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USSR Report

ENERGY

(FOUO 8/82)

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ELECTRIC POWER

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METHODS OF CALCULATING NUCLEAR-FUEL EXPENDITURES DISCUSSED

Moscow ELEKTRICHESKIYE STANTSII in Russian No 3, Mar 82 pp 6-9

[Article by L. D. Gitel'man, candidate of economic sciences at the Ural'skiy Polytechnical Institute: "Particular Features of Calculating and Planning Expenditures for Nuclear Fuel "]

[Text] Up until now, the matter of calculating and planning nuclear-fuel expenditures has been a controversial question in the economy of nuclear power stations. To a considerable degree, this is associated with the specific properties of nuclear fuel and the characteristics of its production consumption at AES's. The calculation of the fuel component in the cost of electric power from AES's is complex and differs fundamentally from the method employed at thermal electric-power stations. The calculation is complex, since it requires that one consider many constantly changing fuel-cycle parameters, the depth to which the nuclear fuel burns, partial-recharge operation of the fuel assemblies, the presence of a transient period of reactor operation and the feasibility of reclaiming spent fuel.

The method used to calculate the fuel component must have the correct theoretical basis. Up until now, the points of view regarding the economic nature of the reactor's fuel load have been varied. In [1] it is shown that, theoretically, the necessity of applying the fuel load to the fixed capital has been clearly established for AES's operating in an open fuel cycle. Recently, many practical and scientific workers who previously held another opinion (the fuel load is to be applied to the working capital) have since changed it. Thus, the authors [2] believe that the fuel load must first of all be applied to the AES's fixed capital, while the fuel assemblies added during partial recharging must be applied to working capital. Such a "split" solution is theoretically incorrect, since, with the exception of monies invested in the initial fuel load, capital is not required to carry out partial rechargings. With a correctly formulated method for calculating the fuel component, each group of fuel assemblies transfers its cost to the cost of electric power up until the moment that assembly is replaced. We shall explain.

In the general case, the fuel component consists of n similar groups of fuel assemblies (each similar group is taken to be a specific set of fuel assemblies possessing identical cost and service life). The cost of each similar group is transferred to

In the form of a discussion. Ed.

the electric power in accordance with the group's service life. The first group of fuel assemblies transfers its cost per unit of time in the amount of C_1/T_1; the second is C_2/T_2; the third C_3/T_3, and so forth. Thus, the initial advanced cost of the fuel charge

$$C_{FC} = \sum_{i}^{n} C_i$$

is broken into parts from the moment the fuel charge enters the production process. Each of these parts begins to be converted at a very specific rate.

Up until the moment any of the fuel-assembly groups is replaced, cash must be set aside to accomplish recharging. This is possible if the amount of the cost transferred over a specific period of time corresponds to the amount of the fuel charge burned. The latter is determined as the total burn-up of all fuel-charge components of similar groups. Consequently, if this condition is met, partial rechargings do not require additional expenditures. A portion of the initial advanced cost which has returned to its initial point is spent for this purpose. If additional fuel assemblies or assemblies more expensive than those previously located in the core (it is possible, for example, in the transition period when fuel-assemblies of a higher enrichment level are loaded) are used during recharging, then additional funds are required. In this case, these funds must come from capital investment.

The issue of the economic nature of the fuel charge is not only theoretical--it has important practical significance. The application in practice of the fuel charge to the working capital leads to a number of negative points, aside from the difficulty in creating a method of determining the fuel component. In design practice, the determination of the indicator for per-unit capital investment in construction is based on the cost of the fixed capital created. When the fuel load is applied to the working capital, the value of this indicator is reduced considerably. In accordance with the existing stand on financing the working capital of an enterprise under construction, the necessary cash funds for manufacturing the first fuel charge are allocated after a considerable delay. This complicates the mutual financial relationship of the client and the manufacturing plant.

The method employed for calculating the fuel component must meet the following requirements:

it must provide for the feasibility of regenerating the fuel charge when the reactor reaches its maximum service life;

it must include in the electric-power cost the total expenditures for partial recharging;

it must be as stable as possible over the course of the period for which the release tariff on electric power is established (over the course of the five-year plan, obviously);

it must be simple and easy to use;

it must be as universal as possible; that is, it must be suitable for making calculations at AES's with various types of reactors and different methods of fuel-cycle organization (operating on "waste" or with regeneration, with "complete burning" of fuel assemblies unloaded in the transition period or without their repeat utilization).

