

UTILIZATION PROGRAM OF HANARO UNDER IMF SITUATION IN KOREA

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ABSTRACT

Some of utilization facilities in HANARO are still being installed and among them CNS and FTL are yet in the design stage. This kind of situation in HANARO was mainly caused by the shortage of total budget of the reactor project during the period of reactor construction (1985 ~1994). Installation of remaining utilization facilities to be equipped after HANARO construction had to rely on the resources of the long-term nuclear R&D program. The program commenced in 1992 with the 10-year implementation plan. It stipulates to be revised every 5 years in order to reflect changing national and international nuclear circumstances. The original nuclear R&D program (1992 ~ 2001) set up in 1992 was amended in 1997 to establish nuclear policy infrastructure and to strengthen technological self-reliance in nuclear power. In this amended long-term nuclear R&D program (1997 ~ 2006), full scope of utilization facility in HANARO was accommodated. However, economical difficulty befell to Korea from the end of 1997 and every social structure in Korea had to be reshaped with top priority of productivity base. Every industrial sector was desperately striving to cope with the financial difficulty by utilizing maximum production efficiency and by minimizing other functions or activities, which are not directly related to production activity. Even though nationwide endeavor strenuously to get over the economical difficulty, the government had to be supported from IMF (International Monetary Fund). Under the IMF situation in Korea, the nuclear R&D program must be adjusted due to cut-down of research fund from the government. Consequently utilization facility of HANARO is to be evaluated based on the users' program and their requirements. According to the evaluation results from the users' conditions, among the HANARO utilization facilities the first priority is pointed to be RI production facility, the second is to be neutron scattering facility, the third to be fuel and material testing and the fourth to be neutron activation analysis facility. Installation of new facilities, which require relatively huge amount of research fund such as CNS and FTL are decided to be postponed for 3 ~ 4 years.

INTRODUCTION

HANARO is operating at 20MWt, about 70%FP to meet the demand of RI supply which is dominating over other requirement. This operating condition is expected to be continued for 2 more years until competitive utilization program being raised from other users' group. Among the utilization facilities such as neutron beam instruments (SANS, PNS, TAX), BNCT facility , fuel irradiation capsules and RI facilities, some are presently being installed into HANARO and others are in design stages. Installation of facilities is funded from the resources of the long-term nuclear R&D program. The program is composed of 7 research fields: 1) nuclear reactor technology, 2) nuclear fuel cycle technology, 3) radioactive waste management, 4) nuclear safety, 5) radiation / RI application, 6) radiation protection, and 7) basic technology. HANARO utilization program is included in the 7th research field, basic technology. Economical recession which blew down over the country since the end of 1997 forced the budget of government-subsidizing research projects to be cut down to much less amount than minimum required, even though the research programs themselves were not reduced. Consequently, in case of HANARO, the priority of installation for utilization facilities was set up based on the extent of user's demand majority of users for each facility and on the amount budget of required for its installation

THE SURVEY OF USER'S DEMAND FOR HANARO FACILITIES

If the users group or community lead the main role of HANARO utilization for their basic and applied research activity, and then initiate the role of selection and installation of future facility in HANARO for the competitive advanced research purposes, it will be very desirable. To make this kind of phenomena, it was first step to recognize what the real situation of users community is and what the main requirement or prospect of the community for their research purposes are. For this purpose, we prepared for the utilization programs and user's checking point for him to choose his interesting program and facility of each research fields by using existing and future utilization facility of HANARO and distributed the utilization programs checking sheet to universities, institutes, and industries over the country through mailing system and Internet for 4 months (from May to August, 1998). To these programs, about 1,200 users as a group or single from different organizations responded their or his research intention to the programs and they shown utilization demands for the facility in HANARO. According to the survey, about 43% of total number of users responded are from universities, 28% from hospitals, and third large group is institutes with 16%. The survey also revealed users' demand for the utilization facility as 32% of total utilization demands are in neutron beam facility, 24% in RI production, 13.5% in irradiation testing, 12.6% in NAA. New facility such as CNS and BNCT are relatively low for their users' demand due to the lack of experience in these facility. Following table 1,2 are the results of the survey:

Table 1. Users

Organization	Number of User	Rate (%)
University	507	42.9
Hospital	334	28.3
Research Institute	190	16.1
Industry	119	10.1
Government Corporation	20	1.7
Others	11	0.9
Total	1,181	100.0

