

INFORMATION SHEET



INTERNATIONAL ATOMIC ENERGY AGENCY

Ref: 621-12-TM-26931

TECHNICAL MEETING

On

**“On-line Condition Monitoring of Equipment and Processes in Nuclear Power Plants
Using Advanced Diagnostic Systems”**

**27 to 30 June 2005
Knoxville, Tennessee
USA**

Hosted by

Analysis and Measurement Services Corporation

AMS 9111 Cross Park Drive, Building A-100

Knoxville, TN 37923 USA

Phone: (865) 691-1756

Fax: (865) 691-9344

E-Mail: info@ams-corp.com

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INTERNATIONAL ATOMIC ENERGY AGENCY

621-12-TM-26931

Technical Meeting on “On-line Condition Monitoring of Equipment and Processes in Nuclear Power Plants Using Advanced Diagnostic Systems”

27 to 30 June 2005

Organized in cooperation with Analysis and Measurement Services Corporation
Knoxville, Tennessee, USA

within the IAEA’s activities conducted under the guidance and support of the Department of
Nuclear Energy’s Technical Working Group on Nuclear Power Plant Instrumentation and Control

INFORMATION SHEET

1. INTRODUCTION

This announcement is for a technical meeting to be held over the period of June 27 to 30, 2005. The meeting is organized by the IAEA and hosted by the Analysis and Measurement Services Corporation (AMS) of Knoxville, Tennessee, USA. The meeting will include technical paper presentations and discussion sessions.

2. OBJECTIVE OF THE MEETING

The purpose of the meeting is to provide an international forum for presentations and discussions of experience with the development, validation, and implementation of on-line monitoring techniques for instrument calibration verification, equipment condition monitoring, and diagnostics of equipment and process anomalies. Both current trends and potential for future activities will be included with a focus on implementation of on-line monitoring in current generation of reactors and its potential for next generation of reactors.

3. BACKGROUND

Great efforts have been spent over the last two decades to develop new technologies for passive detection of equipment and process anomalies using existing signals from existing sensors. These efforts followed earlier work in the area of noise analysis technology developed in the 1970s and 1980s that provided a powerful set of passive techniques for surveillance and diagnostics in nuclear power plants.

Referred to as “on-line monitoring” techniques, these new developments have a number of useful applications in nuclear power plants and other industries. For example, on-line monitoring has been used successfully to verify the calibration of pressure, level, and flow transmitters in nuclear power plants. This has helped reduce the frequency of calibration of the transmitters and the associated manpower and personnel radiation exposure. In addition, it has provided substantial indirect benefits such as reduction of calibration-induced plant trips, human errors, and damage to the plant equipment.

4. RELATED IAEA ACTIVITIES

IAEA is currently completing a TECDOC entitled “On-line Monitoring of Sensor Performance in Nuclear Power Plants.” The focus of this TECDOC is on the use of on-line monitoring techniques to extend the calibration intervals of instrument channels in nuclear power plants. A follow-up TECDOC will be launched in the spring of 2005 to continue this effort towards development of guidelines on applications of on-line monitoring beyond instrument calibration reduction. More specifically, the new TECDOC will be aimed at equipment and process condition monitoring.

Together, the two TECDOCs mentioned above are expected to provide the international nuclear power community with the latest information on all applications of on-line monitoring implementation in nuclear power plants.

5. LOCATION OF MEETING

The location of the meeting is Knoxville, Tennessee, USA. The details will be provided later. This location was selected based on its proximity to a number of organizations which

have been involved in development of equipment condition monitoring technologies for nuclear power plants. For example, Knoxville, Tennessee is the home of the University of Tennessee, whose nuclear engineering department has been involved in the equipment condition monitoring area for nearly three decades. Knoxville is also close to Oak Ridge National Laboratory (ORNL), the Watts Bar nuclear power plant, and the Kingston steam plant of the Tennessee Valley Authority (TVA). ORNL is the largest national laboratory of the United States and the site of a number of major activities in support of nuclear energy. For example, ORNL pioneered much of the noise analysis techniques that are used for non-intrusive diagnostics in nuclear power plants and for measurement of instrument performance indicators. ORNL continues to work towards the advancement of instrumentation systems and diagnostic techniques not only for current generation of nuclear power plants, but also for the future generation of nuclear power plants (i.e. the Generation IV reactors).