In order to realize complete regeneration of the fuel charge, one must, in our opinion, establish a depreciation rate for the renovation. This rate must be determined based upon the reactor's service life. As far as partial recharging is concerned, there are a number of specific features stemming from the presence of a transition period of reactor operation (as noted in [3], page 298, "in the general case, any change in the technical-economic characteristics of the fuel elements used gives rise to a transition period."). This transition period can reach 6 to 8 years for a channel-type reactor. Fluctuations occur in the fuel assemblies during this period, and they can be eliminated by only one method--by a proportional distribution of the future recharging expenditures for any period.

Obviously, it is necessary to establish a five-year accounting period. The objections of some operational workers based on the difficulties encountered in predicting recharging expenditures for 5 years in the future are not to be examined as a contrary argument, since the five-year plan for an AES, just like for any other enterprise, is developed according to a mandatory procedure. The problem consists of achieving the necessary degree of accuracy in the average term calculations.

Thus, expenditures for partial rechargings must be written off gradually according to a fixed rate, despite the economic notion that the rate of depreciation for major overhauls not approved in the state planning agencies is a local accounting entry.

As a result of the theoretical approach examined, we have developed a working method that combines long-term fuel-assembly planning (for the five-year plan) and current fuel-assembly planning (annual) and determines the actual fuel-assembly value.

In [2] it is suggested that the time factor be taken into consideration when determining the annual deductions from the initial fuel charge. We will note the method used at AES's in capitalist countries: the annual totals for depreciation are discounted by the amount of income which these funds bring to the enterprise. These funds remain in circulation until the moment when they are needed for total regeneration of the fuel charge. In our country, a number of economists propose that the time factor be taken into consideration when calculating the depreciation deductions. Without going into a theoretical discussion, we note that, in our opinion, the examination of this factor as applied to AES's is premature until the matter is resolved for the economy as a whole.

The problem is more complex when it comes to the regeneration of spent nuclear fuel [4]. In this case, production at AES's must be considered as multipurpose: the generation of electric power and the manufacture of intermediate products in an effort to extract plutonium-239 and the remaining uranium-235. Dual-purpose production is examined for further simultaneous production of hot water and steam at an AES (an ATFTs). The distilling of water and the carrying out of radiochemical processes, etc., are possible in principle.

The cost of fuel in dual-purpose production is split--one half is included in the cost of the electric power, the other in the cost of the intermediate products. Since the duration of the electric-power production cycle and the intermediate-product cycle are not identical, the process by which each indicated part of the fuel-charge cost is transferred to the output takes place in various ways.

The electric-power production cycle at AES's is many times shorter than the period of fuel-charge functioning. Consequently, a corresponding portion of the fuel-charge cost is gradually transferred to the electric power and is likewise gradually replaced in cash form to the degree it is realized. Only fixed capital is similar in nature with respect to productive consumption and cost turnover.

The production cycle for intermediate products is equal to the time individual groups of fuel elements are located in the reactor, that is, the operating period. Consequently, the other part of the fuel-charge cost is transformed to the manufactured product in one production cycle and is replaced in cash form after its realization. Obviously, this part of the cost appears as working capital.

This is illustrated in the drawing for an individual fuel element in the fuel charge.

In bookkeeping practice, an individual accounting of the fuel-charge cost components is not suitable. The following conclusions can be made in favor of including it with the fixed capital.

In the first place, in a fuel cycle without regeneration, the issue of the economic nature of the fuel charge as fixed capital is resolved clearly, as was shown. In the general case, when the AES operates in a cycle with regeneration as well as without it, uniformity will be insured in accounting for the fuel charge.

In the second place, including the fuel charge in the fixed capital makes it possible to consider the objective nature of the movement of the greater part of its cost (the formation and utilization of the depreciation fund and the procedure for financing regeneration). For fast reactors where the core and breeding blanket are separated in the design, another solution is possible: the cost of the core is applied to the AES's fixed assets, while the cost of the breeding blanket is applied to the working capital.

The features noted for fuel-charge productive consumption in an AES reactor operating in a closed fuel cycle must be taken into account when calculating the cost of the power generated. The selection of a method of calculation depends on how the AES output will be classified according to the specific purpose of the production process.

