Large in-vessel and ex-vessel loss-of-coolant accidents of a water-cooled tokamak DEMO have been analyzed.

**Ex-VV LOCA analysis**

- **We have identified** the event sequences following an ex-VV large (double-ended) pipe break of the primary cooling system.
- **The load onto the confinement area** covering the broken primary cooling loop was found to be so large that it is difficult to make a large volume, such as the tokamak building, pressure-tight.
- **The analysis result suggests that measures to protect the confinement area will be needed.**
  - A possible way is to implement a small vault of pressure-tightness or with a pressure suppression system, covering the primary cooling pipes.
Large in-vessel and ex-vessel loss-of-coolant accidents of a water-cooled tokamak DEMO have been analyzed.

**In-VV LOCA analysis**

- We have identified the event sequences following an in-VV multiple break of all the outboard first wall cooling pipes.
- The load onto the VV was found to be several times larger than the VV design pressure.
- The analysis result suggests that measures to reduce the total FW break area will be needed.
  - A possible way is to arrange the pipes along with the toroidal direction rather than the poloidal direction.