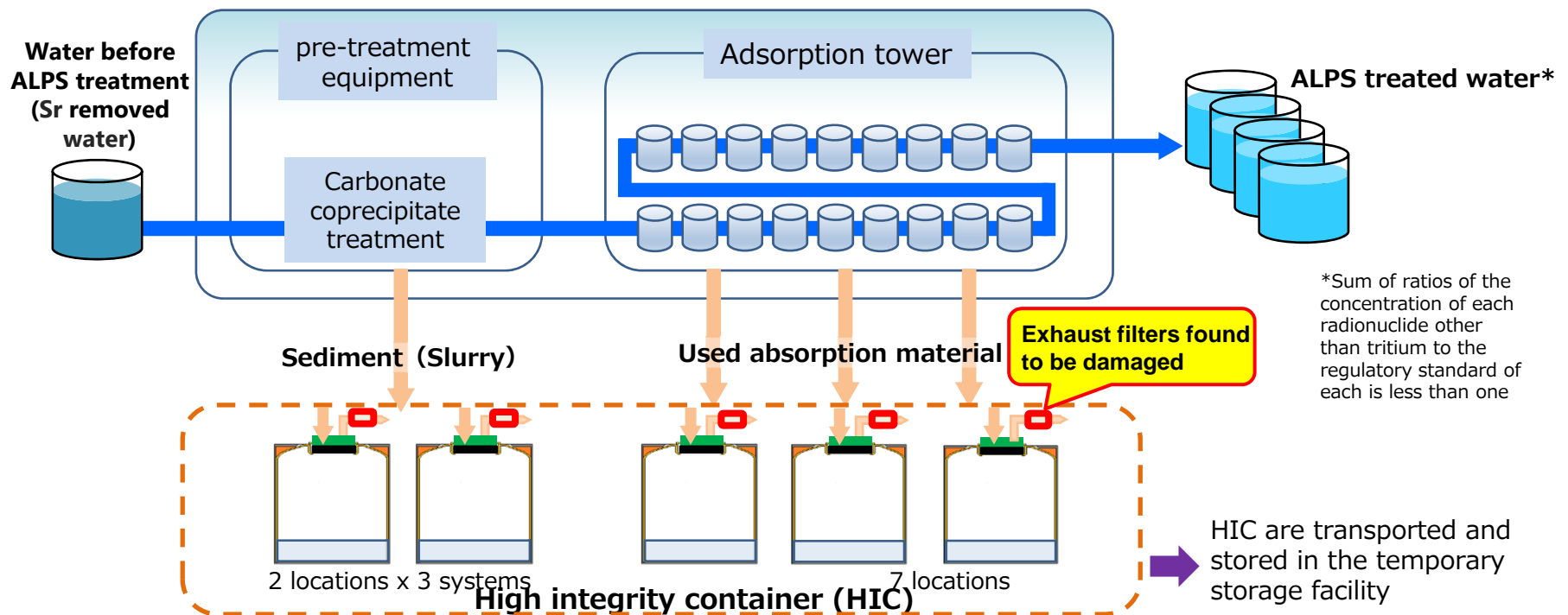


Multi-nuclide removal equipment (ALPS) and high integrity container (HIC) exhaust filters

