I-SP04

Fault Diagnosis

13:00 – 13:20   I-SP04-1

Diagnosis of Processing Equipment Using Neural Network Recognition of Radio Frequency Impedance Matching

Byungwhan Kim
(Sejong Univ.)

A new methodology is presented to diagnose faults in equipment plasma. This is accomplished by using neural networks as a pattern recognizer of radio frequency(rf) impedance match data. Using a real-time match monitor system, the match data were collected. The monitor system consisted mainly of a multifunction board and a signal flow diagram coded by Visual Designer. Plasma anomaly was effectively represented by electrical match positions. Twenty sets of fault-symptom patterns were experimentally simulated with experimental variations in process factors, which include rf source power, pressure, Ar and O_2 flow rates. As the inputs to neural networks, two means and standard deviations of positions were used.....

13:20 – 13:40   I-SP04-2

Transformer Differential Relay by Using Neural-Fuzzy System

V. Tipsuwanporn, A. Ekcheewanon, T. Suesut, J. Indra-payoong
(King Mongkut's Institute of Technology Ladkrabang),
A. Charean (Kasem Bundit Univ.)

This paper describes the synergism of Artificial Neural Network and Fuzzy Logic based approach to improve the reliability of transformer differential protection, the conventional transformer differential protection commonly used a harmonic restraint principle to prevent a tripping from inrush current during initial transformer's energization but such a principle can not performs the best optimization on tripping time. Furthermore, in some cases there may be false operation such as during CT saturation, high DC offset or harmonic containing in the line. Therefore an artificial neural network and fuzzy logic has been proposed to improve reliability of the transformer protection relay. By using EMTP-ATP the power transformer is modeled, all currents flowing ...

13:40 – 14:00   I-SP04-3

Proper Decision for Maintenance Intervals of Equipment in Power Stations by Considering Maintenance Replacement Rate and Operation Rate

Masatoshi Nakamura(Saga Univ.), Yoshihiro Suzuki,Hironori Hatazaki(Kyushu Electric Power co.,Ltd)

In this paper, the optimal maintenance scheduling for turbine with considering maintenance replacement rate was proposed in order to reduce the maintenance cost during the whole period of operation, meanwhile keeping current reliability of turbine. The proposed method is only based on a few limited available data with various factors relating to maintenance replacement and repair of turbine. The proposed method will be adopted by Kyushu Electric Power Co.,Inc. from April in 2002 to determine the maintenance schedule of thermal power plants.

14:00 – 14:20   I-SP04-4

Fault Detection and Diagnosis of Dynamic Systems with Sequentially Correlated Measurement Noise

B.S. Kim, Y.J. Lee, and K.Y. Kim(Cheju National Univ.)
I.S.Lee(Sangju National Univ.), D.Y.Lee, J.W>lee(KAERI)

An effective approach to detect and diagnose multiple failures in a dynamic system is proposed for the case where the measurement noise is correlated sequentially in time. It is based on the modified interacting multiple-model (MIMM) estimation algorithm in which a generalized decorrelation process is developed by employing the autoregressive (AR) model for the correlated measurement noise. Numerical example for the nuclear steam generator is provided to illustrate the enhanced performance of the proposed algorithm.

14:20 – 14:40   I-SP04-5

Neurofuzzy Estimation for Fault Location Based on PLC

V. Tipsuwanporn, S. Rukkaphan, V. Kongratana, A. Numsomran and Y. Tuppadung(King Mongkut's Institute of Technology Ladkrabang)

Generally, the application of Programmable Logic Controller (PLC) is emphasized on the Process Control. This paper presents Neurofuzzy application, Which can estimate the distance to a fault by means of PLC and based up on the Electrical Power System theory and ground resistance. The case study refers to the distribution lines of the Provincial Electricity Authority (PEA). Also, the thesis is supposed to be of much benefit: saving time both to go to the scene and to clear fault, reducing unpleasant impacts on customers and stabilizing reliability of the distribution lines.

14:40 – 15:00   I-SP04-6

Simplified neuron functions for FPGA evaluations of engineering neuron on gate array and analogue circuit

Masayuki saito, Qianyi Wang, and Tomoo Aoyama
(Miyazaki Univ.)

We estimated various neuron functions to construct of engineering neurons, which are the combination of sigmoid, linear, sine, quadric, double/single bended, soft max/minimum functions. These combinations are estimated by the property on the potential surface between the learning points, calculation speed, and learning convergence; because the surface depends on the inference ability of a neuron system; and speed and convergence are depend on the efficiency on the points of engineering applications. After the evaluating discussions, we can select more appropriate combination than original sigmoid function's, which is single bended function and linear one. The combination ...