Obviously, the primary purpose of production at an AES with thermal reactors will be the generation of electric power. Thus, in this case, this product will also be the primary one. The spent fuel (intermediate product) in which plutonium is accumulated, formed as an unavoidable result of the production process, must be examined as a by-product. Since the latter is an unavoidable consequence of the production process, one can assume that only a portion of the past labor applied to the cost of the raw material from which this by-product is derived and only a part of the direct expenditures in its manufacture (if there are such) take part in the formation of its cost. All remaining expenditures in the given production process are applied to the cost of the primary product.

The production process at AES's with fast reactors is arranged so as to obtain two specific products--electric power and plutonium. Consequently, each of these is a primary product. In such production, all expenditures (excluding direct) are applied to a certain degree to both products.

Taking this into consideration, the following methods of calculating the cost of production can be proposed for AES's with thermal reactors.

1. The exclusion or write-off method. In this method, the cost of the by-product--the intermediate product--is not calculated.

The cost of the spent fuel elements at previously established prices is subtracted from the overall expenditures, depending upon the depth to which the fuel has burned. The remaining figure is applied to the fuel component of the electric-power cost.

The primary drawback to the exclusion method consists of the following. The costs for the spent fuel elements can differ significantly from the actual AES expenditures for the formation of plutonium in the nuclear raw material, since many factors that do not depend on the AES influence the level of these costs. As a result, it is possible that "in certain cases, the fuel component of the cost of electric power can approach zero, and, seemingly paradoxical at first glance, a negative value can arise for the fuel component of the cost of electric power generated at an AES." [3, page 146]. The appearance of such a "paradox" contradicts the labor theory of cost.

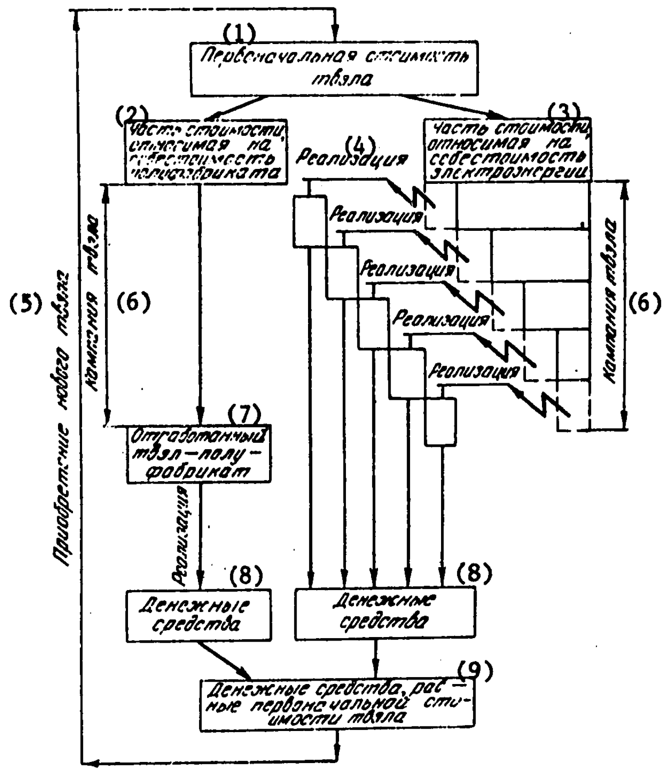
On the other hand, the exclusion method is simple and in principle is not ruled out for application at AES's with thermal reactors where the price levels correspond.

2. The distribution method. Expenditures for fuel are distributed between the electric power and the intermediate product using some criterion,

Such a criterion can be selected based upon the physical nature of the production process: proportional to the amount of neutrons in the core expended on fission and radioactive capture. Or, the criterion can be economic. It can be, for example, proportional to the cost of the commodity output with respect to wholesale prices, or it can be proportional to the average industry cost for each of its products. All remaining expenditures are included in the electric power.

This method is more complicated than the first, but its important advantage is that it makes it possible to calculate the cost of electric power with greater accuracy. Moreover, in this case the possibility of the "paradox" we mentioned arising is ruled out.

At AES's with fast reactors, as was pointed out, the electric power and the intermediate product are the primary products. This predetermines the methodological features of the calculation. In out opinion, the cost of each product must be calculated. This is only possible when the expenditure-distribution method is employed. First of all, it is necessary to distribute the fuel expenditures with respect to a specific criterion.