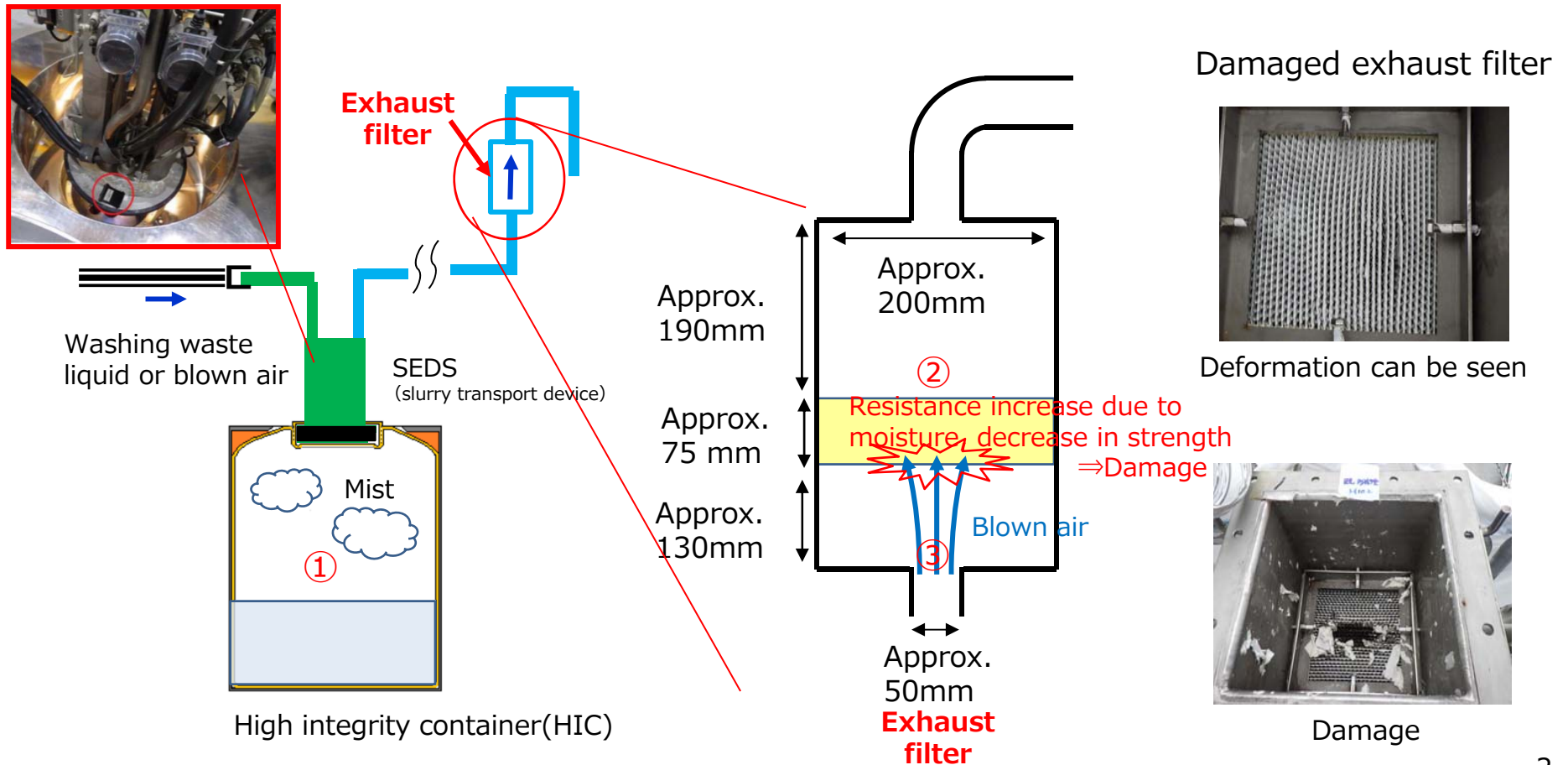
- The multi-nuclide removal equipment (ALPS) exhaust filters that were found to be damaged remove dust from exhaust when pressure inside the HIC is released in the course of transporting slurry (containing radioactive materials) generated during the water purification process, and used adsorbent materials, to the high integrity containers (HIC).
- These exhaust filters are separate from pre-treatment equipment used for purification and adsorption towers, and, to date, damage to these exhaust filters has had no impact on ALPS purification performance, nor treated water.
- Damage was found in a total of 25 locations when the aforementioned exhaust filters were replaced due to condensation at exhaust outlets (July through October 2019), and at the time no steps were taken to ascertain the cause of the damage.
- A detailed investigation will be conducted and permanent countermeasures put in place based on the results

Multi-Nuclide Removal Equipment Configuration (concept drawing off additionally installed ALPS)



