — some auxiliary nuclear equipment.

The nuclear power plant consists of four VVER-type energetic reactor blocks, each with a thermal output of 1,375 MW. The rated electric power of the power plant is 1,760 MW, which will be realized in two stages, accounting for 880 MW each. The individual blocks are scheduled to start in 1980, 1981, 1983, and 1984, respectively.

II. The Electrical System of the Power Plant

The Electrical Network Connections of the Power Plant

The power plant will be connected to the national network through a 400/120 kV outdoor station (see the simplified sketch of the electrical system). Four hundred kV is used for the supply to Martonvasar, Kaposvar, and Szeged, and later probably also Pecs. The transmission line of 120 kV will be used for the supply to Tamasi, Szekszard, Kalocsa (two) and Dunaujvaros (two). Additional transmission lines will be established later.

The 400 kV switching system is of the 1-1/2 interruption mixed type, meaning that the field sequences are phase-capsulated units, while the collecting rails and line devices are conventional units. The SF6 gas capsulation method is used for the special interruptor, field-blocking, and field-grounding devices.

The 120 kV switching system is conventional in design, and features dual collecting rails and one interruptor per branchoff, as well as an auxiliary rail.

The blocks of the power plant are connected to the station over 400 kV. The 400 kV and 120 kV rails are connected to each other through 4 250 MVA transformers with economizer circuitry, tertiary winding, and ability to be regulated under load.

Generation of Electric Energy

Each reactor generates thermal energy through the appropriate auxiliary devices for two turbine generator units, each of which has a power of 220 MW.

The turbine generators are connected to the 270 MVA transformers through phase-capsulated rails. The special feature of the block connections of this type, distinguishing them from the conventional domestic large blocks, is that there are generator-voltage interrupters of Soviet manufacture between the generators and the machine transformers. There are two such generator-machine transformer blocks for each reactor block; they are connected to the SF6 capsulated devices rectified at a voltage of 400 kV (Fig. 1).

Energy Supply of the Auxiliary Operation

The requirements imposed on the auxiliary operation insofar as the electrical devices and systems are concerned represent the main difference between nuclear and conventional energy generation. Safe operation of the nuclear technology, precise servicing of the routine and emergency shut-downs, and the localization of any malfunctions that may arise all impose special needs regarding the safety of electric energy generation.

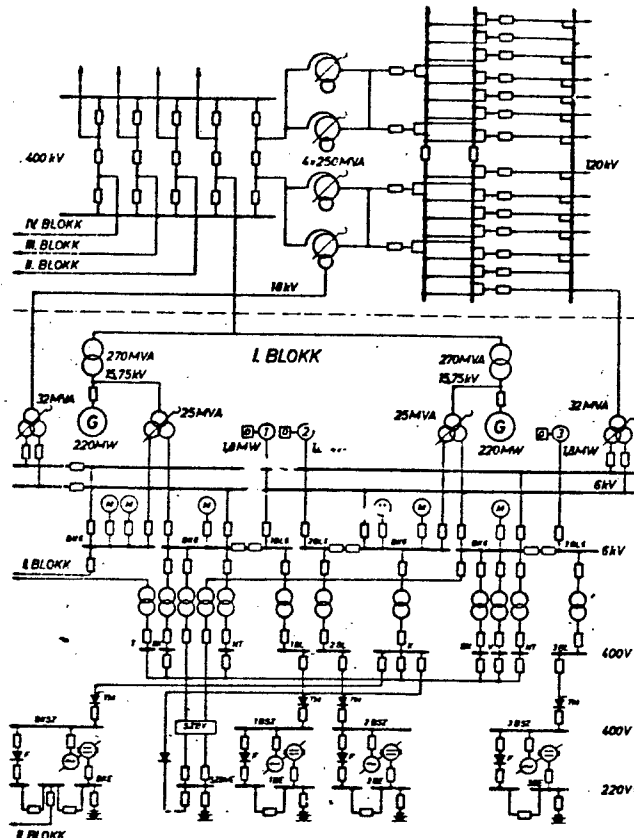


Figure 1

Key: 1. Block

The energy-supply system for auxiliary operation reflects the needs of the users. The facilities of internal operation may be classified according to the need for uninterrupted energy supply and reliability.

