

§6. Research on History of Fusion and Plasma Research Devices

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Background and Objective:

In the field of fusion-plasma research, new and innovative research devices which had not existed by then in the world were built at each step of the research, and by using such new devices new phenomena have been found and analyzed. Researches in this field have been progressed this way. Therefore, historical documents on plasma research devices, themselves, mean the history of fusion and plasma researches.

When the size and cost of a device become larger and more expensive, not only scientific aspects but also political aspects become effective. However, it is tried to limit the view angle only to scientific and technical aspects in this historical research. The objective is to collect and arrange documents / materials on research devices.

During the last fiscal year of 2005, as the first year of this collaboration research, documents on RFC-XX / RFC-XX-M of NIFS and JTF-2a of JAERI were arranged. By those two sets of documents, the standard format of the archiving has been established.

During this year of 2006, time available was not enough for this history research, unfortunately. Instead, a rare and excellent historical material made in Russia became available. Because Russia was the frontrunner of fusion research in the early period, the Russian material is strongly related to this research. So, the material would be used as the research result.

Contents and Results:

The material available this year is recorded in a DVD titled as 'Global Energy' made in Russia under guidance of Dr. Lev Golubchikov who had been the Contact Person of the ITER Council on the Russian side. The DVD contains a number of photos and movies on fusion research in Russia since its very early stage. The DVD is composed of three sections.

Section 1: The very early activity of Russian research on fusion theory and of utilization of fusion energy is described. Photos and movies of the key persons of these years, G. Gamov, N. Bkharin and others are contained. There are a movie showing young I.V. Kurchatov working as a communication soldier and another movie of aged Kurchatov with beard as his statue at the entrance of the

Kurchatov Institute, too. The inventors of Tokamak, A.D. Sakharov and E. Tamm, are also shown. Photos of the famous Tokamak, T-3, T-7 that was presented to China and is working at Hefei, larger Tokamaks T-10 and T-15 are also contained. It is a pleasure to see photos and movies of famous researchers who are authors of the well-known Russian fusion text book, 'Plasma Physics Series'. One of those, V.D. Shafranov explains their work using famous cartoon by his son. At the end of the section 1, we can see a movie of the international conference in Salzburg in 1961 that is thought to be the starting point of the world fusion research.

Section 2: Photos of stellarators, multipoles, pinches and machines of other types are shown. The famous international collaboration on T-3 in 1968, with R.S. Pease of Culham Laboratory together with L.A. Artsimovich, B.B. Kadomtsev, K.A. Razmova, V. Strelkov and others can be seen in a movie. Photos of ST-Tokamak and PLT of the Princeton Plasma Physics Laboratory, and Italian devices are also shown. The author of this report regrets that there is no Japanese device included even though there were several high-performance devices such as JFT-2.

Section 3: Movies on ITER project since its start of talk of M. Gorbachev with F. Mitterrand and next with R. Reagan in 1985. The DVD ends with a movie of the meeting in Paris on November 21, 2006 where the construction agreement of ITER was signed.

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