

On reducing water-related troubles at HIMAC

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Introduction

Though the cooling-water system had been checked periodically (Every biweekly and half a year), the beam stop was caused in many cases. (The left Half of the right figure)

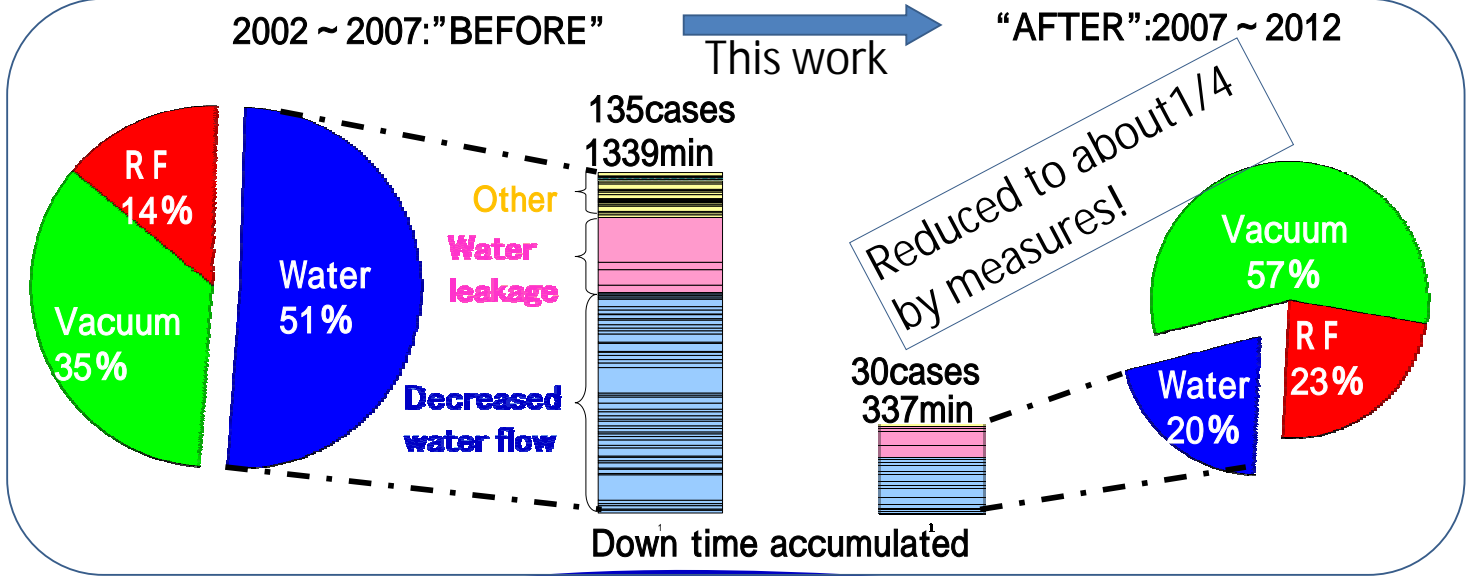
The following two measures were introduced in order to reduce water-related troubles.

(The result is the right half of the right figure.)

1) We found that a decreased water-flow occurs more at small magnets. Thus we introduced the system using a new flow instrument so that those flows are continuously monitored at the control room.

2) Though water leakage occurs less frequently, it took a long time to locate and fix the leak. Therefore water sensing tape devices have been installed around major area of the accelerator and similarly monitored in the control room.