There are the following user groups in terms of the permissible period of energy-supply interruption:

1. CONTINUOUS users: those devices which require uninterrupted supply and those for which the supply voltage may not be interrupted for more than three seconds.
2. VITALLY IMPORTANT users: those devices for which the supply voltage may be interrupted for up to 40 seconds but require short or continuous supply after an interruption.
3. STANDARD users: those devices which impose no particular requirements on energy-supply continuity.

There are the following devices which contribute to the dependability of the energy supply:

1. USERS FORMING PART OF THE SAFETY SYSTEMS: those devices which are essential for cooling in scheduled and emergency reactor shutdowns and for the localization of the malfunctions which may occur as a result of defects in the technological equipment, and which therefore require continuous energy supply.
2. USERS NOT FORMING PART OF THE SAFETY SYSTEMS: those devices which play no part in the cooling of the reactors and the localization of malfunctions.

The manner in which the requirements imposed on energy supplies are complied with are seen in Fig. 1, which also shows the auxiliary-system network for one reactor block.

Auxiliary Operation Outside the Safety Systems

All internal users are regularly supplied from 25 MVA auxiliary-operation transformers which in turn are supplied from the rail connecting the generator and the machine transformer. By using generator-voltage interrupters, this connection provides dependable supply not only in normal operation but also during startup, shutdown, and even generator malfunctioning. The transformers are of the divided-winding type on the low-voltage side. This feature permits the use of four 6 kV block collector rails per reactor block (BK6 rails).

The supply of the internal users may also be provided from the line side with two reserve transformers of 32 MVA output each. The first of these is connected directly to the 120 kV switching units, and the second is connected to the tertiary winding of one of the reserve transformers. A single reserve transformer suffices not only for the replacement of the defective auxiliary-operation transformer but also for the shutdown of an entire reactor block in case of a malfunction.

The reserve transformers are also of the divided-winding type on the low-voltage side; thus, they contain two reserve collector rails under voltage in a simple design. The 6 kV block dividers may be supplied if the operational supply fails from the reserve collector rails through individual reserve supply systems.

The direct users of the 6 kV block dividers are safety systems with higher than 200 kW consumption, as well as standard-supply motors (such as supply pump motors, cooling-water pumps, condensation-water pumps motors), as well as the 6/0.4 kV transformers. The figure shows only the transformers of the main operational building; it does not show the external ones (for boiler room, water-softening plant, outdoor substation, and so forth).

The main operational building has the following users supplied from the 6/0.4 kV transformers to obtain 400 V power: the illumination distributor (V), the distributors of the primary-cycle pressurized vessels (NT), common distributor (K), and reserve distributor (T).

The electric heaters regulating the water pressure receive power from the distributors of the pressurized vessels. The standard-supply devices supply power to the block distributors to the individual blocks (such as the generator auxiliary operation pumps and turbine slider valves), and the common distributors supply power to the standard users such as the main-building shops, laboratories, and machine-shop cranes.

The distributing transformer of the reserve and the 6 kV block distributor of the other system of identical design are connected. In case of an emergency, all 400 V distributors may be supplied from the reserve distributor.

This considerably improves the energy-supply dependability of the users of the latter.

The supply of the users requiring continuous energy but not forming part of the safety systems is provided from the block direct-current distributor (BKE) and the block continuous distributor (BKSZ).

This supply system consists of a battery unit, a d.c. distributor, reversible motor-generator units, and a.c. distributors. In view of the fact that the d.c. system is insulated, the distributor also contains a ground-seek rectifier system (F). The d.c. distributor has also a reserve supply feature through the BKE distributor of the other block, forming part of the same unit.

