A.11: Parameter Deviation Alarms System (PDAS) for Indus-2

Indus machine parameter database has thousands of parameters which are being logged at different rates during regular machine operation. These parameters also happen to have very high accuracy and stability requirements. Proper machine operation depends on complex relation of a number of parameters which should remain within some tolerance limits. Abnormal system states like trips are indicated by the alarm handling system. The need was felt to also have alarms raised whenever any of the several critical parameters varied beyond the allowable limits. The developed system facilitates monitoring a range of online alterable critical parameters for deviations beyond the normal limits and raises the alarm in the control room. Thus, any abnormal deviations of parameters are timely brought to the notice of machine operators for needful action. This is aimed at facilitating easier diagnostics of machine malfunctions which, in turn would help to keep the machine down time low. The system works on the current values of parameters and caters to 138 power supplies of Indus-2 and 36 PS of TL3. It also caters to parameters of Indus-2 RF system.

Main Implementation Issues:

- Determining the correct deviation limit (±Δ% of set point) for the various parameters on which the deviation alarms had to be configured. For this, historical data was analyzed.
- Various states of machine like *ready for injection, injection on, ramping* or *cycling* of all PS and *beam ready* had to be handled for alarm generation.
- Handling various states of devices (On/Off, Local/Remote, Ready/ Not ready, DC/Ramp mode and reference transition).
- Taking care of control system states depending on status of different layers of control system.
- Implementing dependencies and information flow between the alarm detection process and user interfaces.
- Implementing the system in PVSS SCADA environment with minimum memory or processing load over the existing system.

Salient Features:

- All the allowable parameter deviation limits are configurable based on *power supply state* and *alarm activation threshold.* These are stored in a text file and loaded on startup of the application.
- The alarms can be enabled and disabled using configuration file.
- All alarms are logged in the central database.
- The sub-system GUI panel displays the alarm by changing the visual attributes of the parameter display widget.
- The alarms are also routed to central alarm panel from where these can be acknowledged.
- A detail panel shows the current set value, read back value and difference values.

Implementation Details:

- The alarm generation module runs on layer-1 of control system (PVSS server). It runs as an independent process which if stopped will not affect the other running processes.
- The parameter deviation details panel is shown in Fig. A.11.1 and alarm configuration panel is as shown in Fig. A.11.2.

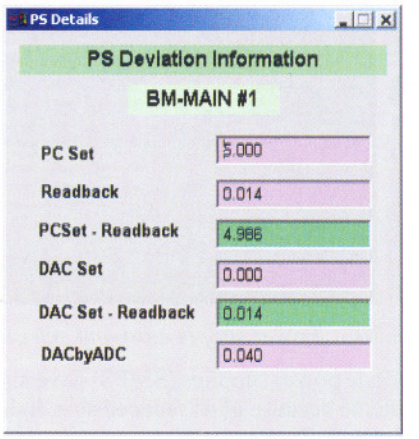

Fig. A.11.1: Parameter Deviation Details of a PS

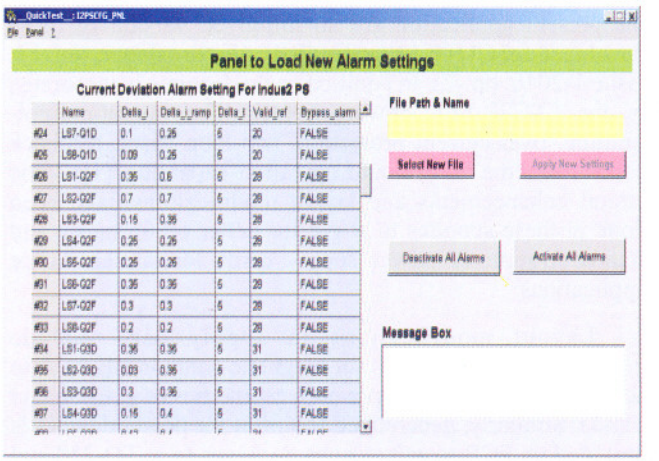

Fig. A.11.2: Alarm Configuration Panel

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