

## Development of Signal Acquisition Software for Eddy Current Test

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### 1. Introduction

Eddy current test (ECT) system for steam generator tubes is one of the principal tools for the in-service inspection of nuclear power plants. There is no domestic ECT system for the steam generator tubes. Foreign systems are very expensive. Moreover, the maintenance and repair of the system are not prompt. In order to settle such problem, new ECT system has now been developed in KHNP Central Research Institute. In this paper, the composition and functions of the steam generator ECT data acquisition system are introduced.

### 2. Data Acquisition Program

#### 2.1 Introduction

The flow chart for the eddy current signal acquisition program is illustrated in Fig. 1. As shown by Fig. 1, the eddy current data acquisition system consists of several program modules. The program modules are dependent on hardware. The data are acquired in the file server by a program governing the communication with and a program governing the control of the hardware system.

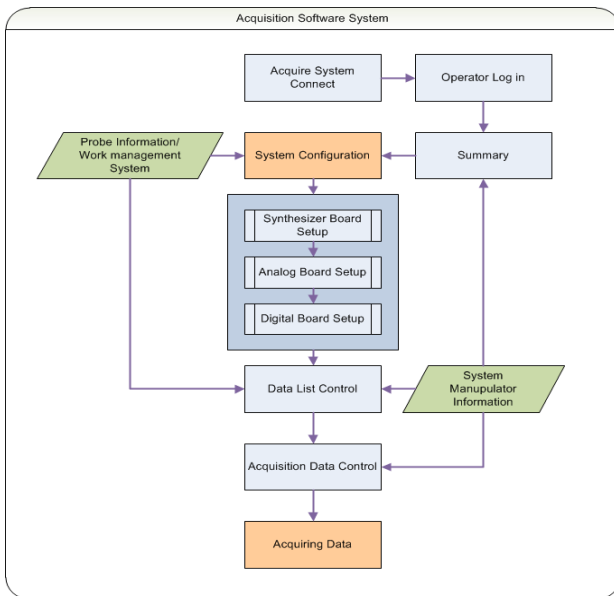


Fig. 1 Data Acquisition System Flow Sheet

#### 2.2 Composition of Data Acquisition Program

The set-up variables for inspection technique are important in the signal acquisition program. The methods for the set-up variables for inspection technique have been developed in two directions. The first one, which is old method, is to establish the variables needed to apply inspection technique entering classified items manually for each inspection technique. The second one, which is new method, is to establish the variables for the inspection technique applying inspection Wizard successively. This method is to complete the establishment with successive method entering to the next item automatically in order after establishing one item. The main page for the signal acquisition realizing that method is shown in Fig. 2.

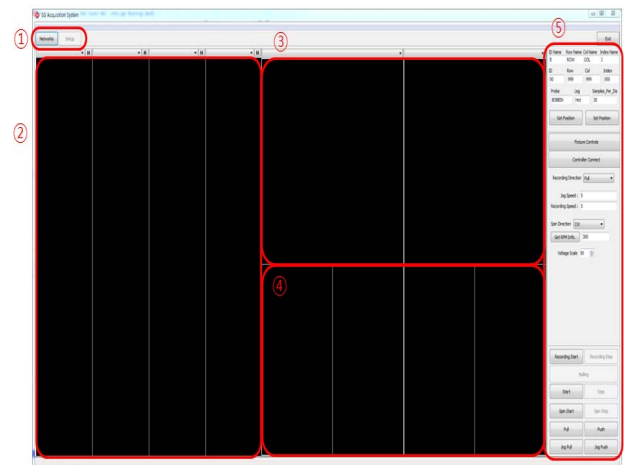


Fig. 2 The composition of main window for signal acquisition

- ① Networks : IP/Port window is produced after establishing Network Setting window
- ② Long Strip Chart
- ③ Main Lissajous Chart
- ④ Expanded Lissajous Chart
- ⑤ File information : ID Name, Row Name, Col Name, Index Name, ID, Row, Col, Index, Probe, Leg, Samples\_Per\_Dis Displaying information

#### 2.2 Important Characteristics of Signal Acquisition Program

The important characteristics of the signal acquisition program are follows:

### 2.2.1 Hardware Setup

In order to conduct the signal acquisition process reliably, the set-up values for hardware device should be applied correctly. The important set-up values are related to the board choice, mode, sampling rate, frequency, voltage, analog board coil type, coil setting and auto setting. Figure 3 illustrates the principal window for the hardware set-up.