Among the devices obtaining 220 V, d.c., supply are the reserve oil pumps of the generator shaft locks, the block protector units, the control systems, and the automation units.

Among the devices obtaining 400 V, a.c., uninterrupted power from the appropriate distributor are the memory and logic units of the information computer, some radiation-control devices, the communication centers, and some slider valves of the turbine hall. The distributor is supplied from the 400 V common distributor (K) without a contact, through a thyristor interrupter. This ensures the automatic detachment of the continuous distributor from the standard supply system if the voltage drops to below a set value. It also ensures the automatic and synchronized reconnection to the system once the proper voltage is reestablished.

In its operating mode, the motor generator feeds the d.c. users from the a.c. rail, and also charges the battery unit. If the operational supply is detached, the a.c. users are supplied from the battery unit through the reversible motor-generator unit.

The power transmission supply of the control and safety system of the reactor (SZBV) is from two 6/0.4 kV transformers, each acting as the reserve for the other. No supply provisions exist from the reserve distributor (T). During short-term voltage drops, the power supply of the power transmission device is achieved from a battery unit provided just for this purpose and the d.c. distributor (SZBVE) to ensure that the nuclear power plant remains in the energy system during transient operating modes (for example the startup of large users, shorts before protective devices start). Charging of the battery unit is from a common 400 V distributor.

Auxiliary Operation Forming Part of the Safety System

There are three independently operating technological safety and localizing systems for accomplishing the cooling required with reactor shutdown and the localization of malfunctions. The emergency supply of these systems is from three independent safety electrical systems. Operation of a single system suffices for the cooling of the reactor and the localization of the malfunctions. This represents a high degree of safety since it is highly unlikely that three independent systems would become faulty at the same time.

The following are the main components of the electrical safety system: the Diesel generator units (1D, 2D, 3D), the vital 6 kV distributors (1BL6, 2BL6, 3BL6), the 6/0.4 kV safety transformers, the vital 400 V distributors (1BL, 2BL, 3BL), the thyristor interrupters (TM), the 400 V uninterrupted a.c. distributors, the d.c. distributors (1BE, 2BE, 3BE), the battery units, and the ground-short seekers (F).

The operational supply of a safety system is always from a single 6 kV block distributor. Under operating conditions, the supply of the uninterrupted distributor is from the vital distributor, while the d.c. users obtain power from the machine group. If there is voltage interruption on the supplying 6 kV block distributor, and no voltage appears after the operational period of the 6 kV reserve supply either, then the two series rail-severing units disconnect and the Diesel generator unit receives a start command. (We employ two series switches to ensure dependable switching.)

The vital distributors are without voltage while the machine group runs up to speed. In those instances the uninterrupted distributor is automatically detached and supply comes from the d.c. distributor. Under synchronous rotation, the Diesel generator machine group switches to the vital 6 kV distributor, the generator reaches the rated voltage, and the automatic sequential connection of user groups starts, depending on the program for the malfunction involved. As the vital voltage appears, the uninterrupted users revert to operational supply. The Diesel generator machine group is capable of assuming the full rated power 35 seconds after the start command.

Each Diesel generator unit has its own 220 V battery unit, from which control functions, automation functions, and lighting are powered if there is an interruption in the auxiliary-operation voltage.

The individual power requirements of the uninterrupted users in the safety systems are such that 400 V a.c., or 220 V. d.c., power suffices for their operation. For example, the operating and safety circuits of the SZBV systems require d.c. supply; part of the emergency lighting requires the same. Among the units requiring 400 V a.c. supply are the following: the measuring and control instruments, the control-engineering and automation units, and the switchover units for malfunction and localization.