The Watts Bar nuclear power plant, as well as the Kingston steam plant, have both been the site of applications of on-line monitoring technologies of the Electric Power Research Institute (EPRI). EPRI has been the sponsor of a number of important research and development (R&D) projects on development of means for instrument calibration verification and equipment condition monitoring using on-line monitoring techniques. These efforts are continuing through the EPRI offices in Charlotte, North Carolina, that is also close to Knoxville, Tennessee. The host of the meeting in Knoxville will be the Analysis and Measurement Services Corporation (AMS) who is a partner with the Halden Reactor Project in Norway to commercialize on-line monitoring technologies within the worldwide nuclear power industry. AMS developed its technologies under R&D projects that were funded by the U.S. Nuclear Regulatory Commission (NRC). Recently, AMS performed the first commercial implementation of on-line calibration monitoring at the Sizewell nuclear power plant in the United Kingdom.

6. ORIGIN OF ON-LINE MONITORING TECHNOLOGY DEVELOPMENTS

On-line monitoring technology developments date back to the late 1970s and early 1980s following the accident at the Three Mile Island (TMI) nuclear power plant in the USA. The accident revealed the need for reliable signals from process instrumentation in nuclear power plants, and led to the development of signal validation techniques under projects sponsored by the U.S. Department of Energy (DOE), EPRI, and others in the USA, and efforts

carried out in a number of organizations outside the U.S., such as the EdF of France and the Halden Reactor Project in Norway.

DOE's projects were originally carried out at the Argonne National Laboratory (ANL) site in Idaho (ANL – West), and later in Chicago (ANL – East). At ANL - East, analytical modeling techniques were developed for a variety of applications in nuclear power plants, aviation industry, and others. The Multivariate State Estimation Technique (MSET) is one of the well-known products of ANL that has been used in a number of industries in addition to the nuclear industry for equipment condition monitoring.

7. TECHNICAL TOPICS

Technical papers and presentations are invited on the subject of on-line monitoring and its applications in nuclear power plants. All papers will be reviewed for technical accuracy, relevance to the topic of the meeting, and freedom from commercial content or product advertisements.

New and original work, as well as experience with implementation of already-developed techniques for on-line condition monitoring in nuclear power plants are of main interest. The following list provides examples of papers and presentation topics that will be appropriate for the meeting:

- Latest Developments in Analytical Modeling Techniques for Equipment and Process Condition Monitoring
- Experience with Implementation of On-Line Monitoring Techniques in Nuclear Power Plants
- Results of New and On-Going R&D in the Area of Condition Monitoring
- Means to Acquire Process Data for On-Line Condition Monitoring
- On-Line Monitoring Data Management Software
- On-Line Monitoring Data Analysis Algorithms and Software
- Multi-Channel High-Speed Data Acquisition Systems

- Environmental Monitoring to Extend the Life of Electronics and Other Equipment
- On-Line Diagnostics and Incipient Failure Detection Techniques
- Baseline Reference Measurements Performed During Commissioning
- Use of On-Line Monitoring to Demonstrate Compliance with Safety Analysis Requirements
- Plant Economy and Safety Enhancements Through On-Line Monitoring Technology
- Role of On-Line Monitoring in Plant-Life Extension
- On-Line Detection of Venturi Fouling
- On-Line Detection of Flow Anomalies
- Rod Control System Troubleshooting
- Testing Effectiveness and Time Response of Shutdown Systems
- Use of On-Line Monitoring to Comply with “NRC Maintenance Rule”
- Cost/Benefit Analysis of On-Line Monitoring Implementation in Nuclear Power Plants
- Application of On-Line Monitoring Techniques in Next Generation of Reactors
- Regulatory Requirements for Implementation of On-Line Monitoring Techniques in Nuclear Power Plants
- Quality Assurance and Software Verification and Validation (V&V) Aspects of On-Line Monitoring Implementation in Nuclear Power Plants
- Examples of Successful Implementation Projects
- On-Line Monitoring System Development
- Uncertainty of On-Line Monitoring Results
- Relationship With Setpoint Analysis
- Direct and Indirect Benefits and Shortcomings of On-Line Condition Monitoring

