

ANRE Intends to Construct Successor to FBR Monju by 2030

In the morning of December 26, the Agency for Natural Resources and Energy (ANRE) of the Ministry of Economy, Trade and Industry (METI) held a meeting of its Nuclear Power Subcommittee, which falls under the Electricity Industry Committee of the Advisory Committee for Natural Resources and Energy. At the meeting, ANRE presented future scenarios for the commercialization of the nuclear fuel cycle, which were then discussed by the subcommittee members. ANRE's basic scenario involves the construction by around the year 2030 of an upgraded FBR to succeed the current FBR Monju (280 MW), with a second reprocessing plant (following the Rokkasho Reprocessing Plant) to begin operation around 2045, and the introduction of the FBR on a commercial basis in 2050 or so.

ANRE presented three scenarios: (1) the basic one, (2) an "early commercialization" variation, and (3) a "late commercialization" version.

Under the basic scenario, the FBR Monju's operation will be resumed at the earliest possible date, so as to establish technology for handling sodium. Also, activities identified collectively as "investigating and researching a strategy for commercializing the FBR cycle" will be completed by the year 2015. A timetable for FBR commercialization and an R&D program will then be proposed. Thereafter, the successor reactor and other facilities will be



JAERI's FBR Monju

completed by 2030 or so, after which engineering-scale and commercial-scale experiments will be undertaken on reprocessing and fuel fabrication for the FBR cycle. Around 2050, a commercial FBR is expected to enter service. After that, LWRs in Japan will be gradually phased out and replaced by FBRs.

Around the year 2030, a large number of nuclear power plants (NPPs) is expected to be constructed in Japan owing to the need to replace existing ones, and that situation will largely be covered through the development of next-generation LWRs. Until the introduction of FBRs on a commercial basis, plutonium from reprocessing the LWR fuel will be recycled via the MOX-use program, and spent MOX fuel will be stored for FBRs.



JNFL's Rokkasho Reprocessing Facilities

The alternative scenario of later FBR commercialization is grounded on the assumption that either (1) FBR technological development will be substantially delayed, or (2) uranium will become more readily available. Commercial FBRs would then be introduced by as late as 2090, and the second reprocessing plant would be used

exclusively for LWR fuel.

In the “early commercialization” alternative, in contrast, the supply of uranium worldwide will have tightened, requiring commercial FBRs by around 2040. In that case, a second reprocessing plant would start operation while the Rokkasho Reprocessing Plant (scheduled to operate until 2045) was still in service, and it would reprocess fuel from LWRs, FBRs and the MOX-use program.

Subcommittee members offered several comments on the three scenarios. One said, “As FBR development in Japan has already been delayed, it should be speeded up as a matter of course. In order to make up for the lost decade, substantial human resources and money should be devoted to the project.” Another person opined, “A basic scenario should be clearly presented, and fleshed out with specificity.” Meanwhile, someone else said, “Japan needs to boost its technological preparedness on account of the uncertain future.” One member stated, “Fast reactors, rather than FBRs, should be introduced as soon as possible to cope with the accumulation of plutonium.” Another person felt that “the usage of plutonium in the form of MOX fuel should be limited to a single instance, and then recycled in FBRs.” One member commented, “Scenarios should be accompanied by financial plans.” Lastly, someone said, “The division of roles between the public and private sectors ought to be clarified.”

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