Hypothetical Diagram of the Movement of Fuel-Element Cost

Key:

1. Initial cost of the fuel element
2. Portion of the cost applied to the cost of the intermediate product
3. Portion of the cost applied to the cost of the electric power
4. Realization
5. Acquisition of new fuel elements
6. Service life of fuel element
7. Spent fuel--intermediate product
8. Cash
9. Cash equal to the initial cost of the fuel element

Another simpler method, however, is possible. If, in the precise-approximation procedure, it is assumed that heat is formed in the core while plutonium is formed in the breeder blanket, then it is logical that the cost of the core fuel be applied to the electric power and the cost of the raw material in the breeder blanket to the intermediate product. Thus method, of course, provides an approximate result. Considering the ease with which it can be applied, we must examine its feasibility. All remaining expenditures can be calculated by a similar method used at TETs's: the direct expenditures and immediately applied to the product with whose generation they are associated. The indirect expenditures are distributed proportional to the values of the fuel and raw-material components of the cost of the electric power and the intermediate product.

When the distribution method is applied, the matter of the relationship between the level of prices according to which the spent fuel assemblies (the intermediate product) are realized and the cost of the intermediate product itself is very important for the economic activity of an AES. Since this price is established based on the necessary expenditures for the production of plutonium (P), three versions of the relationship between its value and the cost of the intermediate product (C_{IP}) are possible in the general case: 1) $P = C_{IP} + P_N$; 2) $P > C_{IP} + P_N$; 3) $P < C_{IP} + P_N$, where P_N is the normal profit for an AES. When the prices established for spent fuel elements correspond to the individual expenditures for production (version 1), AES revenues are insured at the normal industry level.

If the price for spent fuel elements is considerably higher than the cost of the intermediate product (version 2), additional revenues are generated for the AES which are not a result of any improvement in its economic activity. Obviously, the extra revenues must be removed from the budget. Another method can be employed--one can establish estimated prices for spent fuel elements at the level of individual production expenditures at a given AES.

Finally, with version 3, the utilization of a method of expenditure distribution when calculating the cost of production can lead to systematically unprofitable AES operation. In order to avoid this, in the given case it is advisable to use the exclusion method for AES's with thermal reactors, especially since at such a price level the possibility of the indicated "paradox" occurring is eliminated. As far as AES's with fast reactors are concerned, such a method of relating the price and the cost of the intermediate product is doubtful.

Conclusions

1. For an AES operating in an open fuel cycle, the reactor's fuel charge must be considered as part of the fixed assets. Applying the fuel charge to the circulating capital causes a number of problems.

2. The method used to calculate the fuel component must examine the total regeneration of the fuel charge and provide for an accumulation of cash for partial rechargings. In the author's opinion, it is most advisable if the expenditures for partial recharging are written off gradually according to a fixed norm determined for the five-year plan.

3. With regeneration of spent fuel, the fuel charge of a nuclear reactor has a dual economic nature--it simultaneously takes on the roles of fixed and working capital.

In practice, the entire cost of the fuel charge must be included in the AES's fixed assets. The calculation of the fuel component must be made in accordance with this.

4. At AES's with thermal reactors, electric power is the primary product, while spent fuel elements (the intermediate product) are considered a by-product. This being the case, it is advisable to calculate the cost of production using the exclusion method or the method of distribution of expenditures.

5. At AES's with fast reactors, the electric power and the intermediate plutonium product are the primary products. In this case, the calculation of the cost of each of the products must be carried out on the basis of the method of distribution of the overall expenditures.

