International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 15, 2019 (Special Issue)

Future Application of Smart grid by using Fuzzy-Neural

Sh SANJAY D. PATIL

Dy. Director

Power System Training Institute (NPTI) Banaglore-560070,India

Research Scholar, Dayananda Sagar University, Bangalore Key words :- SCADA,DCS,PMU

Abstract

A CYBER-CONTROLLED SMART GRID

A cyber-controlled smart grid consists of many distributed generation stations in the form of micro grids. The micro grids incorporate intelligent load control equipments in its design, operation and communication enable system. This enables the energy end users to serve them better way and indirectly control energy usage. Smart appliances such as refrigerators, washing machines, dishwashers and microwaves can be turned off if the energy end user elects to reduce management systems in smart buildings. This technology will enable the energy end users to control their energy consumption as well as the costs. Advanced communications capabilities in conjunction with smart meters and smart appliances enable the energy end users with the tools to take advantage of real- time electricity pricing and incentive-based load control. Furthermore, the emergency load reduction can be achieved by turning off millions of air conditioners on a rotation basis for a few minutes. With real-time pricing, the energy end users would have a very high incentive to become energy producers and install green energy sources. As real- time prices take hold, commercial and industry units are expected to generate their own energy and sell their extra power back to the power grid through the net metering.

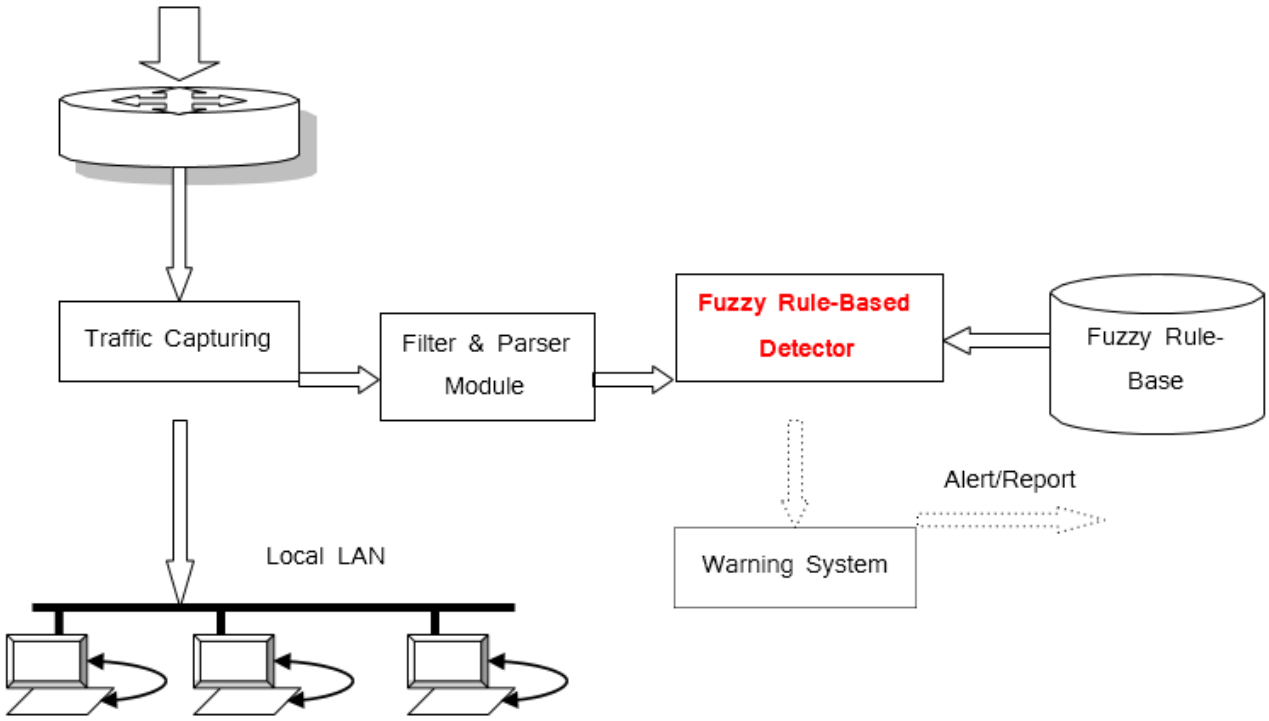
Cyber-controlled smart grid technology has three important elements: sensing and measurement tools (through SCADA), a smart transducer, and an integrated communication system. These elements monitor the state of the power system by measuring line flows, bus voltages, magnitude, and phase angle using phasor measurement(PMU) technology and state estimation. The technology is based on advanced digital technology such as microcontrollers/ digital signal processors. The digital technology facilitates wide-area monitoring systems, real-time line rating, and temperature monitoring combined with real-time thermal rating systems.

Transducers are sensors and actuators play a central role in automatic computerized data acquisition and monitoring of smart grid power systems. A smart transducer is a device that combines a digital sensor, a processing unit, and a communication interface. The smart/controller transducers/ controller is also able to locally implement the control action based on feedback at the transducer interface. The utilization of low-const smart transducers is rapidly increasing in embedded control systems in smart grid monitoring and control.

Real-time, two-way communication is enabling a new paradigm in the smart grid system. It enables the end users to install green energy sources and to sell energy back to the grid through net metering. The customers can sign up for different classes of service. Smart meters facilitate the communication between the customers by providing the real- price by the supplier. The customers can track energy use via Internet accounts, where the expected price of energy can be announced a day ahead for planning purposes and the real-time price of energy can be provided to end users so they may be aware of the savings that can be realized by curtailing their energy use when the energy system is under stress.

A smart meter allows the system operator to control the system loads. Load control ultimately provides new markets for local generation in the form of renewable green energy sources. With the installation of smart meters (i.e., a net metering system), end users can produce their own electric power from renewable sources as a captive generation and sell it to grid when they are not using by net metering.

Figure (A)


Traffic Capturing
Filter & Parser Module
Fuzzy Rule-Based Detector
Fuzzy Rule-Base
Alert/Report
Warning System
Local LAN