

§1. Archival Study on Development of Heliotron Devices

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"Fusion Science Archives" of National Institute for Fusion Science has promoted archival activities about the nuclear fusion studies that have been performed at universities in our country.

This archival study is focused on the fusion oriented high temperature plasma experimental devices developed and constructed in the universities, especially on the series of Heliotron devices, which have been originally proposed and developed in Kyoto University by the late professor emeritus of Kyoto University, Koji UO [1].

After the proof-of-principle experiment in Heliotron E (Kyoto University), the Helical-Heliotron concept is now in its parameter expansion phase and a lot of remarkable results have been obtained through the LHD project in National Institute for Fusion Science (NIFS). On the other hand, in Kyoto University, a new generation of the heliotron concept, Helical-Axis Heliotron configuration [2], was proposed by the Kyoto group and has been experimentally examined its basic idea through the Heliotron J project in Laboratory for Complex Energy Processes, Institute of Advanced Energy (IAE), Kyoto University under the auspices of the NIFS Collaborative Research Program.

The aim of this archival study is comprehensive and systematic collection of the research materials on each heliotron device. The materials about technical notes in R&D phase of machine construction and of control sequences are also the targets. By the collaboration with "Fusion Science Archives" since 2007, collection of scientific materials about heliotrons is in progress. By 2008, a present situation of a series of heliotron devices has been investigated, and some documents of each device were confirmed. In 2009, the minutes of technical meetings with the manufacturer in each device and the records of the malfunction in operation and countermeasure are also added in the archive. We have started to make a microfilm collection of large size drawings for the Heliotron E device and its relating equipment since 2009.

In 2010, some documents were discovered in the unexpected places, like a pipe space in the Heliotron building. Those documents are under investigation to identify their origins. Some videotapes were also discovered. Although there is no record showing the time and place that

the movies were taken, one of them is probably taken on the occasion of test assembling of the Heliotron E device in a factory. The others are perhaps the discharge records in early period of the Heliotron E experiment. Because the condition of these tapes is not so good, we decided to make digital copies of these records to save them.

On the other hand, we and other archival groups discussed how to incorporate the archival records into the documentation system of each organization in the second Natural Science Archives Meeting held in National Institute for Fusion Science on February 2, 2011.

[1] K. Uo, at Kakuyugo-Kondankai (May, 1958).

[2] M. Wakatani, et al., 17th IAEA Fusion Energy Conf. (Yokohama, 1998) IAEA-CN-69/EX2/5.



Some video captures from one of the discovered videotape records.