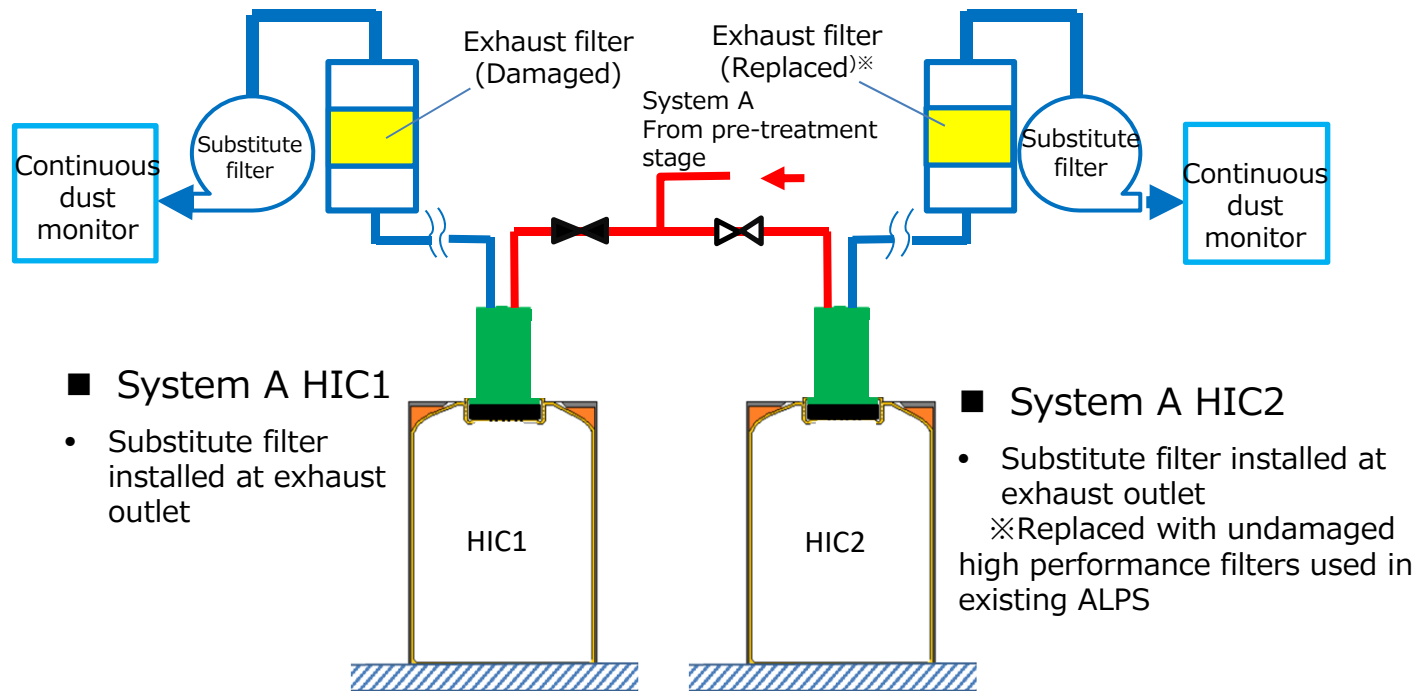
Assumed cause of exhaust filter damage

- The following is the hypothesized cause of exhaust filter damage
 - ① Mist was generated inside the HIC by washing waste liquid during the pre-treatment phase of ALPS operation or when air was blown into the system to expel adsorbents.
 - ② The exhaust filters were moistened by the mist that reached them due to the blown air thereby increasing air resistance. It is hypothesized that filter strength had also deteriorated.
 - ③ The blown air concentrated at the center of the exhaust filters caused damage.



