Summary and Conclusions: Common design issues for plasma exhaust and Divertor have been investigated in JA and EU.

- Requirements of plasma exhaust and divertor designs in JA and EU:
  - Channel (steady-state) ITER level: $f_{\text{exh}} > 500$ (high HI) and larger $P_{\text{exh}}/P_{\text{cool}} > 30-34$ (MWe) and EU (pulse): $f_{\text{exh}} > 200$ (ITER level HH) for ITER level $P_{\text{exh}}/P_{\text{cool}}$, to contribute to optimize future reactor design.
  - Same leg length (1.6 m: longer than ITER)

Power exhaust simulations of $P_{\text{exh}}$: JA: 250-300 MW, EU: 150-200 MW with Ar seeding have been performed, by using JA: SONIC and EU: SOLPS8.1, with similar $q$ profile widths ($q_{95} = 3.0$). For a long operation under DEMO level irradiation, mechanical property of CuCrZr heat sink and Cu-interlayer is anticipated to be an external factor.

- Design concepts for divertor: 1) Power exhaust and Divertor are common critical issues. Joint studies on Plasma exhaust and Divertor design are extended to BA DDA Phase II (2024).

- Design concepts of divertor and Water cooling of DEMO divertor: Optimization of two water routes is required. Coolant temperature is a design issue.

- Divertor heat load can be reduced and water cooling rate is beneficial for ITER level $P_{\text{exh}}$. The power handling $P_{\text{fus}}$ is transferred from heat sink to water.

- Heat load profile (plasmas, external components etc.) is degraded to ITER HH level target peak heat load to flat top (9.1 MW) corresponds to 15.3 MW to the wet area. EU: TITAN, LAHITAN is critical, but high temperature limit (TITAN) under DDA level $	au = 10^7$ to 10$^8$. EU: SOLPS8.1 for ITER, TITAN, LAHITAN for fast pedestal edge temperature and large core temperature plateau.

- Development of water-cooled target components for EU DEMO: Mechanical property of heat sink and joint/interlayer is a key for Cu-alloy application.

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