Water-related troubles



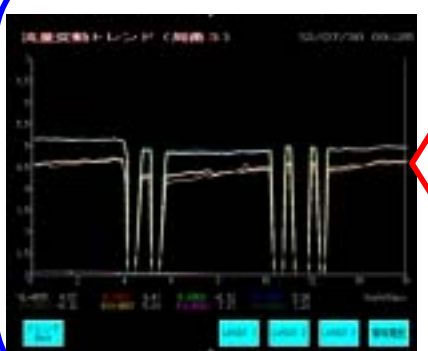
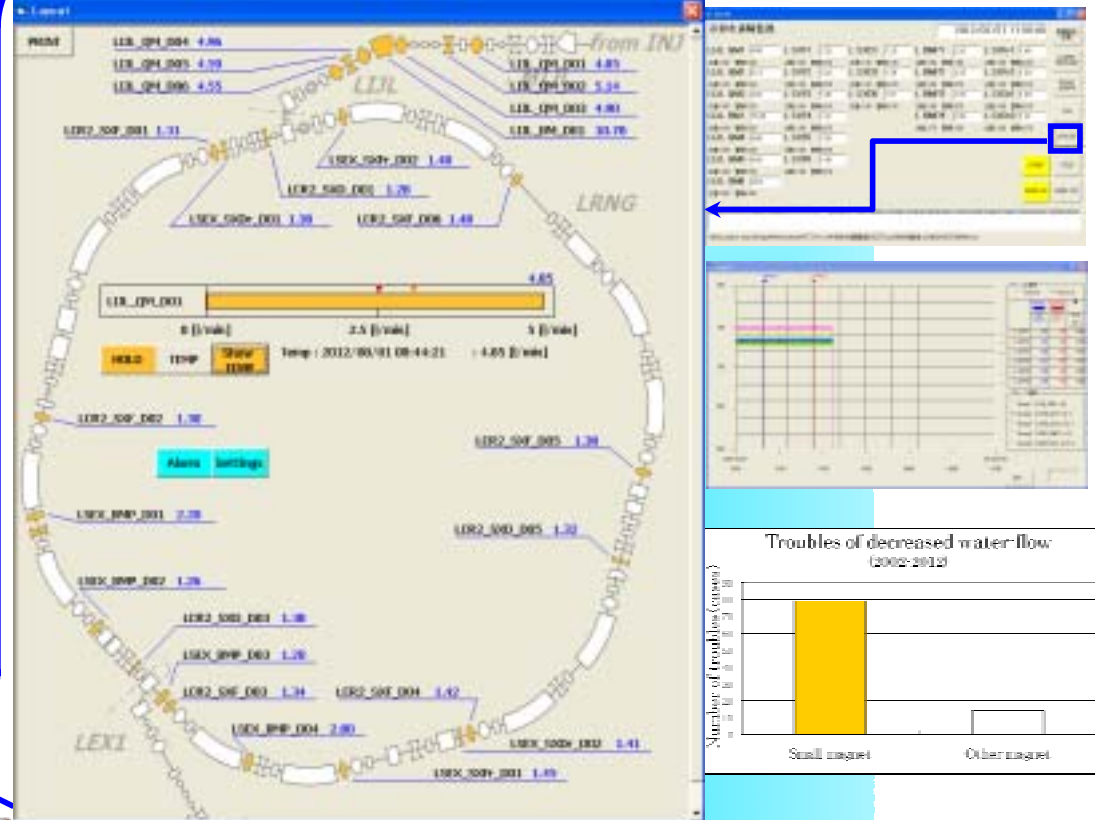
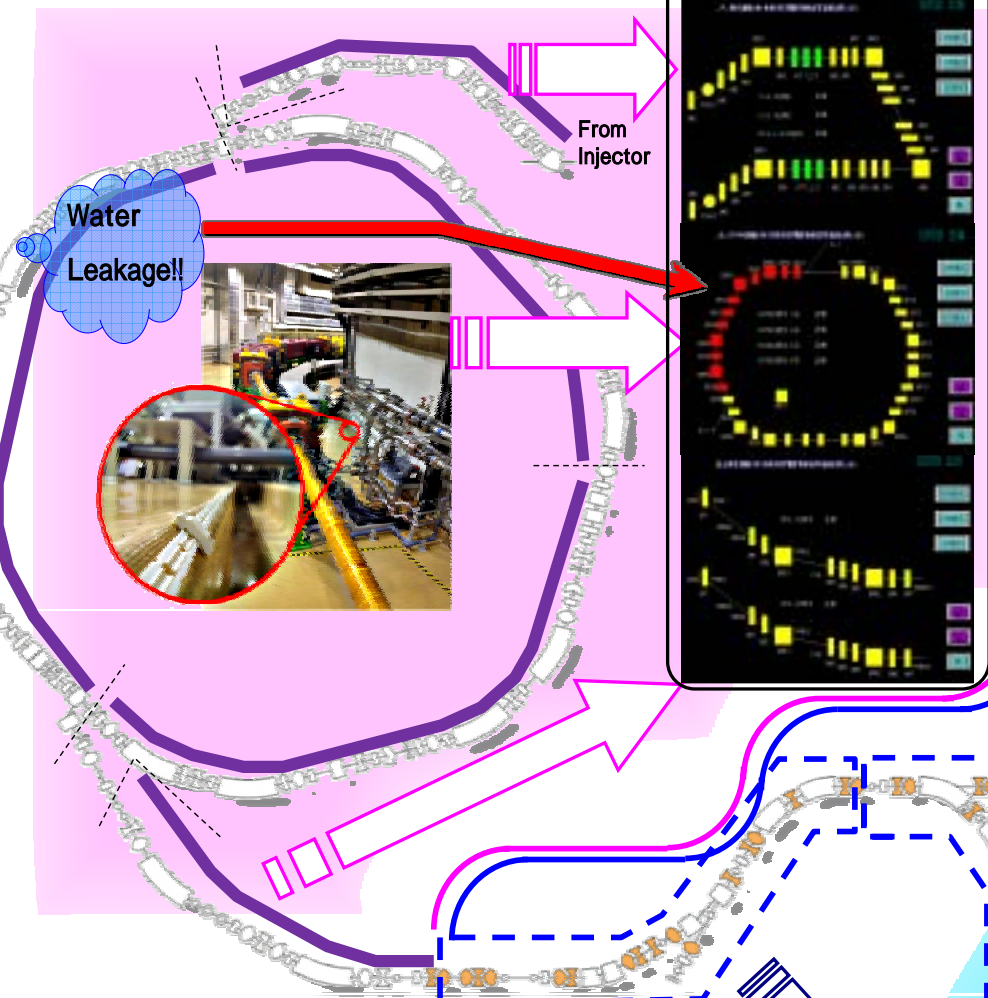
Water leakage detection system