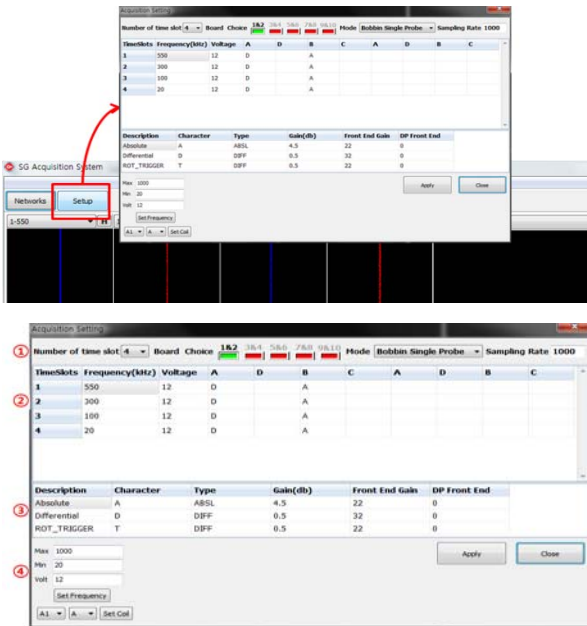


Fig. 3 Hardware Setup and Pod control window

### 2.2.2 Fixture, Push/Puller Control

In order to acquire the eddy current signal effectively, many information should be contained in database and the database should be managed correctly. The flow chart for controlling SM-25, which is a device to control the fixture and pusher/puller to acquire data effectively, is shown in Fig. 4. Figure 5 illustrate the window of the program controlling SM-25.

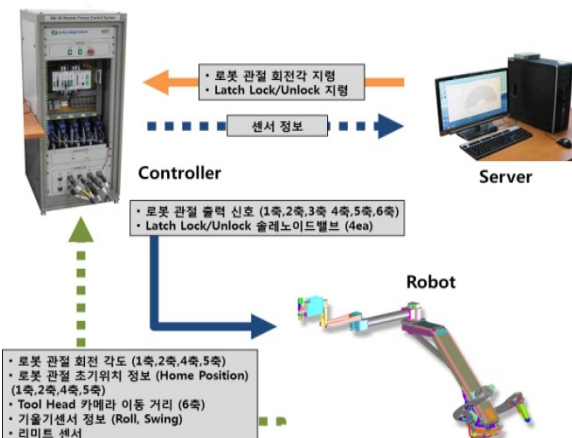


Fig. 4 The program concept controlling SM-25

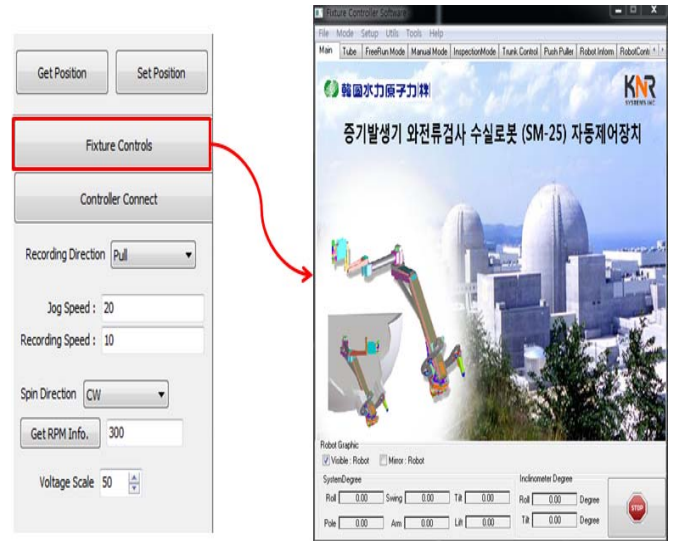


Fig. 5 Fixture, Push/Puller Control Program

## 3. Conclusions

Central Research Institute of KHNP has been developing the hardware and software for the inspection system applicable to the steam generator tubes in nuclear power plants in Korea. In this paper, the constitution and functions of the eddy current acquisition system for the steam generator tube are introduced. The system will be improved by solving the problems possibly appeared during the site application. KHNP will be independent on the techniques of foreign engineering companies and have the most effective eddy current system after completing the project.

## REFERENCES

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