

Minutes of the 44th Machine-Time Committee Meeting

Date and time: May 20, 2011; 13:30–14:55

Place: RIBF Bldg., Room 203

Attendees: Sakai^a (Chair), Haba^{a,†}, Hayashi^{a,†}, Henning^{a,†}, Inabe^{a,†}, Kamigaito^a, Kase^a, Kubo^a, Kubono^b,
K. Morita^a, R. Morita^{a,†}, Motobayashi^{a,†}, Sakurai^a, Shimoura^b, Teranishi^{c,†,‡}, Ueno^a, Uesaka^a,
Uwamino^a, Wakasugi^a

Absent: Abe^a, En'yo^{a,†}, Fukunishi^a, Yoshida^{a,†}

^aRNC / ^bCNS / ^cRIBF-UEC / [†]Observer / [‡]TV attendee
(in random order)

Reports

1. Beam-time schedule changes (Ueno)

The director of Accelerator Group reported on May 9 that a serious trouble was found in the AVF cyclotron, and that it would be impossible to have it repaired temporarily in a short period of time. Due to this trouble, all beam times (BTs) which could not be conducted with RILAC in lieu of AVF were canceled. Only the following BTs will be scheduled:

- The machine study MS11-05 (Yamada) for the test of RILAC2 and the new gas charge-stripper system will be scheduled (ongoing as of May 20). With the cancellation of the scheduled BT scheduled using the acceleration mode of AVF+RRC+SRC during which time the test of SRC had been planned, a BT originally designed to use IRC as the final accelerator, had to be changed to use SRC instead by extending the BT for three days (until 9:00, May 21), during which time the performance of SRC will be also checked. Since the electric power usage by the BT may exceed the upper limit stipulated by RIKEN, other experimental devices must be shut down as much as possible as well as the power usage by the offices of the RIBF / Nishina buildings restricted.
- The BTs for a BigRIPS machine study and NP1012-SHARAQ05-01 (Yako) will be scheduled by changing the injector to RILAC, where the performance of the RIBF experimental key devices (BigRIPS, ZDS, and SHARAQ) will be checked.
- Without AVF, it is impossible to provide a ¹²C beam at $E/A = 135$ MeV to the radiation biology BTs as originally requested. Instead, the beam will be delivered at 85 MeV under the scheme of RILAC + RRC even though the Acc. Group has had no experience with this mode.
- Except for the time when RILAC is being used as in the above three BT, the BT of NP0702-LINAC12-12 (Morita) is scheduled to take place until 9:00, July 1.
- The BT for a machine study of the ²³⁸U acceleration with RILAC2, MS11-08 (Imao), is scheduled for late June.

2. Status of RIBF operation

- AVF trouble (Kase)
 - Immediately after the March 11 earthquake, the AVF-related BTs were canceled, but a set of radiation biology BTs resumed without any trouble on April 15. During the BT of the RI

production which started from April 30, however, the RF system became unstable. The Acc. Group decided to stop the beam delivery and cancelled the BT.

- Investigation by the Acc. Group following the above trouble revealed that the accident was due to i) damage of the O-ring sealing the lower side of the AVF main chamber and ii) a water leakage from a damaged water-cooling tube built inside the Dee electrode. In particular, the damage ii) is serious and could not be repaired in a short period of time.
- After the director of Acc. Group reported the result of the analysis, the User Support Office immediately announced the change in BT schedule and notified to those concerned about the AVG trouble on May 10 (See Report 1). (Ueno)
- Installation of a new O-ring will take place for two weeks in July. The Dee electrode will be recovered using the following two approaches:
 - i) A new Dee will be constructed. Although the construction will takes three months, AVF will be restored before the start of BT scheduled for the second half of this fiscal year starting from October 1.
 - ii) The Acc. Group will also try to repair the damaged Dee. If it can be repaired, it will be fully recovered by the end of July at the earliest.
- ¹²⁴Xe Commissioning (Kamigaito)
 - The performance test of RILAC2 and a new gas charge-stripper system is currently conducted as of May 20.
 - The Acc. Group confirmed that the performance of the beam-transport system and accelerators up to IRC are fine. Also, the Group has yielded good results in the test of the 28-GHz new ECR ion source, RILAC2-combined cascade acceleration, and a gas charge-stripper system. In the next step, the Group will conduct the acceleration test up to SRC, as indicated in the above Report 1.