Recommendation of ALPS operation

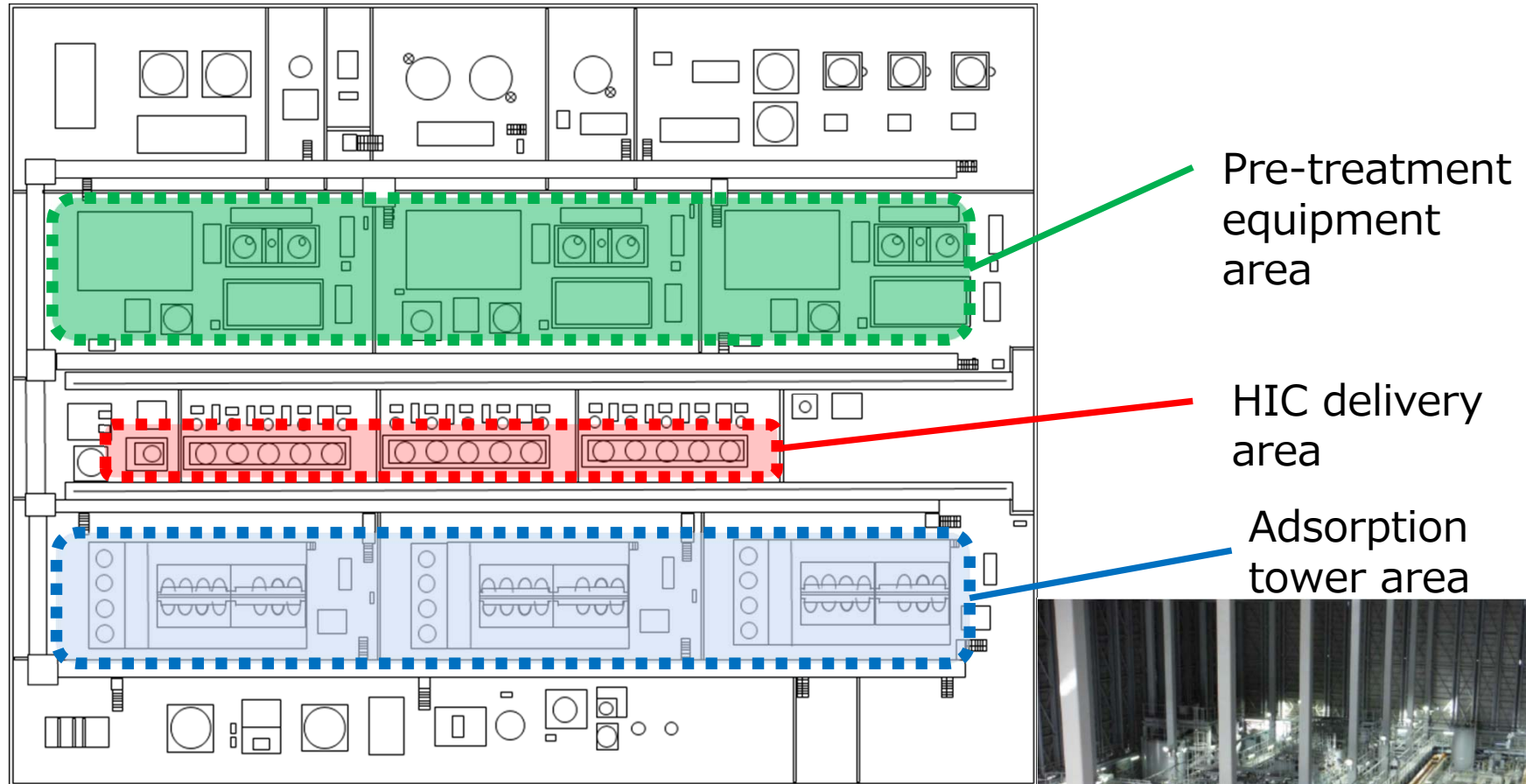
- In light of the assumed cause of exhaust filter damage, the following temporary countermeasures have been put in place and operation of additionally installed ALPS system A was recommenced on September 7. (In preparation to replace adsorbent materials in additionally installed ALPS system A from September 16, we installed substitute filters on additionally installed ALPS system B exhaust line, and switched over operation to additionally installed ALPS system B.)
 - Substitute filters were installed downstream of the exhaust filters to mitigate the impact of mist and blown air
 - A continuous dust monitor was installed to be able to immediately detect damage to the substitute filters
- Since a long-term shutdown of ALPS would increase risks related to treated water in general, we shall carefully operate the equipment while monitoring the effectiveness of temporary countermeasures.
- Along with ascertaining the cause of the damage we shall deliberate permanent countermeasures for mist and blown air upon examining the effectiveness of temporary countermeasures, and reflect the results in the designs



Temporary countermeasures implemented at additionally installed ALPS System A

(Reference) Overview of additionally installed ALPS building **TEPCO**

- Outer dimensions of additionally installed multi-nuclide removal equipment: Approx. 80m×Approx. 60m Height: Approx. 17m



