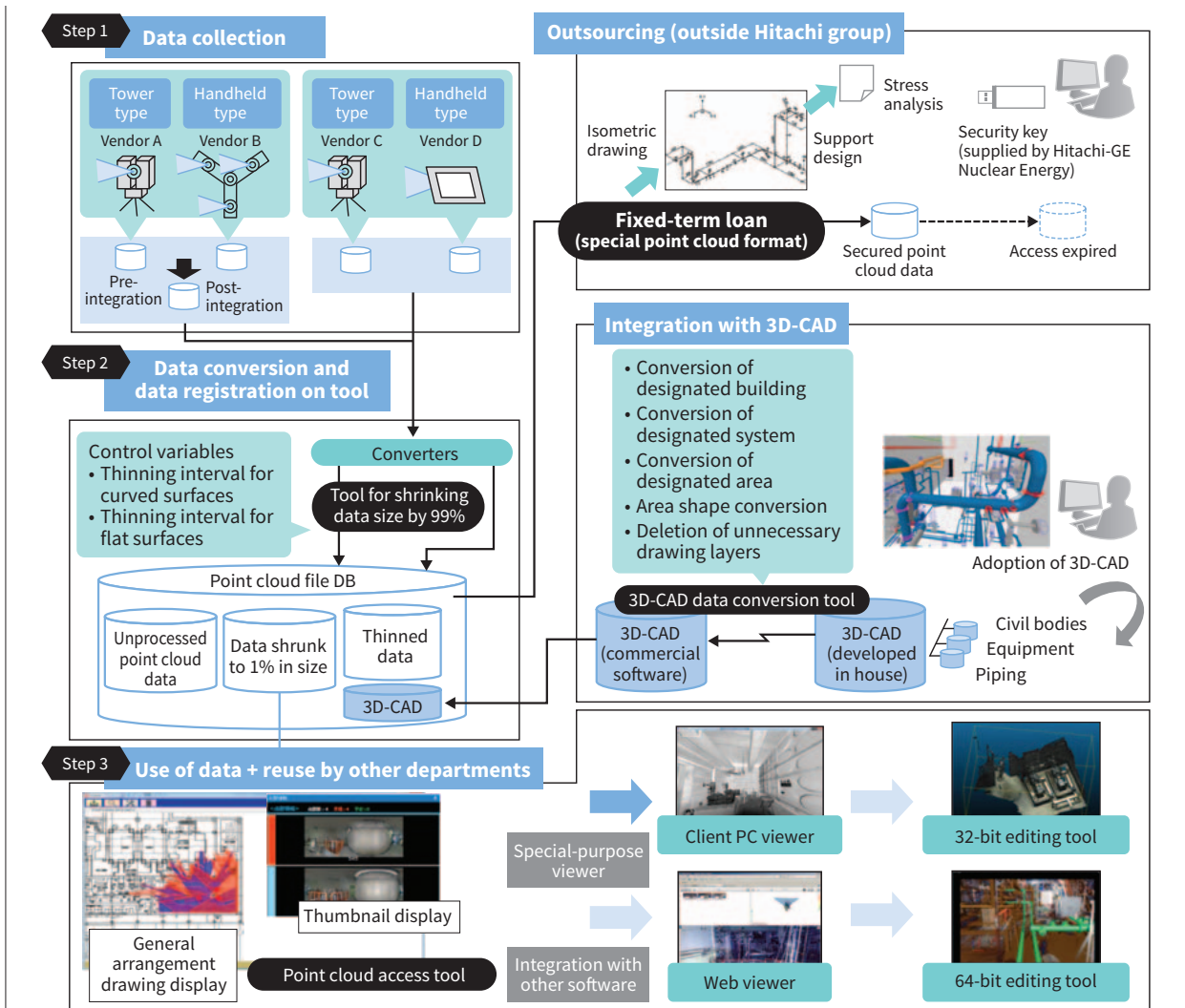


Nuclear Energy



DB: database

1 Infrastructure for use of point cloud data

1 Use of 3D Laser Measurement to Improve Efficiency of On-site Surveys and Rationalize Spatial Design

The engineering, procurement and construction (EPC) business for nuclear power plants of Hitachi-GE Nuclear Energy, Ltd. uses point cloud data for purposes that include the dimensional design of new piping installations at plants, the adoption of three-dimensional computer-aided design (3D-CAD), and fabrication

work drawing preparation. While use of point cloud data has been limited to individual design departments in the past, Hitachi is now seeking to minimize radiation exposure during on-site work and boost the efficiency of design work by making point cloud data available across multiple departments at Hitachi-GE Nuclear Energy and other group companies.

