AOARD REPORT

National Institute for Fusion Science in Nagoya

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S. J. Yakura
AOARD

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AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

ASIAN OFFICE OF AEROSPACE RESEARCH AND DEVELOPMENT

TOKYO, JAPAN
UNIT 45002
APO AP 96337-0007
DSN: (315)229-3212
Comm: 81-3-5410-4409

To: Dr Shiro Fujishiro
From: Dr S. Joe Yakura

Date: 12 Apr 93

Subject: Trip Report - Nagoya University, 9 Apr 93

ABSTRACT:
The National Institute for Fusion Science, operated by Monbusho inside the Nagoya University campus, was visited. The current major research activity is focused on a new fusion reactor design concept called Heliotron. The research goal is to build a bigger Heliotron device and achieve DT reactions by the end of 1997. Currently, hydrogen plasmas are used in the existing small Heliotron device to obtain good data for the future design of the large Heliotron device.

Purpose: Visit Prof Kojiro Nishina of the Nuclear Engineering Department at Nagoya University and discuss energy research and policies in Japan.

Time of Visit: 1100 - 1750, Friday, 9 Apr 93.

Place: Nagoya University, Japan

Observations/Comments:

- Nagoya University is located only 20 minutes walk from Motoyama subway station on the Higashiyama subway line. The university is one of the 95 Japanese national universities under the jurisdiction of the Ministry of Education, Science and Culture (Monbusho). From Nagoya JR station, it took around 30 minutes to get to the Nagoya university campus. There is a bus stop that took me right in front of the campus.
- The Nuclear Engineering building is located at far end of the campus up in the hilltop, overlooking the most of the campus (Engineering Building #6). Right next to the engineering building, there is the National Institute for Fusion Science that is operated by Monbusho. With the introduction from Prof K. Nishina, I had a chance to talk with one of associate professors, Prof Akio Sagara. Prof Sagara is one of the group leaders for a new fusion reactor design called Heliotron. He took me to the building where two experimental fusion devices are housed. One is the Heliotron device and another one is the Tokomak. He said that this research center made a decision to pursue further research in the Heliotron concept and stop the Tokomak research effort. Their present goal is to build a bigger Heliotron device and achieve DT reactions in 1997. Currently they are shooting 100 shots with the existing compact Heliotron to establish a good data base for the future design of the large Heliotron device. Each shot is roughly 100 milliseconds long and hydrogen is used for a plasma source.
- Prof K. Nishina is coordinating the foreign exchange

program with the university of Michigan. It might be useful for us to establish some sort of the faculty exchange program with Nagoya University through Prof Nishina. I explained to him about AFOSR's US-Japan technology management program and our association with Prof Campbell who is heading the AFOSR program at Michigan. He said he is interested in participating in our program in connection with the University of Michigan's foreign exchange program. He told me that the university has the constitution that states Nagoya university shall not get involved on any defense related activities (I actually had a chance to read the constitution as I was walking going out of the university). He said other national and private universities and colleges have taken the same attitude toward defense research, even for such research as basic scientific research that has no direct applications toward weaponization. This type of attitude makes very difficult for us to establish a good working relationship with us. He said if professors are getting support from any defense agencies, they need industrial connections to justify their research work from public scrutiny. Having done research in nuclear science, Prof Nishina really understood the intricacy of getting support from defense agencies and at the same justifying his research work to the Japanese scientific community.

- At Nagoya University, 52% of the undergraduate students are majoring in science and engineering. Compared with most of the US universities, this percentage very high. At the Master's level, the percentage is even higher at 77%. This might be a good indication of the growth of the Japanese industry since the end of World War II.