Pre-treatment equipment area

HIC delivery area

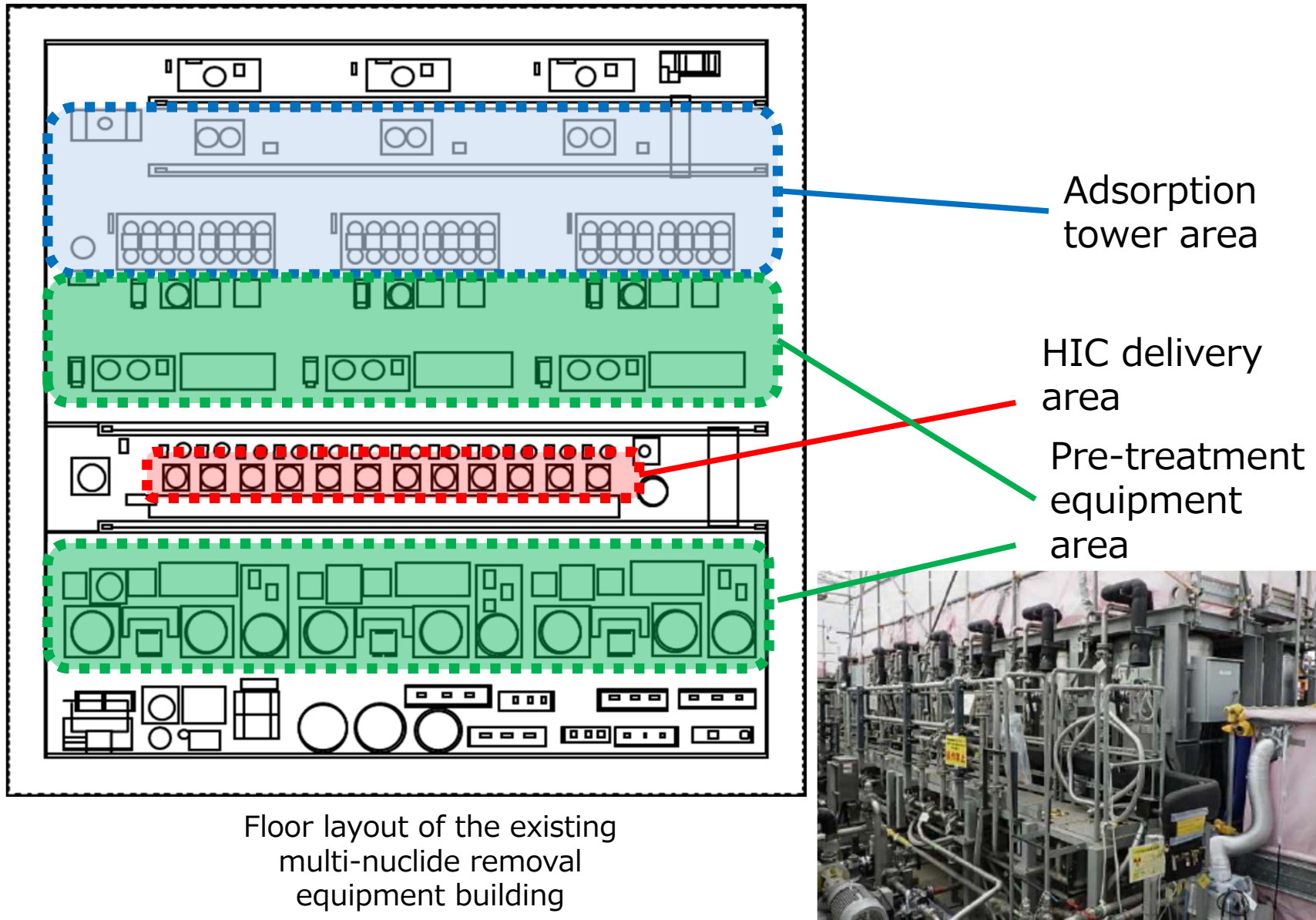
Adsorption tower area

