Project Title:

Development of fault detection strategies in power plant rotating machinery and development and implementation of an on-line fault detection system for predictive maintenance of rotating machinery on a typical power plant by vibration and motor current analysis

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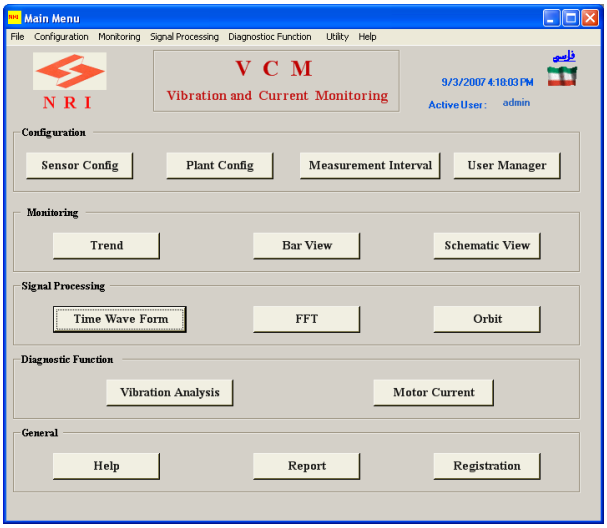
Summary:

In this project fault diagnosis methods in rotating machinery were studied and appropriate maintenance strategy was determined for every one of main power plant machines. Then an on-line monitoring and fault diagnosis system (VCM) utilizing vibration analysis and motor current analysis methods was designed and successfully implemented on a boiler feed water pump in the Montazer Ghaem combined cycle power plant. The VCM (Vibration & Current Monitoring) consists of a hardware part (such as sensors, signal conditioners and A/D card) and a software part (including data acquisition, signal processing and fault diagnosis).
In the Montazer P.P. vibration probes and CT of the motor have been used in the VCM system, so the expenses was sensibly decreased.
The VCM system can be implemented in any power plant or large factories and its hardware parts can be changed in order to use power plant's vibration probes and to be more economical.
The VCM software is designed for on-line monitoring of the rotating machinery. It monitors the vibration and motor current signals and controls the alarm and trip limits and saves the data to do more analysis and fault diagnosis.



Project Results:

- ☞ Development of fault detection strategies in power plant rotating machinery
- ☞ Design of an on-line fault detection system for predictive maintenance of rotating machinery by vibration and motor current analysis
- ☞ Implementation of an on-line fault detection system for predictive maintenance of rotating machinery (VCM) on the Montazer Ghaem power plant by vibration and motor current analysis

Project Documentation:

- "Development of fault detection strategies in power plant rotating machinery", PMEPN08/T1, Mechanical Systems Department; Power Generation Research Center, NRI; Feb. 2006.
- "Study and select a power plant to implement the VCM system", PMEPN08/T2, Mechanical Systems Department; Power Generation Research Center, NRI; July. 2006.
- "Study on the equipment and machinery of the selected power plant", PMEPN08/T3, Mechanical Systems Department; Power Generation Research Center, NRI; Jan. 2007.
- "Primary design of the VCM software", PMEPN08/T4, Mechanical Systems Department; Power Generation Research Center, NRI; Jan. 2007.
- "Study on CM and vibrational standards and economical calculation of CM methods", PMEPN08/T5, Mechanical Systems Department; Power Generation Research Center, NRI; Mar. 2007.
- "Implementation and test of the VCM system in the laboratory", PMEPN08/T6, Mechanical Systems Department; Power Generation Research Center, NRI; Sep. 2007.
- "Design and product the DAQ software", PMEPN08/T7, Mechanical Systems Department; Power Generation Research Center, NRI; Sep. 2007.
- "Final design of the VCM software", PMEPN08/T8, Mechanical Systems Department; Power Generation Research Center, NRI; Sep. 2007.
- "Literature survey and Implementation and test of the VCM system in the power plant", PMEPN08/T9, Mechanical Systems Department; Power Generation Research Center, NRI; Sep. 2007.
- "Final report of the project", PMEPN08/T10, Mechanical Systems Department; Power Generation Research Center, NRI; Dec. 2007.