(Note: Among the nuclear power plants in the CEMA area, the nuclear power plant in Paks is the only one not requiring the supply of 6 kV uninterrupted users. The 6 kV pumps circulating the cooling water of the reactor during shutdown must operate even if there is a problem with the electricity supply to bridge the period during which the reactor changes to natural circulation. Conventionally these main circulating pumps are supplied by the auxiliary-operation generator connected to the shaft of the main generator; this unit provides power in the event of malfunctioning in another unit while the turbine-generator unit runs out. This complex procedure considerably reduces the operational readiness of the turbine-generator assembly. The main circulating pumps of the nuclear power plant in Paks are stuffing-box centrifugal pumps with high inertia so that they ensure the changeover of the reactor to natural circulation, no matter what electrical malfunction took place. Thus, they are supplied from 6 kV block distributors as shown in the figure, which illustrates only the main circulating pumps from among the users.)

The vital users with a power of more than 200 kW, forming part of the safety system, are supplied from the vital 6 kV distributors. The following are among these users: the primary-cycle reserve water pumps, the technological cooling-water pumps, and the pressure-reducing sprinklers in the sealed area.

Among the devices supplied from the vital 400 V distributors are the emergency supply pumps, the cooling-water pumps of the main-circulation pumps, the compressors of the pneumatic drives, the fans of the ventilating systems, and the pumps of the water-purifying system.

Placement of the Safety Devices

The main-building distributors of the safety systems are placed in such a manner that the devices of the various systems are not even in adjacent rooms with a common wall. They are also segregated from the switching devices not forming part of the safety system. The battery units of the safety systems and their reversible motor generators are in rooms of their own. The cable routes of the various safety systems are fully insulated from each other with fire-stop walls good for at least 1.5 hours.

A Diesel station encompassing six machine units each is assigned for each building stage. Every individual Diesel generator unit — together with its associated equipment — is segregated from every other such unit by a fire-stop wall good for at least 1.5 hours.

As a result of this placement system, devices which in an emergency replace each other remain operational if there is a fire or another emergency.

III. Some Major Features of Domestically Made Devices

Most of the primary devices of the 400/120 kV station are made by GVM [Ganz Electrical Works]; the SF₆ capsulated unit and its associated equipment are made on the basis of a BBC [Brown Boveri] licence.

The turbo generators are Type TVV 221, 220 MW water-hydrogen cooled devices with Soviet type connection fittings; they are all made by GVM. They are excited with a group of machines rotated from the generator shaft through a transmission unit. The voltage is automatically regulated by a thyristorized high-speed regulator built up from integrated circuit components.

All 6 kV distributors are made by VERTESZ; they are Type 10 BOTO, indoor, divided plate-capsulated units. Type A 10/750/25 and A 10/500/8 small-oil volume interruptors are used in the distributors.

Among the 6/0.4 kV transformers, the SZVB transformers are of 250 kVA power; all others are 1,000 kVA power. All are of the NALO type with cast resin insulation. They are made by Csepel Transformer Factory.

The 400 V and d.c. distributors are manufactured by VERTESZ; they are Type 06R, sectional, plate-capsulated devices, equipped with ELEKTRON and A3700 type modern protected, Soviet-made high-speed air interrupters.

The reversible motor generators, with 150 kW power each, are produced in the Soviet Union. The domestic industry would have had to charge exorbitant prices for developing and producing electronic inverters suitable for this task.

From among the acidic lead battery stations belonging to one reactor block, the battery station for the d.c. distributor of the block (one unit) has a capacity of 1,152 Ampere-hours. The d.c. distributor of the SZVB (one unit), that assigned to the safety systems (three units), and that assigned to the Diesel generators (three units) has a capacity of 576 Ampere-hours.

It can be seen from the foregoing that the designing, building, installing, and operating the electrical equipment of the nuclear power plant in Paks represented a qualitatively new task for the experts compared to conventional power plants.