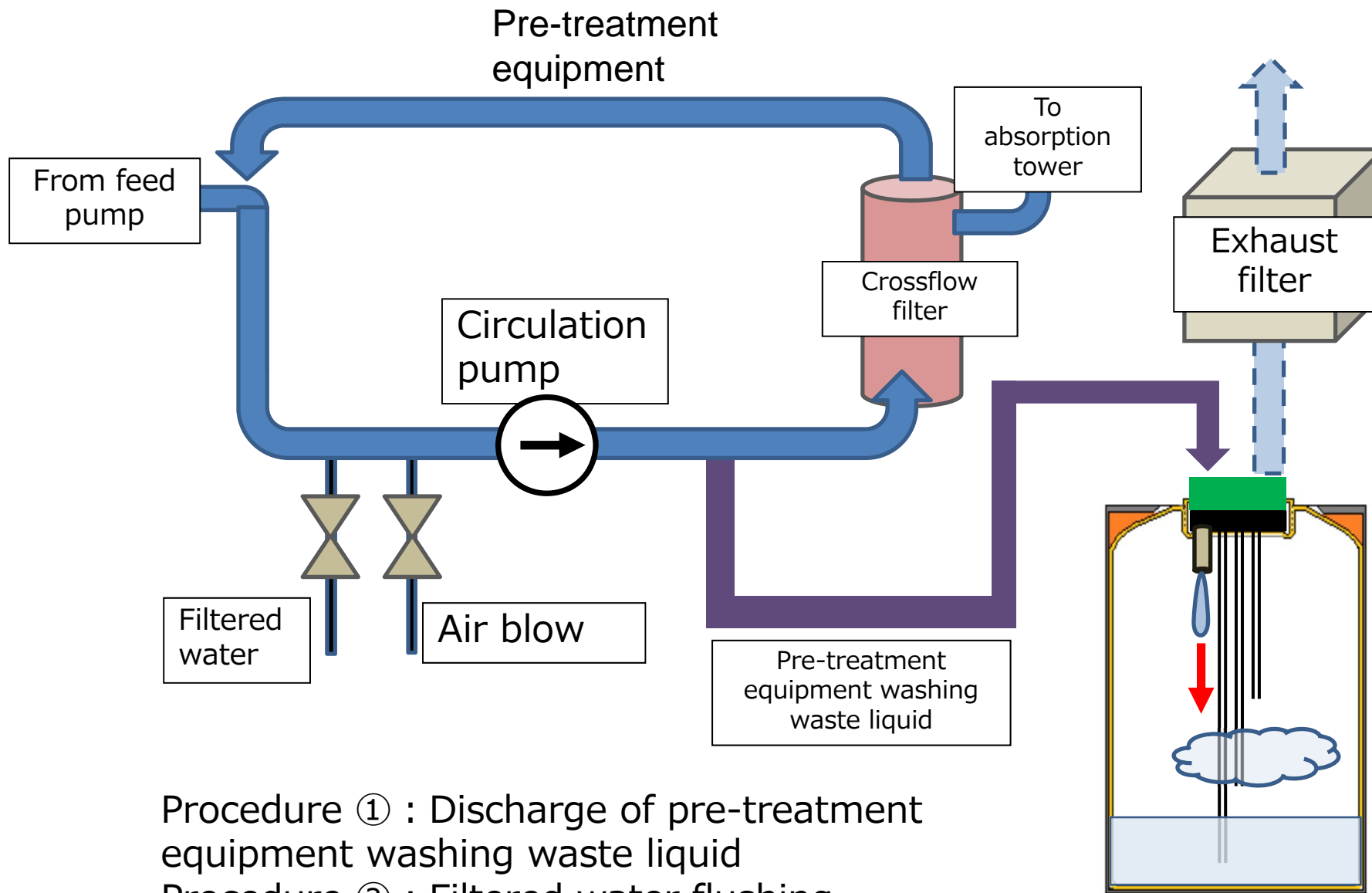
Floor layout of the additionally installed multi-nuclide removal equipment building