As part of this, it has developed a point cloud access tool to provide the infrastructure for shared access to point cloud data across different

departments. The tool supports the many different ways in which users utilize point cloud data by consolidating management of data in a variety of formats on a server, and is equipped with a special-purpose viewer and functions for integration with other software. Interfaces have also been enhanced by the development of the following techniques that allow users to access large amounts of point cloud data.

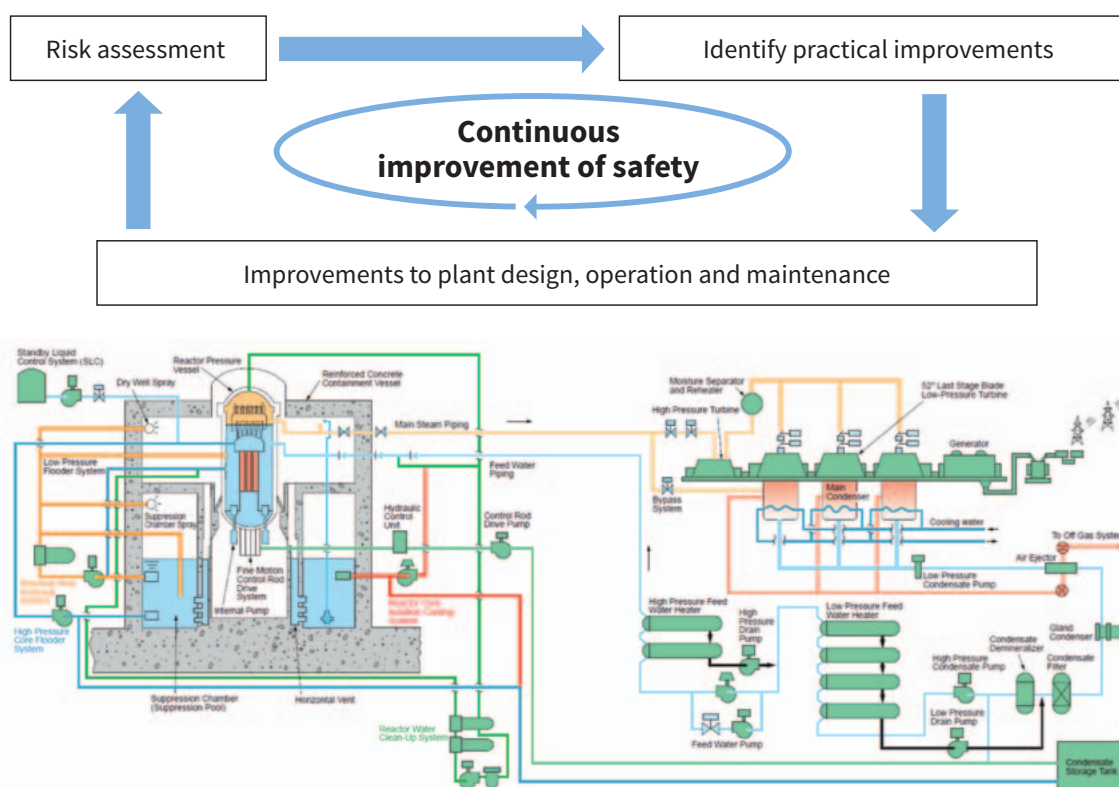
- (1) 3D-CAD data conversion tool with a part extraction function that can overlay on point cloud data
- (2) Tool for shrinking the size of point cloud data by 99% so users can utilize large amounts of the data without loss of productivity
- (3) Special formats that ensure high security when work is outsourced to other companies (Hitachi-GE Nuclear Energy, Ltd.)

2 Probabilistic Safety Assessment and Use of Risk Information

Probabilistic safety assessment (PSA) identifies a comprehensive list of potential accidents and quantifies their likelihood and consequences. Progress has been made through initiatives

in the nuclear industry around the world on developing PSA practices and using its results (risk-informed decision making).

Hitachi has established PSA practices and processes for risk-informed decision making through its nuclear power businesses in Japan and elsewhere. For its advanced boiling water reactor (ABWR) in particular, Hitachi has established PSA for assessing random equipment failures, internal hazards including fire, flooding, or heavy loads drop inside the facility, and external hazards including earthquake, tsunami, tornado, and accidental aircraft crashes. The facilities assessed include the nuclear reactor during power operation and during an outage, the spent fuel storage pool, and the spent fuel casks during transportation. Hitachi uses peer reviews by international experts to ensure the technical adequacy and quality of PSA, and has established processes for using the results of PSA to identify plant improvements that are practical and will significantly reduce the risk. Hitachi intends to continue using these PSA practices and risk-informed improvement processes to enhance safety of nuclear power plants. (Hitachi-GE Nuclear Energy, Ltd.)



2 Improvement processes for plant design and operational management