Location of leakage sensor

Control room display

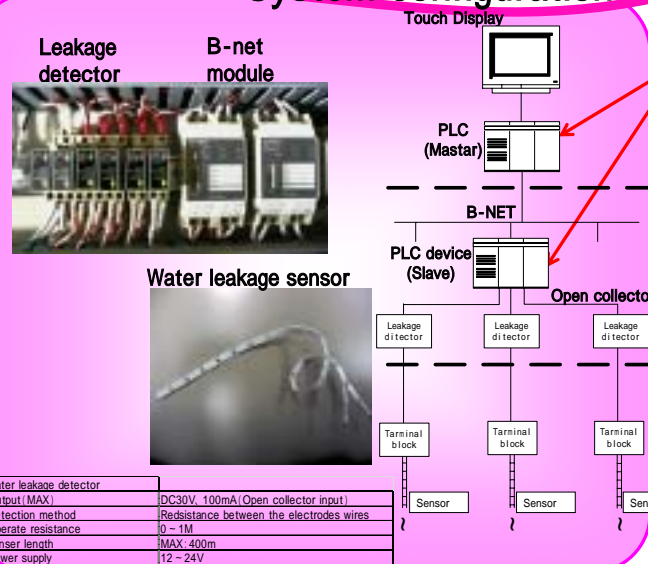
Remote monitoring system of water-flow

Control room display



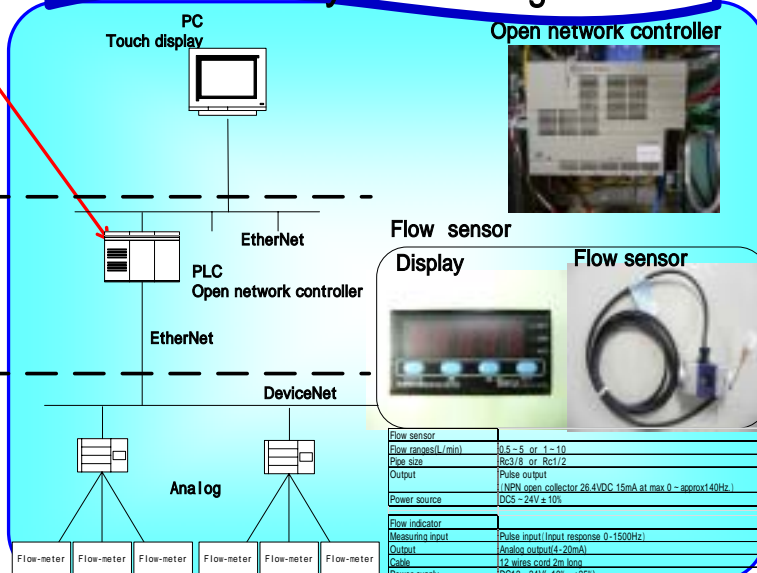
Leakage detector

System configuration



Remote monitoring

System configuration



Result and future

- New monitoring systems for cooling water flow to magnets and water leakage have reduced beam down time to about 1/4 of the previous years.

- Continuous remote monitoring is effective in reducing numbers and duration of down-time events.

- Leakage detection should be increased and optimized for quicker and wider coverage against possible leak.