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ELECTRIC POWER

BRIEFS

ALL-UNION CONFERENCE--An All-Union Conference organized by the USSR Ministry of Power and Electrification, Sverdlovenergo, Uraltekhenergo and the Sverdlovsk Oblast Administration for the Scientific and Technical Society of Electrification and the Power Industry took place in Sverdlovsk. Representatives of leading scientific-research and design institutes, installation and adjustment organizations, manufacturing plants, power stations and power systems took part in the conference's work. At the conference, 45 papers and reports were listened to and discussed. In his address, chief engineer of Glavtekhupravleniye V. N. Timofeyev emphasized that in the coming years the Ekibastuz fuel and power-production complex will be developed further. He also pointed out the urgency of questions associated with the burning of Ekibastuz coal and the set-up and mastery of 500-MW power units. At the conference, operational experience gained from six power units at the Reftinskaya and Troitskaya GRES's as well as the Ekibastuz GRES-1 was covered. The speakers noted that a great contribution to the construction and mastery of power-unit equipment was made by the collectives of the Podol'sk Machine-Construction Plant imeni S. Ordzhonikidze (ZiO); the Khar'kov Turbine Plant (KhTGZ); the Elektrotyazhmash and Sibelektrotyazhmash plants; the Troitskaya, Reftinskaya and Ekibastuz GRES's; Chelyabenergo, Sverdlovenergo, Pavlodarenergo, Glavtekhupravleniye of the USSR Minenergo, the Kazakh SSR Ministry of Power and Electrification, Teploelektroproyekt, the All-Union Institute of Heat Engineering imeni F. E. Dzerzhinskiy, Soyuztekhenergo, the Kazakh Scientific Research Institute of Power Engineering, Kazenergonaladka and enterprises of Glavteploenergomontazh and Glavenergoremont. All power units of the Troitskaya and Reftinskaya GRES's achieved their design-indicator levels. The per-unit expenditure of fuel at the best unit (No. 8 of the Troitskaya GRES) was 328.8 g/kWh. The utilization factor of installed capacity at the No. 8 unit of the Reftinskaya GRES reached 90 percent. The maximum period of uninterrupted operation at the GRES's No. 7 unit was 2,352 hours. In addition, the participants at the conference noted that a number of important matters remain unresolved. The accident rate on turbines has risen considerably in recent times. The low quality of power-unit equipment delivered by plants of Minelektrotekhprom, Minkhimmash and Minenergomash was noted. In a number of cases, there are significant shortcomings in the design documentation. The problem of reducing the harmful nitric oxides released into the atmosphere has not been solved. The conference adopted a further resolution directed at continually improving the reliability and economy of 500-MW units operating on Ekibastuz coal. [Text] [Moscow ELEKTRICHESKIYE STANTSII in Russian No 3, Mar 81 p 78] 9512

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FUELS

MINISTRIES INVOLVED COMMENT ON ROUNDTABLE TALKS ABOUT PIPELINEBUILDING

Moscow KHOZYAYSTVO I PRAVO in Russian No 12, 1981 pp 81-83

[Replies by Deputy Minister of Petroleum Industry Sh. Dongaryan, Deputy USSR Minister of Gas Industry A. Gudz (deceased) and First Deputy Minister of Construction of Petroleum and Gas Industry Enterprises Yu. Batalin to previously published roundtable discussion report: "Work Zealously and Build Economically"; passages enclosed in slantlines printed in boldface; for previous reporting on this roundtable discussion please see JPRS 80205, 1 March 1982, USSR Report Energy, No 91, pp 21-44]

[Text] Information about a roundtable meeting organized by the editors of the journals KHOZYAYSTVO I PRAVO [The Economy and the Law], PLANOVOYE KHOZYAYSTVO [The Planning Activity], MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE [The Supplying of Materials and Equipment] and SOTSIALISTICHESKIY TRUD [Socialist Labor], which was held in Tyumen', and at which questions of the rational use of resources during oil and gas pipeline construction were discussed, was published in the journal's fifth issue this year.

The editorial board is publishing replies that have been received from the Ministry of Petroleum Industry, Ministry of Gas Industry and Ministry of Construction of Petroleum and Gas Industry Enterprises.

/Deputy Minister of Petroleum Industry Sh. Dongaryan/ reports that a large number of urgent problems on whose solution the ministry is working constantly were touched upon in the information that was published.

One of the most important ways to increase capital-investment effectiveness is to concentrate it, to reduce the number of construction projects. The capital-investment concentration that the ministry is now effecting is marked by the following data. While the amount of work performed in 1981 increased by 38 percent over 1978, the number of facilities being erected simultaneously was decreased.

Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], Minnefteprom [Ministry of Petroleum Industry] and Mingazprom [Ministry of Gas Industry] have also unified the dimensional schemes for production buildings for various oil and gas industry facilities. Minnefteprom and Minneftegazstroy design organization specialists have prepared a list of outfitted-modules (BKU's) that are necessary for building the appropriate facilities.