3. Status of the PAC meetings (Ueno)

9th NP-PAC

- The call-for-proposals was closed on May 15 as scheduled. In total, 13 proposals have been submitted. The breakdown of the proposals are as follows: RIPS(1), RIBF new facility (11 = 7 [BigRIPS/ZDS] + 1 [SHARQ] + 3 [SAMURAI]), and construction (1).
- In-house technical reviews will be conducted from May 17 to 25. The report of the review will be sent to the PAC and the applicants.
- Follow-up evaluations of completed BTs will be conducted from May 18 to Jun 6. The report of the evaluation will be sent to the PAC.

Topics discussed

1. Approval of the minutes of the previous meeting (Sakai)

2. RIBF accelerator operation plan in the aftermath of the massive earthquake of March 11 (Sakai)

- The current electric power of the Wako campus is being managed by the Committee for power

Saving Measures at Wako Campus (CPSMWC) established under the RIKEN Emergency Headquarters. In accordance with the decision made by CPSMWC, The MT Committee laid out the following plans: i) in April, only BTs whose power can be supplied by the CGS system will be performed, ii) in May, performance tests of the overall accelerator facility under optimized combinations of cyclotrons to achieve the minimum power consumption, using an additional 5 MW (maximum) supplied by Tokyo Electric Power Company (TEPCO) will be conducted, and iii) the accelerators will be shut down for three months from the beginning of July to the end of September.

- However, plan ii) had to be changed due to the AVF trouble, as indicated in the above Report 1.
- As for the second half-year, it was determined by the CPSMWC to restrict the external power use by Nishina Center to a maximum of 10.5 MW from Oct. to Nov., 8.5 MW from Dec. 1 to 11, and 5 MW from Dec. 12 to Mar. 31. By comparing a long-term RIBF operation plan with the above decision by CPSMWC, BT scheduling of ^{238}U from Oct. to Nov. and ^{124}Xe in the early Dec. is currently under consideration. For other periods of time, BT scheduled at the new facility of RIBF which requires lower power beam such as $A/q \sim 2$ and/or at the former RARF facility are being considered. The outline of the second half-year BT schedule will be discussed furthermore.

3. Energy dependence of RIB production yields from a ^{48}Ca beam (Inabe)

- The yield of an RI beam ^A_ZX produced with BigRIPS under the condition of full acceptance was studied and reported from the BigRIPS Team at the incident energies $E/A = 200, 250,$ and 345 MeV, where Z and A meet the conditions $8 \leq Z \leq 14$ and $A = 3Z + \alpha$ ($\alpha = \pm 2, 0$). This has been requested by the User Liaison and Industrial Cooperation Group in case when power shortage situation will continue for a longer period of time than anticipated.
- It was reported based on LISE++ calculations, the production yields are reduced to 62 % and 44 % at $E/A = 250$ and 200 MeV, respectively, compared with those at 345 MeV. The theoretical yields can be approximately expressed by $(E/A)^{1.5}$ dependence.

4. Announcements of the beam-time change caused by serious trouble (Ueno)

- The aforementioned AVF trouble and the consequent change in BT schedule were notified to the representatives and RNC / CNS people affected by them.
- A request was made to have such information announced to all RIBF users as well in case of serious trouble (Teranishi).

5. Beam-times of JAEA (K. Morita)

- The feasibility of RIBF accepting JAEA experiments for RILAC BTs to support those facilities damaged by the disaster-affected institutes, if requested, was discussed.
- Following the discussions, it was approved to accept JAEA BTs with the approval of the NP-PAC chair.

6. Next meeting

- The next MT Committee meeting will be held on Friday, June 10, 2011, at 10:00.
- The meeting after the next will be held on July 15, 2011, at 13:30.