

RIKEN RI BEAM FACTORY PROJECT: PROGRESS REPORT

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Abstract

The progress of the RIKEN RI Beam Factory project is briefly described.

1 OVERVIEW OF THE PROGRESS OF THE RIKEN RIBF PROJECT

The world-top-class radioactive-isotope-beam (RIB) facility, which is called "RI beam factory (RIBF)", is under construction at RIKEN (Fig. 1.) This facility is based on the so-called "in-flight RI beam separation" scheme. In the first phase of the RIBF project, a new high-power heavy-ion accelerator system will be commissioned late in 2006. This system is a cascade of three ring cyclotrons with K=570 MeV (fixed frequency, fRC), 980 MeV (Intermediate stage, IRC) and 2500 MeV (superconducting, SRC), respectively (Fig. 2.) It will boost energies of the output beams from the existing K540-MeV ring cyclotron up to 440 MeV/nucleon for

light ions and 350 MeV/nucleon for very heavy ions (Fig. 3.) These energetic heavy-ion beams are converted into intense RI beams via the projectile fragmentation or in-flight fission of uranium ions by the superconducting isotope separator, BigRIPS. The combination of the SRC and BigRIPS will expand our nuclear world into presently unreachable region (Fig. 4.) The construction of the RIBF building will be finished in May 2005. Major experimental installations to be constructed in the second phase of the project are under priority discussion, and in connection with this, we will hold the international peer review committee meeting in November 2004. Experimental installations under discussion are: a zero-degree forward spectrometer, a large solid-angle spectrometer, a gamma-ray detector array, a very slow RIB facility, a slow polarized RIB facility, an RI-beam high-resolution spectrograph, an electron scattering device and an RI storage ring. Construction of the second phase is expected to start in 2006 (Fig. 5.)

RI Beam Factory (RIBF):
Upgrading project of RIKEN Accelerator Research Facility (RARF)

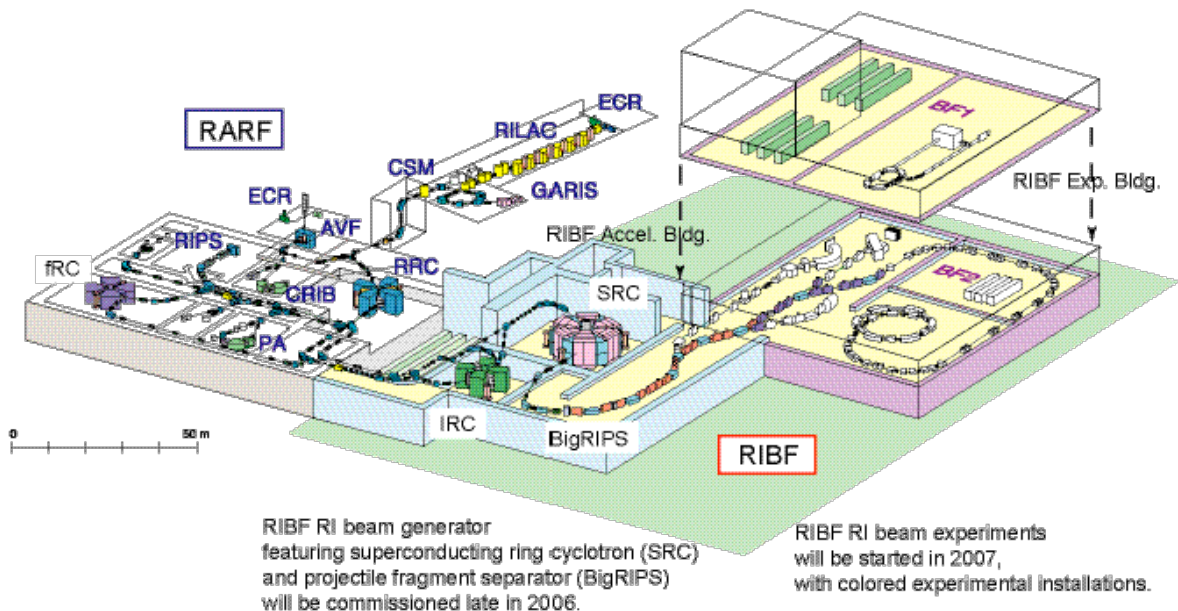


Figure1: Layout of the RIBF and the present RARF.

