

## NISHINA RIBF water-cooling system 2014

T. Maie,<sup>\*1</sup> K. Kusaka,<sup>\*1</sup> M. Ohtake,<sup>\*1</sup> Y. Watanabe,<sup>\*1</sup> E. Ikezawa,<sup>\*1</sup> M. Kase,<sup>\*1</sup>  
M. Oshima,<sup>\*2</sup> H. Shiraki,<sup>\*2</sup> K. Kobayashi,<sup>\*3</sup> and J. Shibata<sup>\*3</sup>

### 1. Operation condition

In the fiscal year 2014, the Nishina and RIBF water-cooling installation was operated for one hundred and fifty days and five months, respectively. These operation periods correspond to the scheduled beam service time of RIBF, which is five months. In addition, Nishina's cooling installation was used not only for the full RIBF operation but also for the AVF standalone operation, RILAC + RRC operations, RILAC2+ RRC operations, and AVF + RRC operations. During FY2014, there were no severe problems that caused beam service interruption for the Nishina and RIBF cooling water system. However, mind problems were often encountered, these are reported here.

### 2. Trouble report

Water leakage in the cooling system was a problem, particularly water leakage from a connection part of the flange portion and coupler in the cooling laying of the pipes. Another problem is the deterioration due to aging of the slack and the flange packing of the bolt by the vibration of the coolant pump, electrolytic corrosion, corrosion of the cooling plumbing is important. However, with the cooling facilities at the Nishina center, a water leakage sensor is attached to the outside of the accelerator and a beam line, the point of the cooling plumbing and, regardless of the whole stop, a member of driving of the accelerator discovers it easily while driving and comes to be able to cope. Other problems, include issues with the inverter, pressure gauge, and flowmeter, as well as problems with the packing of the coolant pump and damage of the mechanical seal; control is the main problem that occurred in 2014. In some cases, damage to the motor of the cooling tower fan occurred at snowy weight by the snow. Other factors affecting cooling facilities other than the above-mentioned problems include a affected by cooling facilities than a stop of steam and the cold water supplied from rolling blackouts and the cogeneration in the place. SRC and the Big RIPS He-refrigerator do not become if they do not always cool off, and it is necessary for pro-backup, to change the power supply and coolant beforehand to prevent one from being affected by a blackout and suspension of the water supply, which 2-3 times occurs in a year.

### 3. New establishment, improvement

Even during periodical maintenance, etc. when the accelerator is stopped, the RIBF cooling facilities have various new establishments and show, improved construction. It is built the cooling facilities for return beam lines as a representative thing by new construction sequentially from the year before last; As an example of the improved construction, I improved the cooling plumbing for the ability for cooling reinforcement pro-IRC and SRC exc. cooling and cooling reinforcement of SRC-MDC1 sequentially from last year.

### 4. Summary

I intend to minimize the problems associated with cooling facilities in future, while aiming for stable cooling facilities without problems, and suggesting the enforcement of effective maintenance, and undertaking premeditated deterioration measures.

### References

- 1) T. Maie et al.: RIKEN APR .47
- 2) Y. Watanabe et al.: RIKEN APR .48

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\*1 RIKEN Nishina Center

\*2 Nippon Kucho Service Co., Ltd

\*3 SHI Accelerator Service Co., Ltd