Removing the melted fuel is considered the most difficult part of the massive clean-up operation in the wake of the worst nuclear disaster since Chernobyl.

It is not expected to begin until 2021, and TEPCO has other issues to resolve including how to dispose of large quantities of contaminated water stored in containers at the plant site.

A robot will attempt to examine radioactive fuel at Japan's Fukushima nuclear plant on Wednesday in a complex operation seen as key to clean-up efforts after the 2011 meltdown.

The operation is intended to better assess the status of the melted fuel, including whether it is stable enough to be picked up for removal, or may crumble upon contact.

"The operation began at 7:00am local time and will last around five hours. So far no problems have been reported," a spokeswoman for the plant's operator TEPCO told AFP.

The operation is being carried out at the plant's reactor 2, one of three that melted down after a massive earthquake and tsunami in March 2011.

Robots have already peered inside the reactor to allow experts to assess the melted fuel visually, but Wednesday's test will be the first attempt to work out how fragile the highly radioactive material is.