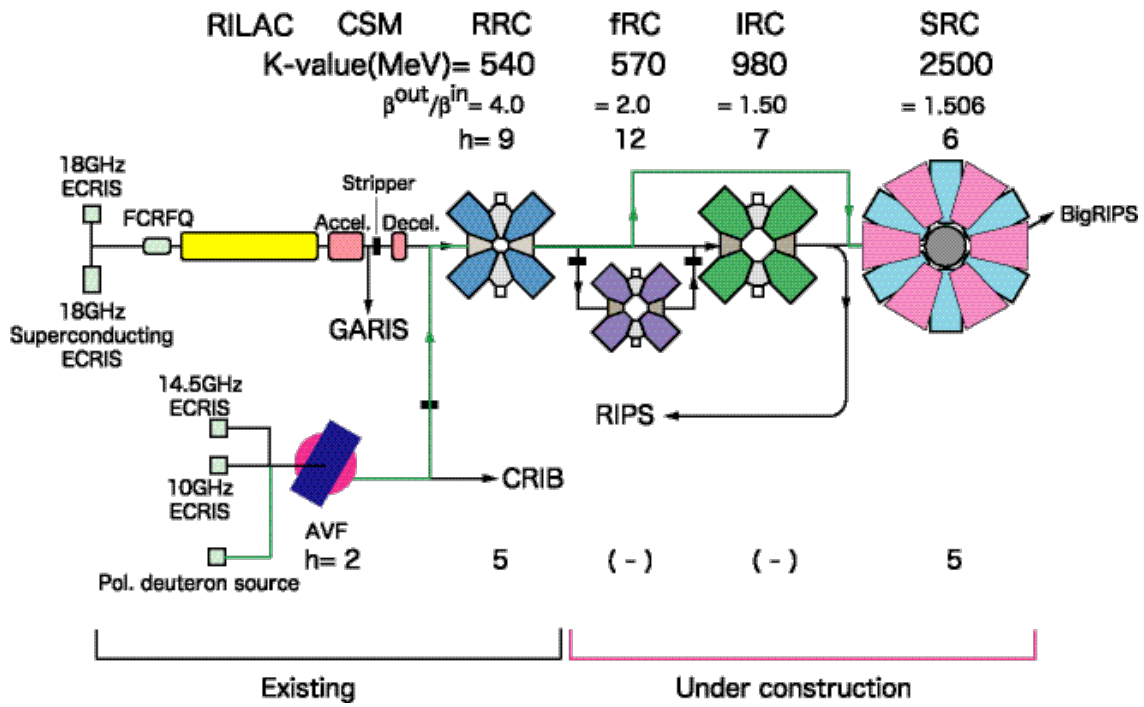


Figure 2. Schematic diagram of the RIBF heavy-ion accelerator system.

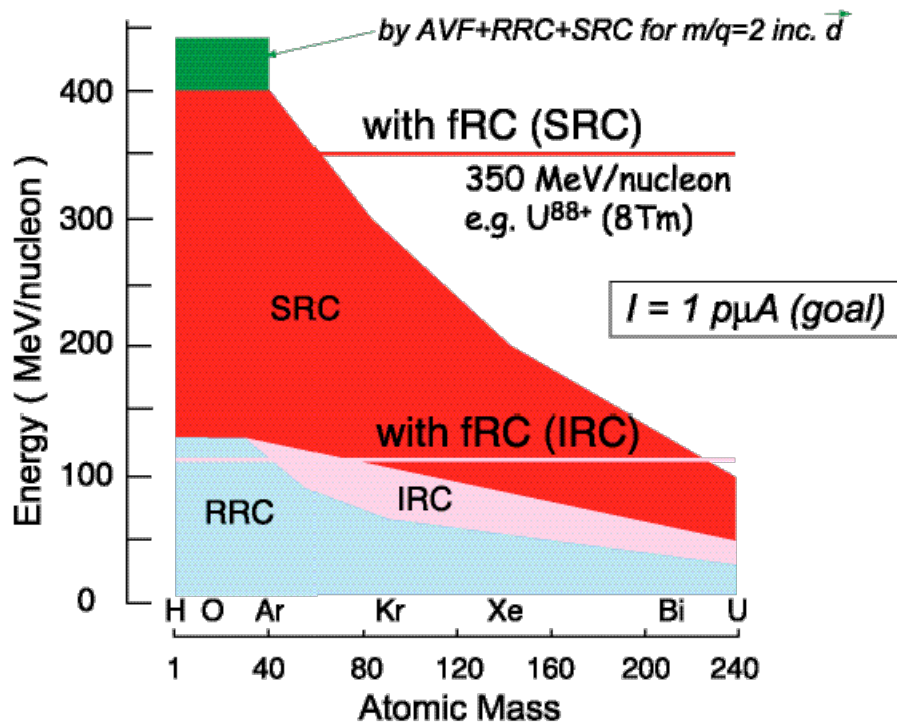


Figure 3. RIBF accelerator performance.