The industrialization of construction, based upon the use of outfitted modules, is a basic Minnefteprom engineering policy. Today's construction volume is unthinkable without further development of the outfitted-module method and the solution of questions that participants of the Tyumen' roundtable meeting spoke about.

/These problems would be solved more successfully if they were included in integrated systems programs formulated by the USSR State Committee on Science and Technology./

Supplying outfitted-module production with the required equipment should be improved. Minnefteprom and Minneftegazstroy are working on solution of the question referred to.

/But also directly connected with this is the overdue need to abolish the USSR Gosstroy decision of 30 December 1976 to include the cost of manufacturing outfitted modules in construction and installing operations volume. The cost of the BKU's, as industrial products, should, in our opinion, be included in equipment costs./

In 1975-1976, temporary prices that were supposed to be reexamined during the mastery of large-scale module output were set for experimental BKU's. However, these prices are still in effect now. In the opinion of specialists of Giprotyumenneftegaz [Tyumen' State Institute for the Design of Oil and Gas Industry Enterprises] of Minnefteprom, they have been overstated by 20-40 percent for various types of BKU's.

Articles produced by Minnefteprom plants in Tyumen' average 25 percent lower in cost than similar output by Minneftegazstroy. USSR Goskomtsen [State Committee for Prices], USSR Gosplan and USSR Gosstroy could participate in solution of the indicated problem.

The roundtable participants expressed an interesting suggestion about including a chapter, "The Organization of the Supplying of Materials and Equipment," in trunk pipeline construction designs. It is desirable to introduce this also into the design for the buildup of oilfield facilities. If USSR Gosstroy produces a positive solution to the question, the erection of facilities for furnishing supplies and equipment to construction projects will be regularized.

The Ministry of Petroleum Industry also considered the proposal of the roundtable participants to grant USSR Gossnab's main regional administrations the right to redistribute above-standard surpluses of equipment and materials that exist at enterprises, regardless of the agency having jurisdiction, to be justified. This will satisfy entirely the task of making rational use of supply and equipment resources that was advanced in 26th CPSU Congress decisions.

The balancing of plans for production and for construction and installing operations in regard to all indicators is a basic for successful fulfillment of the established tasks. Minnefteprom is taking all the steps that are necessary for this. However, it is still not possible to achieve a full balancing. Thus, only the client ministry, not the contracting construction ministries, has to plan the introduction into operation of fixed capital in production construction and of living space in housing construction. This causes great difficulties in the formulation and realization of plans. Minneftegazstroy often breaks down for its organizations tasks for introducing housing into operation that are different from the Minnefteprom planning indicators. Planning organs should firmly adopt the measures called for by the CPSU Central Committee and USSR Council of Ministers decree of 12 July 1979.

/Twice Minneftеprom has examined Minneftegazstroy proposals to build trunk oil pipelines turnkey style, and it considers this possible (in accordance with Minnefteprom designs) in regard to gas-treatment plants and repair plants, production bases, supply bases, and centers for gathering and processing oil and gas./ The turnkey construction of trunk oil pipelines is unacceptable, since all the construction and installing work on the linear portion is concealed, and even where there is constant client surveillance, it is not always possible to get the necessary quality in laying them. In turnkey construction the client is eliminated entirely from surveillance.

In order to coordinate with precision the work to develop the recovery of oil and gas and to build housing and social and cultural facilities in West Siberia, Minnefteprom has created within its central staff a standing current-operations group manned by highly qualified specialists. West Siberian sections have been established within a number of administrations.

In 1985, drilling done by the expeditionary rotating-personnel method in West Siberia will increase 2.6-fold over 1980, and worker manning will be approximately doubled. For those who work under the rotating-personnel regime, a summarized accounting of worktime is being established. Brigade members work, as a rule, on a 12-hour schedule in continuous production work and on a 10-12 hour schedule in noncontinuous production, with the personnel changing each 15 days.

In order to provide for supervision over workers, additional posts for engineers, technicians and workers have been introduced into departments, brigades and other structural subunits. In particular, a second foreman is being introduced into the drilling brigade, and a deputy chief for administration is being introduced into the drilling-administration staff.