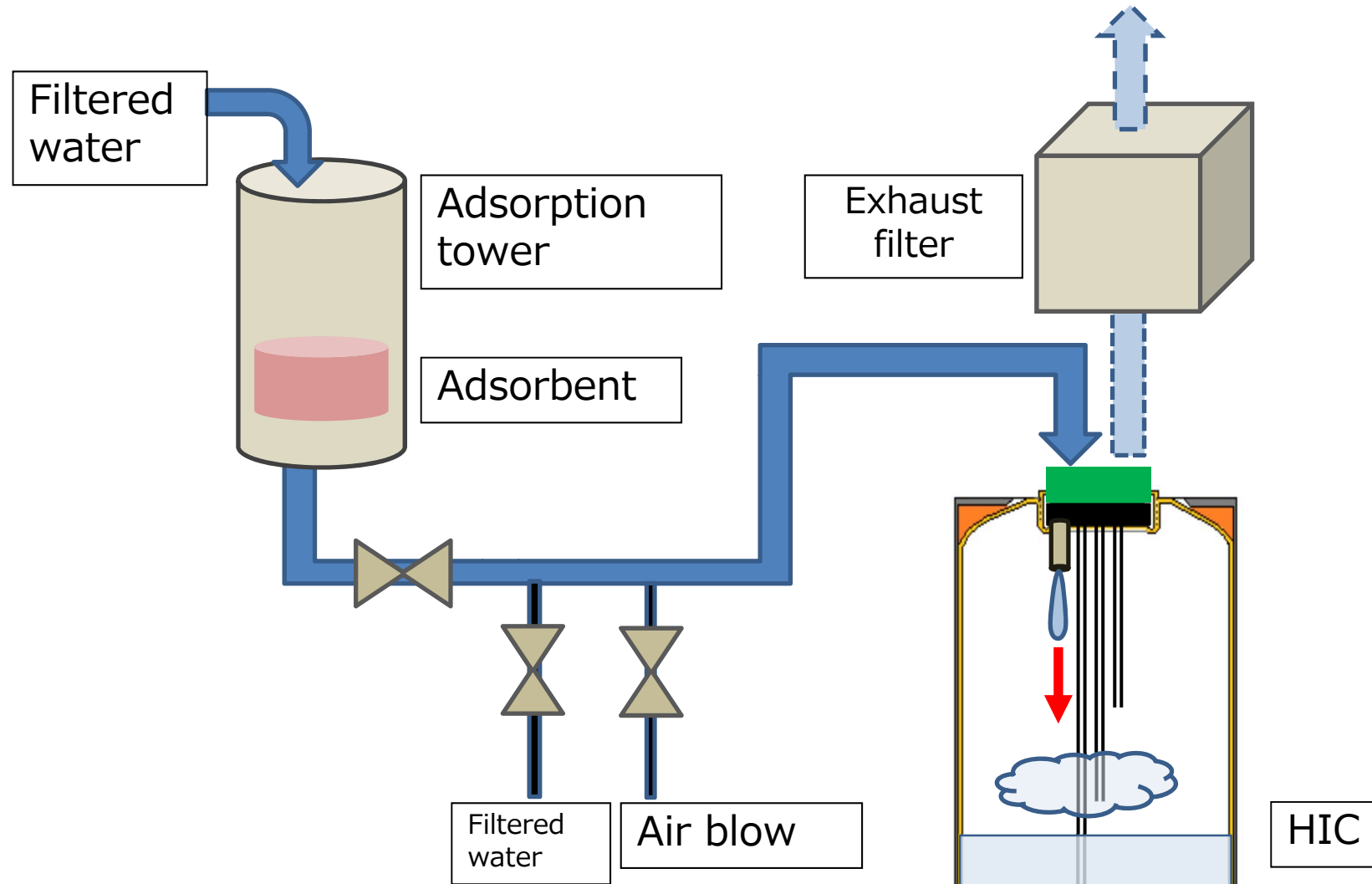
(Reference) Overview of existing ALPS building

- Outer dimensions of existing multi-nuclide removal equipment:
Approx. 60m×Approx. 60m Height: Approx. 19m





- Procedure ① : Discharge of pre-treatment equipment washing waste liquid
- Procedure ② : Filtered water flushing
- Procedure ③ : Air blow



- Procedure ① : Discharge of used adsorbent material
- Procedure ② : Filtered water flushing
- Procedure ③ : Air blow