Title: Recent trends on interconnection of power storage facilities to real systems in Japan and the United States.

Joji Kawano
Deputy Senior Research Associate, Research Department, Japan Electric Power Information Center
Tokyo, Japan

Session XX

Keywords: power storage facilities, renewable energy, real systems

Abstract

Because renewable energy has a small environmental impact and its cost is extremely low, the amount of interconnection to the actual system is increasing to realize a low carbon society of the 21st century. However, since renewable energy is intermittent power generation and influenced by weather conditions, it is necessary to consider the influence on the system when introducing it; power generation by renewable energy is different from conventional power generation, and therefore, new solutions are necessary with increase of interconnection amount, in addition to an adjustment in the method of supply and demand. Adverse effects of increased renewable energy linkage to real systems are increasing today in Japan and other countries. One of the solutions against these problems is an interconnection to the grid of power storage facilities. This report explains the trend of the interconnection of power storage facilities to real systems, citing Japan and the United States as examples.

As an example of the interconnection of power storage facilities in Japan to the actual system, we introduce a demonstration project that the electric power company has worked on with the Ministry of the Environment. The demonstration project aims to increase the amount of interconnected renewable energy to the actual system, and the electric power company cooperates with the actual system of the isolated island to accumulate power storage facilities, and through a verification test, we verify its usability, problems, and cost. (Currently, the interconnection of power storage devices to actual systems in Japan is focused mainly on the customer side, and the interconnection in the power company is mainly based on the verification test stage.) In the future, however, since interconnection of power storage facilities is expected, it is necessary to organize current needs and tasks at electric power companies. (We are planning to summarize opinions on electricity companies regarding these needs and tasks, and the results will be reported on the forum.)

We will introduce case examples in the United States as examples of interconnection of power storage facilities to actual systems. In Indiana State, a 20 MW storage battery is connected to the real system for the purpose of improving reliability when linking to the real system of renewable energy. Also, in California State, a 37.5 MW storage battery is connected to a real system for the purpose of peak power shift. All cases of the introduction of these storage batteries in the US are actually being carried out by commercial-based services. Efforts in the United States are to install storage batteries in the urban areas as virtual power plants which can be expected to play similar roles as power generation facilities in densely populated areas near high demand areas that are difficult to implement with thermal power plants.