

## Nishina RIBF water-cooling system operational report 2019

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### Operation condition

In 2019, the cooling systems of Nishina and RIBF were operated for a slightly longer period than the accelerators. Excluding some installation that was run continuously, RIBF's cooling systems were operated for approximately four months. Furthermore, Nishina's cooling systems AVF-standalone, AVF+RRC, AVF+RRC+IRC, and RI-LAC II+RRC+GARIS-II were operated for approximately eight months.

No huge troubles that could cause the long-term interruption of accelerator operation occurred, and the cooling systems operated stably with the exception of some minor problems.

### Trouble report

Many issues occurred because of the cooling systems, and all of the inverters were unexpectedly renewed owing to these issues. There was a malfunction of the bearing of the cooling water pump motor, an issue with the control valve of cooling water for stable supply, and a failure of the inverter for the cooling-water pump due to aging.

### Periodic maintenance

- (1) Cleaning of the cooling towers
- (2) Inspection and overhauling of the cooling-water pumps
- (3) Inspection of the inverter for the RIBF cooling-water pumps
- (4) Replacement of some superannuated hoses, joints and valves used in the system
- (5) Cleaning of the strainers and filters used in the deionized water production system
- (6) Extension of the sensing wires of the water-leakage alarm to floors of new areas
- (7) Flushing work of the cooling-water pipe that was blocked by dirt

### New installations and improvements

The cooling systems for the superconducting RI-LAC, which had been constructed in the previous year, started operation for commissioning. In addition, new cooling systems, which were built for increasing the



Photograph of the RRC Cooling capacity augment equipment

cooling capacity of RRC and for stabilizing the cooling-water temperature of RRC was safely completed in March 2019. While the implementation of new systems has not started yet, reasonable data could be obtained during the trial operation. It is expected that a progress report concerning implementation will be available in the next year.

### References

- 1) T. Maie *et al.*, RIKEN Accel. Prog. Rep. **51** (2017).
- 2) T. Maie *et al.*, RIKEN Accel. Prog. Rep. **52** (2018).

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