2542
CSO:2502

HUNGARY

SUPERVISORY CHANGES, APPOINTMENTS AT ACADEMY OF SCIENCES

Budapest AKADEMIAI KOZLONY in Hungarian 15 Sep 77 p 1

[Text] The first secretary of the Academy has decreed the following changes in personal jurisdiction in the interest of creating a uniform Academy official structure: The Central Office, the Main Department of Social Sciences and the Main Department of Personnel will be under the jurisdiction of Bela Kopeczi, deputy secretary general; the Main Departments of Natural Sciences I and II and the Main Department of International Relations will be under the supervision of Istvan Lang, deputy secretary general.

The first secretary of the Academy has appointed Sandor Konya, candidate, as director of the Central Office. The director will exercise direct supervision over the Administrative and Legal Main Department, official supervision over the Scientific Corporate Secretariat and deputed authority over the Main Department of Finance.

Other new appointments and personnel changes: Laszlo Sary as head of the Administrative and Legal Main Department; Janos Domeny as head of the Main Department of International Relations with Mrs Sandor Keleti, counsellor, and Pal Bodon as deputies; Istvan Csomo as head of the Main Department of Finance with Attila Tompa as his deputy; and Ferenc Rottler as head of the Main Department of Social Sciences.

CSO: 2502

HUNGARY

BRIEFS

SACCHARINE SUBSTITUTE--Using an original, patented process, the Chinoi Pharmaceutical Factory intends to produce a product having outstanding sweetening properties from vegetable matter. The vegetable matter, the flavones, are derived from the yellow and red pigments of certain fruits and vegetables. Experiments are progressing well. The factory is certain to be able to put the new sweetener on the market within 2 - 3 years. The patent which currently bears the code number CH 401 has been announced abroad. Several transatlantic firms and research institutes are taking part in the testing. This includes a prestigious U.S. pharmaceutical firm. [Budapest MAGYAR HIRLAP in Hungarian 2 Aug 77 p 5]

CSO: 2502

POLAND

BRIEFS

MORE PACEMAKERS--Heart diseases are becoming more widespread and gain for themselves the designation as the disease of the 20th century. In recent years we note a significant increase in technical achievements in the field of medicine having tremendous significance for heart treatments. One of them is mastering the production of miniature heart stimulators which have made an encroachment into our medicine for good. At present, approximately 2,000 of these apparatuses are being implanted annually in Poland in patients whose state of health demands it, and the number of people living with them already amounts to 4,000. A great significance for the efficient operation of the implanted stimulators is the very well organized and efficiently operating system of periodic medical control of the patients who have implanted stimulators. Due to the control of the faults coming to light in the functioning of the stimulators over the years, no case of a sudden breakdown of a pacemaker, with tragic consequences for the patient, has been registered in Poland. At present, implantations are performed in 15 clinics in Poland. [Text] [Warsaw TRYBUNA LUDU in Polish 20 Sep 77 p 6]

CSO: 2602

ROMANIA

SCIENTIFIC NATURE OF ACUPUNCTURE STRESSED

Bucharest FLACARA in Romanian 25 Aug 77 p 11

[Interview with Dr Toader Caba by Ovidiu Ioanitoaia]

[Text] [Question] Dr Caba, you are one of our most formidable practitioner of acupuncture. At the Calan Hospital you have treated thousands upon thousands of patients by acupuncture, covering a broad range of ailments from simple algesia, rheumatism, or neuralgia, to the more complex forms of asthma, bronchitis, paresis, or paralysis, always with encouraging results. Our paper has already written about you, indicating that you have published two books on the subject: "Introduction to the Practice of Acupuncture" in 1973, and "Treatment of Illness by Means of Acupuncture" in 1976. What has happened since then?

[Answer] I have recently published a third book, "Acupuncture, Tradition and Modernity," in which I attempt to support my strong concept of the human organism, and in which I establish a connection between that which traditional Chinese medicine knew about man some two thousand years ago, and that which modern medicine is striving and succeeds to discover in the same domain.

[Question] And what did traditional Chinese medicine know about man?

