Nuclear Energy

1 Chemical Decontamination during Decommissioning of Nuclear Power Plants

An increasing number of nuclear power plants have reached the stage of decommissioning over recent years. Because worker exposure to radioactive material that has built up on piping and other equipment is a concern during decommissioning, planning for the initial stages of this work includes decontamination to remove this material.

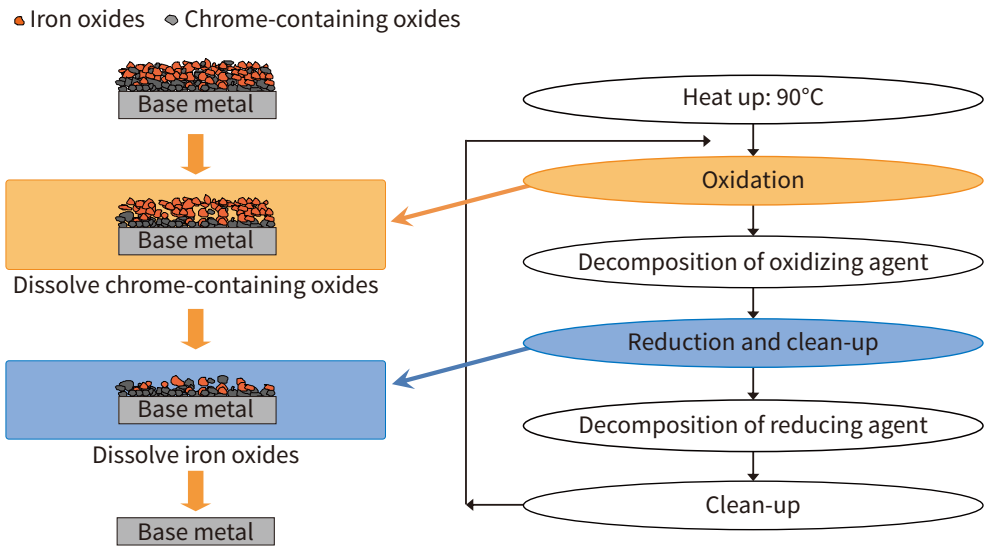
Hitachi developed a decontamination technique that uses hydrazine, oxalic acid, and potassium permanganate (HOP) in 1999. The technique has already been used more than 90 times both in Japan and overseas to reduce worker exposure in operating plants by decontaminating equipment such as external reactor piping that connects to the reactor and is subject to high levels of radiation.

Hitachi has been awarded a contract for chemical decontamination of the inside of the reactor pressure vessel and the reactor internals at Hamaoka Nuclear Power Station Unit 1 of Chubu Electric Power Company, which is currently being decommissioned. Before commencing, fluid dynamics simulation, mockup trials, and other measures were first used to verify that the technique would be able to decontaminate all of the complex reactor internals, in place and simultaneously, while also doing the work without being able to use the existing reactor recirculation pumps, technical challenges not previously faced in Japan. The work was successfully completed, achieving the target level of decontamination.

Hitachi intends to continue to develop this technology in response to customer needs and to deploy it in Japan and overseas.

2 Joint International Development of Small Reactor with Superior Economics

What is needed to make the safe and clean generation of nuclear power more competitive in the market is to achieve generation costs that are lower than other alternatives together with reducing capital

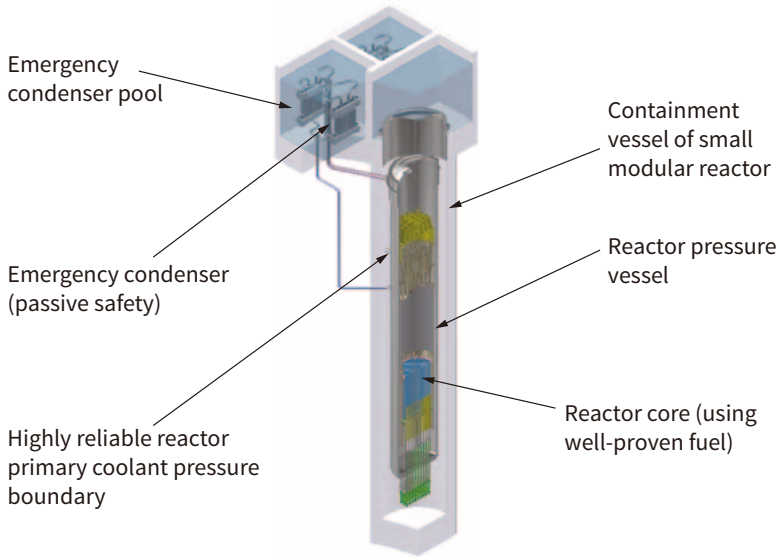


1 Overview of how HOP decontamination is performed

cost and capital risk. To achieve this, Hitachi-GE Nuclear Energy, Ltd. is working with its US partner, GE Hitachi Nuclear Energy, on the development of the BWRX-300 small modular reactor with superior economics that takes advantage of features from the boiling water reactor (BWR). To improve economic performance, the development aims to overcome the disadvantages of scale that come with a small reactor while keeping construction costs much lower than for a large reactor.

To improve the reliability of the reactor primary coolant pressure boundary, the BWRX-300 mitigates loss-of-coolant accidents (a major accident scenario for a nuclear reactor). This not only allows the amount of material used in the reactor building relative to plant output to be cut to about half of that for a large reactor, it also means the reactor can be installed in the form of factory-built modules, thereby considerably reducing both construction costs and construction risks and shortening construction time.

The intention for the future is to continue to develop the technology based around joint development in Japan and the USA with a view to encouraging investment in clean energy by improving public acceptance through measures that include alignment with government policies on nuclear power and taking account of users' opinions.
(Hitachi-GE Nuclear Energy, Ltd.)



2 Overview of BWRX-300 small modular reactor with superior economics