MARCOS RODRIGUES DE CARVALHO: Brazil

Vibration Measurement Using Wireless Technology.

Mr. Marcos Rodrigues de Carvalho, of the Instituto de Pesquisas Energeticas e Nucleares (IPEN) in São Paulo, Brazil participated in an International Atomic Energy Agency (IAEA) fellowship at the University of Tennessee, Knoxville, USA under the direction of Dr. Belle Upadhyaya. The purpose of his fellowship was to implement a predictive maintenance program using wireless vibration measurements at the IPEN-CNEN-SP research reactor IEA-R1. Mr. Rodrigues de Carvalho has worked as coordinator of maintenance since 1997 at IPEN. IEA-R1 is a swimming pool type reactor that is cooled and moderated by light water and uses graphite and berillium as reflectors. The reactor has been licenced to operate at a maximum thermal power of 5 MW. The reactor first achieved criticality on September 16, 1957.

Mr. Rodrigues de Carvalho's fellowship consisted of bibliographic review, technical discussions, as well as workshops with Mr. Wayne W. Manges and Mr. Teja Kurunganti from Oak Ridge National Laboratory. He also visited the Department of Nuclear and Radiological Engineering at the University of Tennessee laboratories and the Company Analysis and Measurement Services Corporation, headed by Dr.Hashemian.

Technical discussions with Dr. Upadhyaya and bibliographic reviews were very helpful, because it established a direction to predictive maintenance program implementation. Additionally, the workshop conducted by Mr. Wayne W. Manges and Mr. Teja Kurunganti, provided implentational ideas for possible new research areas. These could be incorporated in Brazil by Mr. Rodrigues de Carvalho in wireless sensors, data acquisition, and on-line equipment monitoring.

With the information gathered from the workshop and visits to the Department of Nuclear Engineering at the University of Tennessee laboratories and the nuclear industry services company Analysis and Measurement Services Corporation, Mr. Rodrigues de Carvalho will be able to start vibration analysis of cooling tower fans at the research reactor IEA-R1 using wireless equipment. These are purchased through the IAEA fellowship program. The goal is to extend the measurements in the future to other rotating equipment, thus completing the research reactor IEA-R1 predictive maintenance program, in Brazil.

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