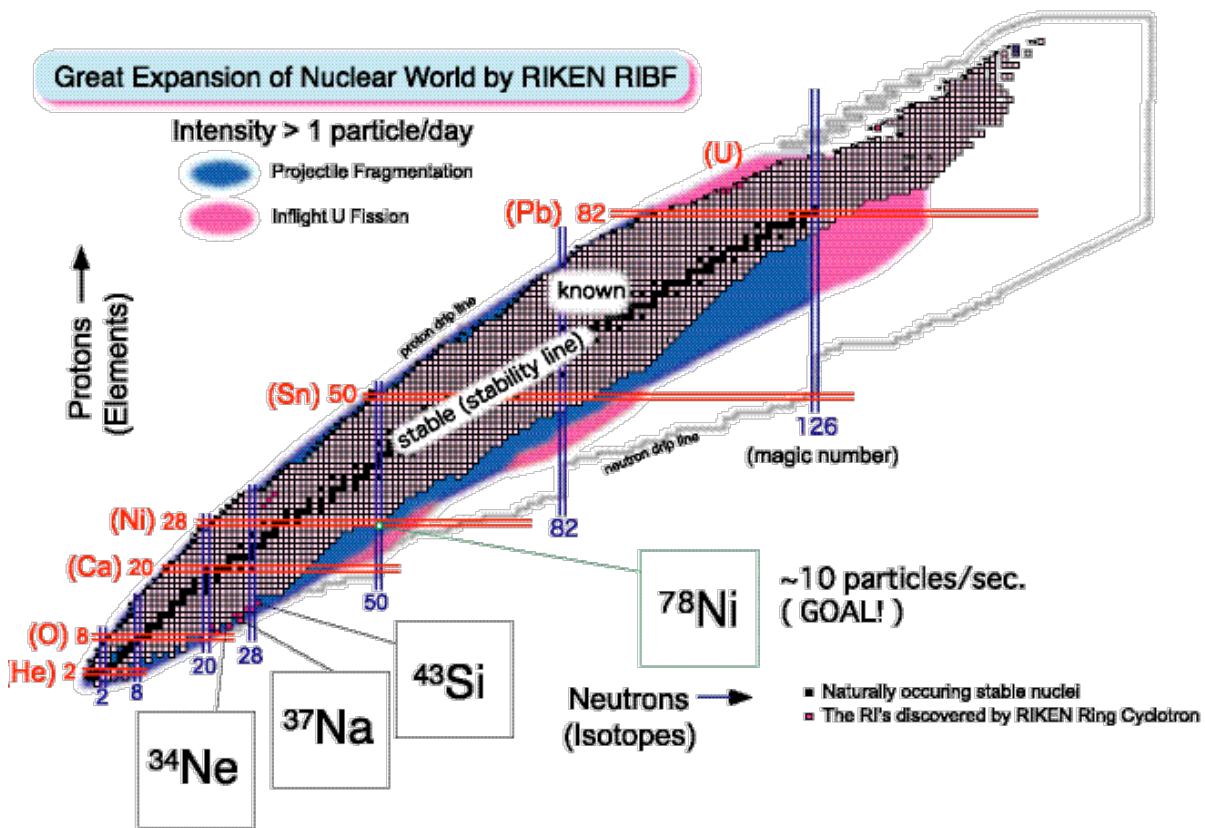


Figure 4. Expansion of the nuclear chart by RIBF.

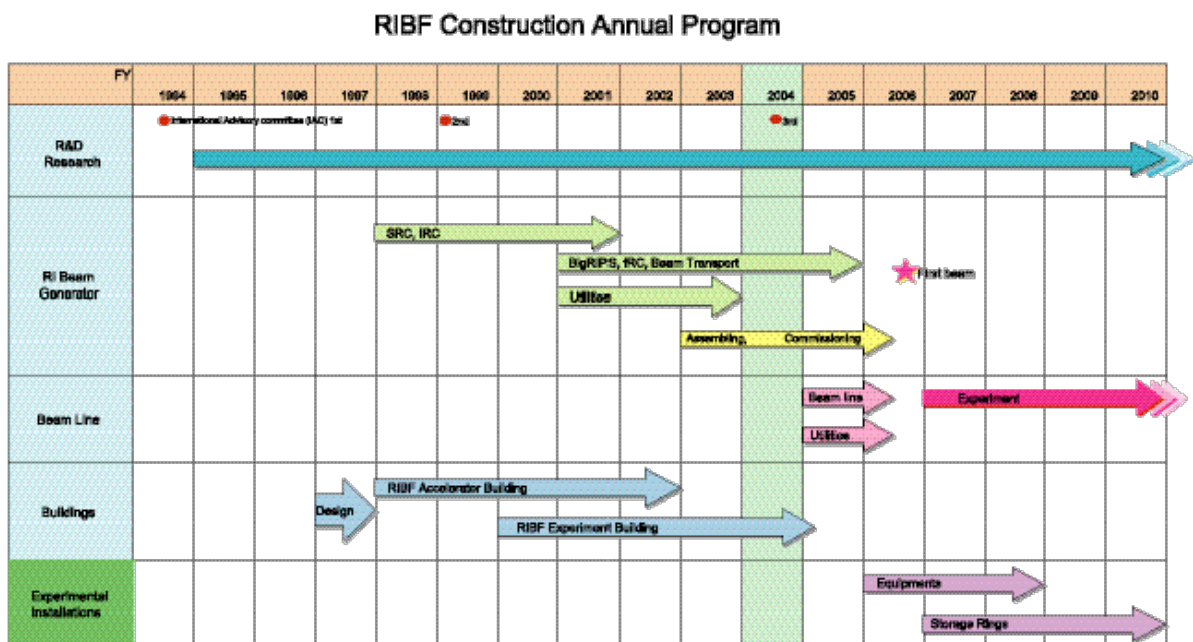


Figure 5. RIBF construction annual program. Experimental installations are under priority discussion. The total cost for them is estimated to be about 5 billion Japanese yen.