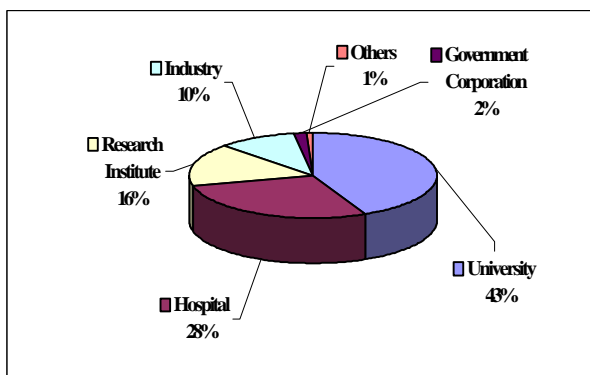
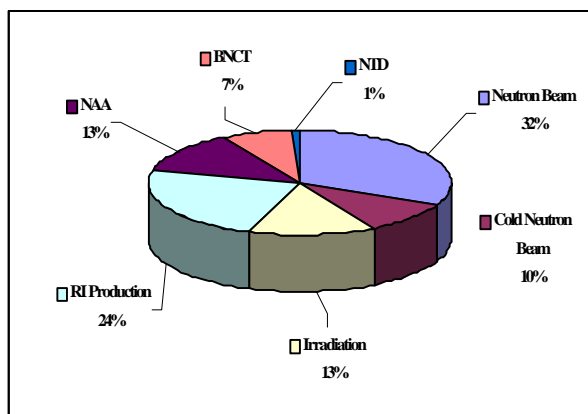


Table 2. Facilities

Utilization	Cases of Demand	Rate (%)
Neutron Beam	1,075	31.9
Cold Neutron Beam	331	9.8
Irradiation	455	13.5
RI Production	811	24.0
NAA	425	12.6
BNCT	250	7.4
NTD	27	0.8
Total	3,374	100.0



Consequently, the utilization facilities of HANARO were selected with the priority from the base of users' condition and followings are the results of selected facilities to be installed during the period of 1999 to 2002 :

- 1) RI production facility :
 - new facility to be equipped, presently in design stage : fission Moly facility, generator loading facility
 - existing facility : concrete hot-cells (4units), lead hot-cells (17 units), GMP clean room
- 2) Neutron beam facility :
 - new instruments under installation: SANS, PNS, TAS
 - existing instruments : HRPD, FCD, NRF
- 3) Irradiation testing facility :
 - new facility in design stage : instrumented fuel irradiation capsule
 - existing facility : instrumented material irradiation capsule, non-instrumented fuel irradiation capsule
- 4) Neutron activation analysis facility :
 - existing facility : PTS 3 set (manual : 1set, automatic :2 sets)
 - gamma-ray counting system : 6 sets
- 5) BNCT facility :
 - exposure room : under installation
 - neutron irradiation facility : mock-up testing

Facility such as CNS and its guide hall, which require relatively huge amount of installation budget were put off to the 2nd phase (2003 ~ 2006). During the 1st phase (1999 ~2002) of the R&D program, the emphasizing focus will be on the enhancement of users' utilization programs and of the increasing usage for each facility.