8. MEETING OFFICIALS AND ORGANIZATION

The meeting will be staffed by a number of IAEA and AMS personnel to include the following designated officials:

MEETING CHAIRMAN:

Hash Hashemian
Analysis and Measurement Services Corporation
AMS 9111 Cross Park Drive, Bldg. A-100
Knoxville, Tennessee 37923 USA
Tel: 1 865-691-1756
Fax: 1 865-691-9344
E-mail: hash@ams-corp.com
Website: www.ams-corp.com

MEETING CO-CHAIRMAN:

David Holcomb
Oak Ridge National Laboratory
Nuclear Science and Technology Division
Bethel Valley Road, X-10 Plant
P.O. Box 2008, Bldg. 3500
Oak Ridge, TN 37831-6004
Tel: 1 865-576-7889
Fax: 1 865-241-4074
E-mail: HolcombDE@ornl.gov

IAEA SCIENTIFIC SECRETARY:

Oszvald Glöckler
International Atomic Energy Agency
Wagramer Strasse 5
P.O. Box 100
A-1400 Vienna, Austria
Tel: 43 1 2600 22791
Fax: 43 1 2600 29598
E-mail: O.Glockler@iaea.org

MEETING ADMINISTRATOR:

Mrs. Elain Crumley
Analysis and Measurement Services Corporation
AMS 9111 Cross Park Drive, Bldg. A-100
Knoxville, Tennessee 37923 USA
Tel: 1 865-691-1756, ext. 115
Fax: 1 865-691-9344
E-mail: crumley@ams-corp.com

All official correspondence shall be forwarded to the IAEA Scientific Secretary with a copy to the Meeting Chairman. All technical correspondences shall be addressed to the Meeting Chairman with a copy to the Scientific Secretary. All correspondences regarding the administrative aspects of the meeting in the USA shall be addressed to the AMS Meeting Administrator.

Participants are responsible for their own travel arrangements, transportation, and related costs.

9. PARTICIPATION

All persons wishing to participate in the meeting in Knoxville, Tennessee are requested to complete the attached Participation Form and to send it to the IAEA before 29 April, 2005.

Official correspondence with regard to participation in the meeting should be addressed to Mr. Oszvald Glöckler, IAEA Division of Nuclear Power, Scientific Secretary of the meeting.

10. PRELIMINARY SCHEDULE OF THE MEETING

The meeting will begin on June 27, 2005 at 9:00 a.m. and will end on June 30, 2005 at 5:00 p.m. A technical tour and a cocktail reception followed by an official dinner are planned. The cocktail reception and the official dinner will be hosted by AMS.

Inquiries regarding the meeting location in the USA can be addressed to the Meeting Administrator at the following address:

Mrs. Elain Crumley
Analysis and Measurement Services Corporation
AMS 9111 Cross Park Drive, Bldg. A-100
Knoxville, Tennessee 37923 USA
Tel: 1 865-691-1756, ext. 115
Fax: 1 865-691-9344
E-mail: crumley@ams-corp.com

The agenda for the meeting and details on local arrangements in the USA will be sent to participants when completed participation forms are received. If you are interested in the technical tour, your request must be sent to Mrs. Linda Dockery of ORNL at dockerylb@ornl.gov

or fax 1 865-241-1050 no later than April 29, 2005. She will send you the necessary forms for participation in the tour. A copy of your request should also be sent to the meeting administrator, Mrs. Elain Crumley of AMS at crumley@ams-corp.com or fax 1 865-691-9344.

11. SUBMISSION OF SUMMARIES AND PAPERS

Each designated participant wishing to present a paper on the topics outlined in the announcement should send a summary of approximately 300 words to the following reviewers. Paper submission or presentation is not required for participation.

1. Hash Hashemian, President
Analysis and Measurement Services Corporation
AMS 9111 Cross Park Drive, Bldg. A-100
Knoxville, Tennessee 37923 USA
Tel: 1 865-691-1756
Fax: 1 865-691-9344
E-mail: hash@ams-corp.com

2. Oszvald Glöckler, Scientific Secretary
International Atomic Energy Agency
Wagramer Strasse 5,
P.O. Box 100
A-1400 Vienna, Austria
Tel: 43 1 2600 22791
Fax: 43 1 2600- 29598
E-mail: O.Glockler@iaea.org

The abstracts should be received no later than April 29, 2005. Abstracts will be used to select the papers for the meeting and to establish the final programme. Authors will be notified about the acceptance of their papers no later than May 15, 2005. The full paper should be submitted by no later than June 15, 2005.