[Answer] Very much, especially because unlike today's medical practice which is increasingly divided into specialties, it viewed man in his pathologic and physiologic complexity, placing its foundations on a very accurate examination of the human body and of the influences of the environment on the body.

[Question] You mentioned your own concept of these matters. Could we return to that point?

[Answer] The world renowned Romanian scholar Henri Coanda sustained, and many others have adopted his ideas and disseminated them, that man is an aquatic phenomenon, a statement prompted by the large amount of water which

in one form or another composes the human organism. I dare believe that man is not only that, but that he also represents a solar phenomenon, each of us in essence constituting a minute sunbeam. Starting with this supposition, I regard the human organism not only as a morphologic and functional unit, but as an energetic one as well, a point at which the classical Chinese and modern medicines are becoming similar, both of them recognizing three forms of energy, for which they obviously use different terms, but which are related to the point of superposition. Seen in this light, the human organism appears as a complex entity behaving according to well established laws, whose control and regulation involves some common factors, among which is the action of acupuncture needles.

[Question] Was there a period during which modern medicine ignored the wealth of information and practice of acupuncture? Since I can guess the answer, I will ask you why this attitude was possible?

[Answer] To my knowledge, it was due to the exaggerated vanity of modern medicine, which at one time believed that it could explain all the phenomena associated with the miracle called man. Today, even if it does not have logical explanations for all phenomena, medicine can no longer afford to discredit them as it used to, but seeks to place them in the service of man. In fact, molecular medicine has demonstrated by means of proofs which are difficult to refute, that acupuncture is profoundly scientific and far from being a simple empirical observation. The so-called Kirlian photography has shown the existence of acupuncture points along meridians, offering for this ancient practice a scientific support, the existence of which many doubted at one time. To the honor of Romanian acupuncture, one of its representatives, Dr Ioan Florin Dumitrescu, has pursued Kirlian's research to greater depth, and although oriented more toward the laboratory than toward practice, has extended its meaning by inventing electrochronography; using this technique, he has succeeded in drawing an electrical map of the human organism, demonstrating that certain malfunctions of the organism are accompanied by changes in its electric charge.

[Question] I was present when a few weeks ago, you received the Diploma of Honor of the World Congress for Acupuncture, at which time you were also elected member of the Hong-Kong Acupuncture Society.

[Answer] At one time I was censured for practicing acupuncture. Now, when I was being congratulated, I was sincerely happy, not for the distinctions which were awarded to me, but because I detected a radical change in the attitude of the Ministry of Health toward acupuncture, a support which we, acupuncture doctors are experiencing today in our activities. It was especially for the latter that I was glad.

[Question] Doctor, since you are, whether you want to or not, one of the pioneers of this skill in Romanian medicine, what do you think should be done so that our acupuncture will continue to be of greater use, as you so well stated, to public health?

[Answer] Very receptive to our suggestions, the ministry is studying the possibility of establishing a National Center for Acupuncture, whose opening I dare believe remains a matter of days or weeks. If they continue to work, and I can confirm that they do, with such encouraging results, acupuncture doctors should join in a society as is done throughout the world. It would not harm to publish a specialized journal, just as I believe that some knowledge of acupuncture should be introduced in university programs, given the fact that many countries on other continents than just Asia (Japan, China, Vietnam) have specialized acupuncture departments operating within their medical institutes.

[Question] Is there anything else, doctor?

[Answer] At the request of professor Haruto Kinoshita, chairman of the Fifth World Congress for Acupuncture which will be held in Tokyo on 22-25 October, I have sent to Japan the paper "Mechanism of Moxei Needles and Massage in Acupuncture Through the Intermediary of Prostaglandins (PG) and Cyclic Adenosine-Monophosphate (AMPc)," which represents a personal contribution. I hope that it will be well received, not for my own glorification, but for the popularization of Romanian acupuncture.

[Question] If we may say so, so do we.

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