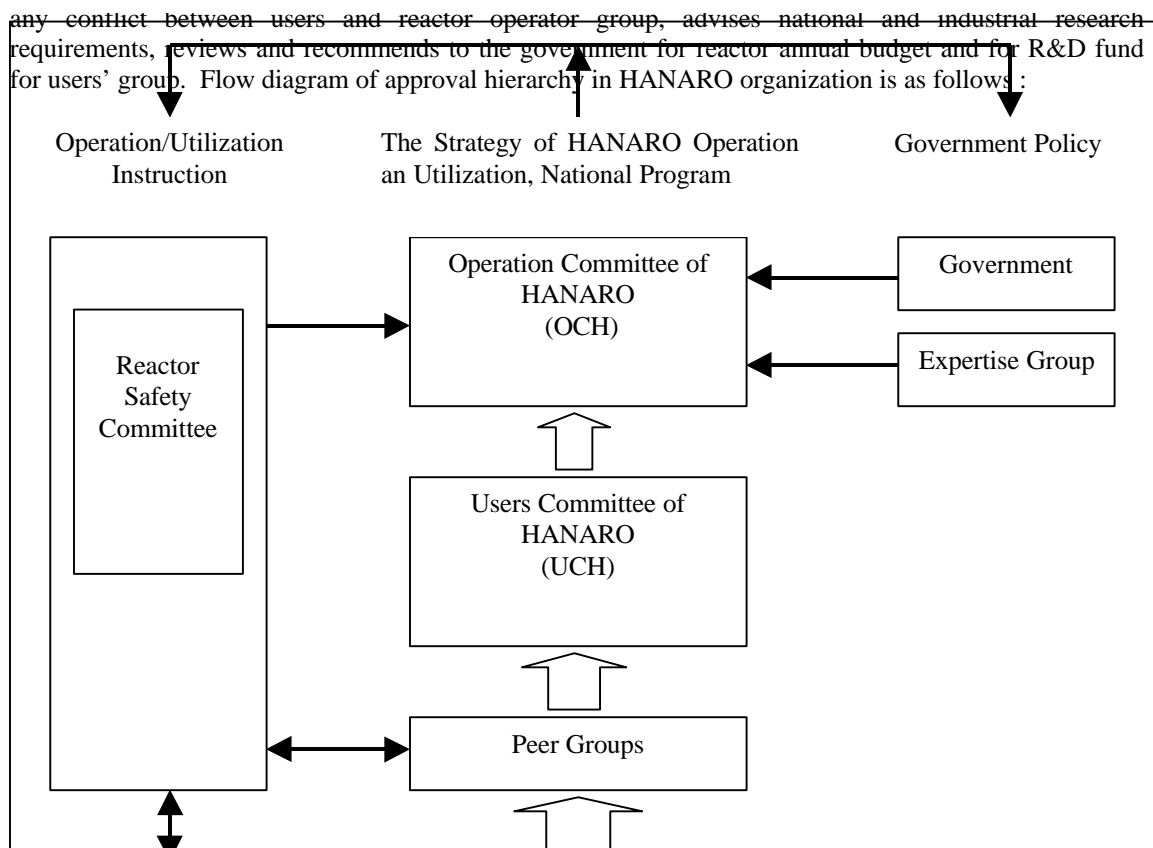
ENHANCEMENT OF USERS' PROGRAM

To enhance the utilization of HANARO facilities, two different ways were suggested to implement properly. The first method is to allocate special research fund for the encouragement of researchers using HANARO facilities. The government concern has approved for this method. The second way is to renovate the management system and utilizing mechanism of HANARO. For the first step of this method, peer groups were organized for each discipline such as fuel irradiation testing group, material irradiation testing group, neutron beam users groups, RI users groups, NAA users groups, and BNCT developing group. The purposes of organizing peer groups are to support for users to utilize facilities effectively and to maximize the convenience of users for them to draw their desires for the utilization of facilities. For this purposes, following requirements from peer groups were raised to be set up and operated :

- operation procedures for each peer group
- enhancement program for each peer group
- user training programs for each peer group
- information exchange system between users
- consulting committee for advanced research
- review committee for the evaluation of users' research results
- adjustment committee for the conflict between user and reactor operator
- advisory committee for the implementation of national and industrial research requirements.

Each peer group is operated independently and 2 ~ 3 representatives are selected from each peer group and those selected representatives from the peer groups are to be the member of Users Committee of HANARO (UCH). UCH is to develop utilization enhancement program, user training program and to organize review committee for the evaluation of users' research results and their application for the usage of facilities. The top authority among the HANARO organizations is in Operation Committee of

Table 3. Flow Diagram of Hierarchy in HANARO Organization



CONCLUSION

Even though national effort to phase out the country from the IMF situation has made the situation much progress, economical strain over the country still puts stress on the research programs. Under the situation, KAERI decided to categorize the installation of utilization facilities in HANARO with the priority by means of users' demand majority for each facility. For the period of first phase (1999 ~2002) of the long-term nuclear R&D program, enhancement of utilization program for the facilities will be more emphasized. For this purpose, supporting services and utilizing mechanism of HANARO will be renovated continuously. The new facility to be installed in the 2nd phase (2003 ~ 2006) of the program is supposed to be decided according to the utilization results revealed during the 1st phase of the Program. Consequently, the paradigm of research environment in Korea is slowly being changed from the suppliers' leading role to the users' leading phase. It means that users' research field is being extended continuously. The problem, however, still to be resolved is users' unchanged attitude that they don't want to pay for the fee of facility utilization.