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CURRENT PROGRESS ON THE CREATION OF AN INTERNATIONAL NETWORK OF REMOTE PARTICIPATION CENTERS IN THE ITER EXPERIMENT *)

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ITER is a large collaboration consisting of seven equal partners and more than thirty participating countries. Equal access to the experiment and its results for all project participants is one of the difficult and ambitious tasks facing this collaboration. For its implementation, the possibility of remote access to the installation data collection and storage system is provided.

To develop technologies and principles of interaction between the ITER site and other project participants in the Russian Federation, a model of a Remote Participation Center (RPC) was created. Together with the International Organization (MO) ITER, a study of data transmission processes is being conducted, as well as connection to the internal networks of the ITER MO from the point of view of information security.

In order to test and compare different types of channels in order to develop standards for collaboration, tunnels of different levels (L2, L3) were built. Test for approach solution that ensures a stable connection to the site and ensures the required data exchange rate between the ITER IO and the Remote Participation Centers was done. The result of this work is standards for connecting participants.

Work is underway to form the appearance of the Remote Participation Center for the experimental program. Solutions for virtualization of control terminals are being tested. Based on the variables of the data collection system, various methods for visualizing the state of subsystems in real time are being developed: from the development of specific operator screens to the most modern approaches associated with the use of 3D visualization technologies.

At the moment, the ITER IO for the needs of future experiments, organized 2 dedicated backup fiber-optic channels from the site to Marseille (approximately 80 km away) with a total throughput of 2×400 Gbit/s. Marseille is an international hub with hundreds of Gbps of capacity for public and private network providers. As a result, an ITER network node has been created today in one of the Marseille data centers. The Russian RPC was the first to be connected via this new facility. Overall, the existing infrastructure appears to be sufficient to support at least the next ten years of ITER commissioning and operation.

A network of RPC is currently being deployed among the partners. Russia and Japan already have permanent Remote Participation Centers. Four partners (the United States, the Republic of Korea, the People's Republic of China, and the EU) have been connected using temporary agreements and a limited set of resources on the remote side (the so-called "model RPCs"). At the moment, the Remote Participation Center located at the ITER Project Center (Troitsk) is the most advanced in terms of available functionality.

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