/In order to regulate rest time and worktime and to regularize mutual relationships among drilling organizations, the ministry has recently developed the following documents: "Temporary Regulation on the Rotating-Personnel Method of Conducting Drilling Operations," "Instructions on the Procedure for Accounting for Worktime and Time Spent en Route," and "Temporary Regulations on Worktime and Rest Time for Workers Who Work Under the Rotating-Personnel Expeditionary Method." However, there are no interindustry documents on organization of the rotating-personnel method. Obviously, such documents should be developed and approved in the near future./

Minnefteprom is working to introduce the brigade contract widely. For example, as of 1 May 1981, out of 129 drilling brigades in Glavtyumenneftegaz [Main Administration for the Oil and Gas Industry in Tyumenskaya Oblast] 116--or 90 percent--were working under the brigade contract. In Tatneft' [Tatarskaya ASSR Oil Production Administration] all drilling and construction brigades are under contract. Altogether, 164 brigades converted to the brigade contract in 1980, 260 brigades in 1981.

With the severe shortage of labor resources in West Siberian Oil and Gas Complex areas, the role of centralized sources for furnishing workers to enterprises is growing. USSR Gosprofobr [State Committee for Vocational and Technical Education] should solve more rapidly the problem of the possibility of sending PTU [vocational and technical school] graduates from the various regions to West Siberia's oil-industry enterprises.

/Considering the importance of the West Siberian Oil and Gas Complex, it is desirable that USSR Gosplan, USSR Goskomtrud [State Committee for Labor and Social Problems] and USSR Gosprofobr authorize West Siberian oil-industry enterprises to perform the selection and training of workers in Minnefteprom-system educational institutions that are located in other parts of the country./

The ministry has charged appropriate subunits, enterprises and organizations with considering the proposals for practical work that were expressed at the roundtable meeting.

/Deputy Minister of USSR Gas Industry A. Gudz (deceased)/ noted that his industry has attentively analyzed the information from the roundtable meeting. Insuring that deadlines are met for high-quality construction and for the introduction of gas-industry facilities into operation, and, in the final analysis, that established tasks for recovering and transporting gas are fulfilled, depends to a great extent upon the precise solution of the questions raised.

Some Minneftegazstroy construction and installing organizations are not insuring fulfillment of established tasks for introducing production capacity, housing and facilities for social, cultural and domestic-amenity purposes into operation.

The Ministry of Gas Industry, for its part, is doing everything possible to reduce uncompleted construction. The plan for the current year includes the construction of 44 fewer facilities than in 1980. Ninety-one percent of the capital investment allocated is aimed at construction projects that are due for early startup. This will help to reduce the amount of uncompleted construction by 400 million rubles in 1981.

/The ministry recently developed and sent to Minneftegazstroy for coordination a draft of "Regulations for the Turnkey Construction of Gas-Industry Enterprises (and Structures)," which was approved 13 October 1980, and putting the indicated document into effect will provide for actual conversion to the construction of facilities on the basis of this principle./ Turnkey erection of the industry's facilities will enable capital-investment effectiveness and the motivation of prime contracting organizations to introduce facilities into operation to be raised.

/First Deputy Minister of Construction of Petroleum and Gas Industry Enterprises Yu. Batalin/ reported that the ministry has examined the report about the roundtable meeting, and it considers that questions of making rational use of material and labor resources during the construction of trunk pipelines are urgent in the highest degree. In July 1981 these questions were discussed at a session of the board and at a ministry party meeting.

"The Main Directions for the Economic and Social Development of the USSR During 1981-1985 and During the Period up to 1990" calls for implementation of a program for boosted development of gas recovery, by accelerating the assimilation of West Siberian gas fields. Realization of this program will be based upon broad use of the newest achievements of science and technology, the fulfillment of industry and interindustry systems programs, the introduction of progressive methods for organizing the performance of construction and installing work, and the use of effective technological decisions through the whole construction cycle--from design to the introduction of facilities into operation. The ministry is taking concrete steps to carry this out.

More rational routes for laying trunk lines have been planned, jointly with Mingazprom, and questions about building them in one corridor have been solved. The main rules about organizing the construction of trunk gas pipeline systems by large flow-line operating groups, using the shuttle method, have been worked out. This will permit the time lost by redeployment from job to job to be precluded, preparatory operations to be carried out in good time, and housing settlements with the amenities to be created for the builders of compressor stations and for the linear flow-line groups.

The outfitted method of construction will be further developed. Thanks to its use, labor productivity during the last 5 years for "on-ground" construction was raised by 23 percent, and the average time for erecting compressor stations was reduced 30 percent. This year more than 63 percent of all work on the building of compressor and pump stations, installations for the integrated processing of oil and gas, and other gas and oil industry facilities will be carried out by the outfitted-module method.

