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## INFLUENCE OF NORMATIVE RESERVE AND DEMAND ON POWER ON PROCESS OF JUSTIFICATION OF GENERATING SOURCES AT UES OF RUSSIA DEVELOPMENT MANAGEMENT

Planning the development of the electric power industry at all times is associated with the formation of power balances UES of the country. The work "Scheme and Program for the Development of the UES of the Country for a 7-Year Period" (SaPD UES) contains the input and expenditure parts of the power balance. The expenditure side of the balance is determined by the demand for capacity and includes three components: the projected maximum load, export / import of capacity, and the normative capacity reserve. The forecast of the maximum hourly consumption of electric energy is formed on the basis forecast of power consumption in the territories constituent entities the Russian Federation for conditions of long-term average outdoor temperatures, as applied to December. The normative (full) power reserve depends on many factors, including those accidentally determined. Its substantiation is based on the solution the problem of assessing balance sheet reliability indicators for the maximum load December days in relation to SaPD UES of Russia with the allocation territorial reliability zones in it. For these purposes, various methodological approaches and mathematical models are used [1-4]. The values of normative (full) power reserve are given in methodological recommendations (MR) for designing the development of energy systems. Their latest version [5] was approved by the Ministry of Energy of Russia back in 2003 and requires updating.

Today, unlike the pre-perestroika period, the UES of Russia is characterized by significant excesses of capacity. Therefore, the task of determining the normative reserve of power in the long-term planning of the UES of Russia should be considered in a completely different plan related to the selection of the most efficient equipment and further dismantling morally obsolete equipment. The task of substantiating the inputs of generating equipment in modern conditions is carried out when solving the problem power supply contracts (PSC). The selection of the most effective, including taking into account the solution PSC problem, is the result implementation of competitive bids during the competitive power selection procedure.

The implementation changed conditions for functioning of energy systems required the development the Regulation on the procedure determining the value of demand for capacity and the Wholesale Market Rules . These regulatory documents seriously contradict the Ministry of Energy approved by the Russian Federation [5]. This applies to the planned capacity reservation coefficient (1.17), predicted underutilization of capacity, taking into account the influence temperature factor and taking into account the limited production of electricity by hydroelectric power plants in dry years. This can be explained only by the incompetence of specialists preparing these regulatory documents. Unfortunately, experts from academic and university science, as well as industry institutes that are competent in ensuring the balance reliability, were not involved in their preparation and examination.

It should be noted that the updating MR 2003 was undertaken back in 2011, that is, almost immediately after the start of work SaPD UES and the approval of the regulatory documents noted above. On the instructions of JSC "SO UES", JSC "Institute ENERGOSETPROEKT", with involvement of specialists from research institutes, a new edition MR was carried out taking into account the changed conditions . In it, on the initiative customer significantly overestimated the values one of the components normative reserve of power - the reserve for scheduled repairs equipment. With the launch capacity market, the standards for duration and frequency of repairs have lost their normative role. In modern conditions, the magnitude decrease in power due to scheduled repairs in the autumn-winter period is determined by the capabilities of energy companies, taking into

account the mode-balance situation in the power system. This leads to a significant increase repair component in relation to principles of its formation that existed until 2006. In the European part UES - to double from 4-5% to 9-10%, in Siberia to triple (from 4% to 12%). With this in mind, the normative values power reserve in developed new MRs were brought up to 20.5% for UES of Russia as a whole and up to 22% for Siberia. In such edition they were not approved by the Russian Ministry of Energy. At the beginning of 2018, the Ministry again initiated work on the procedure determining the normative reserve of capacity. Unfortunately, work for almost a two-year period has been carried out by the ISEM SB RAS. At the same time, it is not publicly discussed either on the STC UES of Russia or in any scientific and practical publications.

Based on the analysis retrospective information, the article gives the results of deviations planned values of maximum loads and electricity production at hydroelectric power plants from their actual values. The article discusses the details contradictions identified as a result of the analysis regulatory documents mentioned above and their consequences when substantiating the demand for power and one of its components, the normative reserve of power. The methodological principles accounting the energy supply of hydroelectric power plants are substantiated from the standpoint of substantiating backup means. Practical results influence the identified inconsistencies in the mentioned regulatory documents and the observed deviations predicted parameters on the value of demand for power during the competitive power take-off procedure are presented.

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