Full papers should be prepared in MS Word format and not exceed 14 pages in length, including illustrations and references. Authors will be requested to bring the electronic copy of their paper(s) to the meeting for the production of the proceedings.

Time for the presentation of the papers will be limited to 25 minutes in order to have sufficient time for discussion. Overhead projectors and PC-based projection will be provided.

12. WORKING LANGUAGE

The official working language of the meeting will be English and no interpretation will be provided.

13. VISAS

Designated participants who require a visa to enter the USA should submit the necessary application to the nearest USA diplomatic or consular representative within the appropriate timeframe. A formal invitation letter from IAEA or AMS may be arranged if needed and as appropriate. This will require a request in writing from the participant and his/her employer. These letters will be provided only after the participation of the individual is confirmed and upon approval of IAEA.

14. ACCOMMODATION, TRANSPORTATION, AND MEALS

Participants shall make their own arrangements for accommodations, transportation, and meals. The location of the meeting will be the Hotel Holiday Inn Select Cedar Bluff, located at 304 Cedar Bluff Road, Knoxville, 37923, USA; phone: 1 865-693-1011; fax: 1 865-694-0253; e-mail: dmontgomery@cedarbluff.hiselect.com. All participants are required to pay for their hotel room and meals individually.

15. EXPENDITURES

There is no registration fee for the meeting. All expenses related to participation in this meeting, such as travel, accommodations, and transportation expenses are to be covered by the participants.

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Using Advanced Diagnostic Systems”**

**27 to 30 June 2005
Knoxville, Tennessee, USA**

PARTICIPATION FORM

Please send a copy of this form (and abstract, if applicable) before 29 April 2005 to both of the following:

- Oszvald Glöckler, International Atomic Energy Agency, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria; fax: 43 1 2600 29598; e-mail: O.Glockler@iaea.org
- Hash Hashemian, Analysis and Measurement Services Corporation (AMS), 9111 Cross Park Drive, Knoxville, Tennessee, 37923; fax : 1 865-691-9344; e-mail: hash@ams-corp.com

Surname:		
Given Names:		Dr./Mr./Ms.:
Date/Place of Birth:	Passport #: Expire date :	Nationality:
Title and position:		
Organization/Company:		
Full address:		
Tel:	E-mail:	Fax:
I intend to present a paper and enclose a 300 word extended summary: With the following title:		
No Yes		

ACCOMODATION BOOKING FORM

Technical Meeting on

**“On-line Condition Monitoring of Equipment and Processes in Nuclear Power Plants
Using Advanced Diagnostic Systems”**

27 to 30 June 2005

Knoxville, Tennessee - USA

To be sent to:

Please send a copy to:

<p>Hotel: HOLIDAY INN SELECT CEDAR BLUFF 304 Cedar Bluff Road Knoxville, TN 37923 USA Tel.: 1 865-693-1011 Fax : 1 865-694-0253 E-mail: dmontgomery@cedarbluff.hiselect.com</p>	<p>Administration secretary Mrs. Elain Crumley Analysis and Measurement Services Corp AMS 9111 Cross Park Drive, Bldg. A-100 Knoxville, Tennessee 37923 USA Tel: 1 865-691-1756, ext. 115 Fax: 1 865-691-9344 E-mail: crumley@ams-corp.com</p>
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**Please send this form NO LATER THAN 1 May 2005
(Note: Participants are responsible for their own travel,
hotel, and transportation arrangements and the payment of the cost)**

Name:	
Title/Position:	
Organization and Address:	
Telephone and Fax:	E-Mail:
Arrival Date/Time:	Departure Date/Time:
Accompanying person?	
Occupancy (Please circle one): SINGLE DOUBLE	
Method of Payment (in U.S. Dollars):	Cash/Traveler’s Check/Credit Card: Card Number: Exp:
Deposit for Late Arrival (After 6PM)	