/The ministry is at present formulating an industry program to improve systems for the delivery and use of pipe./ Organization supervisors have been vested with personal responsibility for the use of pipe and other equipment. Intensive work is being done to save electricity and heat and to suppress cases of wastefulness. Organizations and enterprises of the industry have committed themselves to saving 11,000 tons of rolled metal, 25,000 tons of cement, 7,200 tons of standard fuel equivalent, and 20 million kw-hr of electricity in 1981.

/The ministry has developed a master scheme for managing the construction of oil and gas industry enterprises. It will enable systematic acceleration in the pace of erecting trunk pipeline systems, building up gas field and oilfield facilities, and constructing cities and settlements of West Siberia in integrated fashion./

The industry is taking a number of steps to improve the organization of pay. A third of the total construction and installing work volume has been carried out by the brigade-contract method. As a result of introducing this method, construction effectiveness has been raised, and the time taken to erect the most important facilities has been reduced.

/The board's ministry and the Central Committee of the Trade Union of Oil and Gas Industry Workers have approved a specific program for developing and improving the brigade contract in Minneftegazstroy organizations during 1981-1985. By the end of 1981, 40 percent of all the work will be done by contract brigades./

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BOOK DISCUSSES NEW METHODS FOR IMPROVING RECOVERY OF OIL, GAS, GAS-CONDENSATE

Moscow DOBYCHA NEFTI I GAZA in Russian 1981 (signed to press 23 Sep 81) pp 1-4, 384

[Annotation, foreword and table of contents of the book, "Oil and Gas Recovery," by Yuriy Vasil'yevich Zaytsev and Yuriy Ayrapetovich Balakirov, Nedra, 4,400 copies, 384 pages]

[Text] A set of questions associated with drilling into the pay, completing and studying wells, and operating oil, gas and gas-condensate fields and with the equipment and technology for recovering oil and gas is set forth.

Methods for recovering oil and gas and for raising well productivity in the environment of the country's northern regions and offshore fields are examined. Light is thrown on the chief directions of the work to preserve the environment during the drilling and operation of oil, gas and gas-condensate wells, and the prospects for developing the oil and gas industry are determined.

The book is for engineers and technicians of the oil and gas industry. It will also be useful to students of petroleum vuzes and departments.

There are 97 tables, 172 illustrations and a bibliography of 50 items.

Foreword

The Accountability Report to the 26th CPSU Congress stated: "...the successes of the whole national economy will depend greatly upon an increase in the effectiveness of the extractive industries. The way to do this is to accelerate scientific and technical progress...."

Improvement of the equipment and technology for operating wells (in combination with the various progressive processes for stimulating the formation) is the most effective, accessible and high-speed method for increasing the formation's productive capacity. Unlike intraformation processes for stimulating the formation in order to promote the flow of fluids, the use of the potential possibilities of the well itself will enable a planned increase in the output of hydrocarbons to be obtained with few resources and in a much shorter time. Obviously, it is also impossible to ignore intraformation processes for stimulating the collector; on the contrary, only with creation of the best conditions for the movement of fluids in the formation can flow from the well be intensified.

During the last two decades new means for lifting the formation liquid from wells, taking various oilfield-geology and climatic and geographic factors into account, and new methods for stimulating the bottom-hole zone of oil, gas and gas-condensate wells and for preservation of the environment in oil and gas recovering regions have been tested and introduced at the industry's oil and gas recovery enterprises. Much experience in developing and operating offshore oil, gas and gas-condensate fields and wells has been gained in our country and abroad.

The authors have striven to focus the reader's attention mainly on that information that has not been generalized in publications of this nature, and, of course, they have tried not to repeat information that has been published in recent years.

The authors set themselves the extremely extensive and important task of setting forth systematically a whole complex of questions associated with recovering oil and gas. This task is extensive because one has to examine the whole technological sequence of the basic method for recovering oil and gas, questions of design and optimization and of technical and economic evaluation when forecasting operating methods, and so on.

The authors express gratitude to their readers who will consider it necessary, first, to introduce the information about the most effective and new methods and ways for recovering oil and gas at their own production sites or to use the information when preparing scientific and design documentation, and second, to express their desires and comments about the book they have read.

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