§3. Effects of Monbusho's Grant-in-Aid in Promoting Nuclear Fusion Research in Japan

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Introduction

Japanese research activities on nuclear fusion study had been supported within a dual scheme of funding system, i.e., by university budget through Monbusho (Ministry of Education) and by atomic energy budget through STA (Science and Technology Agency) until their reorganization in 2001. Since in any field of science the promotion of university-based research activities should be of vital importance for the future, Monbusho had set up a Grant-in-Aid system for Scientific Research, called "Kakenhi," for science general, including nuclear fusion. We would like to follow the effects of Kakenhi on fusion research in various phases of science-policy interface in last century by the use of archival materials.

Features of Kakenhi in relation to fusion research

[1] Sogo-Kenkyu (Co-operative Research)

This category of Kakenhi was first applied by Prof. Yukawa, H. for 3 years (1958~60), and successively by Prof. Husimi, K. for 2 years (1961~62) in the earliest phase of fusion research in Japan. The granted amount was 33.4M¥ in five years (mean annual = 6.68M¥/y), and used mainly to organize the nation-wide fusion researchers' community, Kakuyugo-Kondankai, through information exchange and meeting proposals as well as assistance for research expenses. It was quite effective to bring up the co-operative community.

[2] Tokutei-Kenkyu (Research on Specific Areas)

This Grant-in-Aid should be used to breed up the researches of important and growing issues in the specific area for up to 3 years. Nuclear fusion and related titles were designated as specific area four times, with 5-year intermission,

(1963~65):"Nuclear Fusion" by Prof. Husimi,K. 96.0M¥/3y
(1966~71): <Intermission: Frosty Season>
(1972~74): "Nuclear Fusion" by Prof.Takayama,K. 568.5M¥/3y
(1975~77):"Basic Research of Nuclear Fusion Technology" by Prof. Takayama,K. 1357.8M¥/3y
(1978~79): "Materials and Tritium for Fusion Reactor" by Prof. Sekiguchi, T. 32,3M¥/2y

[3] The hard time for fusion research

The 5-year intermission of Tokutei-Kenkyu is usually referred to as "Frosty Season" for the fusion community, and various efforts had been paid to overcome the difficulties.. This was quite a bitter and instructive lesson for the community. It might, however, be mentioned that some additional factor concerning Kakenhi system did exist in those days, i.e. the dispute between SCJ (Science Council of Japan) and SCM(Science Council of Monbusho), on the screening processes, and others.

[4] Subjects and item classifications in Kakenhi

When a branch of science is developed, its disciplinary scope will be largely changed from the original one and sometimes it may merged with the neighbors to form quite a new field. In the Kakenhi scheme this had been the case. The item classification scheme of Kakenhi is defined as, Field (*Kei*), Area (*Bu*), Division (*Bunka*) and Section (*Saimoku*). [English names given tentatively] Early in 1978, a new Division of "Plasma Science and Technology" to deal with newly-met complexities in plasma behaviors in wide ranges of nature, within "Composite Area".

Furthermore, in 1992, at the revision of classification list, recent development of nuclear fusion researches resulted in the establishment of a new Section of "Nuclear Fusion Science", within "Energy Science" Division, in parallel with the Section of "Energy Science in General and Atomic Energy".

Both of Plasma Science and Nuclear Fusion Science would be very promising fields of research issues.

[5] Tokubetsu-Kenkyu (*Special Area*: Fusion Research)

This category was set for systematic and necessary development in view of the nuclear fusion reactors. The research program was characterized by its large annual budget (~750 M¥/y) and long duration term of 10 years. The whole system of research operation were actually composed of 5 to 6 divisional groups, each contained 3~5 selected programmed issues as well as several openly proposed ones from outside researchers, together with a general steering committee. The total operating term of the project was divided into 3 sub-periods. Prof. Uchida, T. was in charge of the program execution for the first 9 years (1980~88), and Prof. Ikegami, H. succeeded for the last year (1989), with editing the scientific reports (1990)

The most important and prospective achievement of this Tokubetsu-Kenkyu could be said that the actual reactor technology studies indispensable in the future progress had commenced just in cooperation with plasma physics research attainments, and many young scientists took their interest in this field. < NIFS09KVXJ013 >