



INTERNATIONAL SYMPOSIUM, PORTOROZ, YUGOSLAVIA  
5-9 SEPTEMBER 1977

The meeting was attended by 190 participants from 26 Member States and  
3 international organizations.

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# The Monitoring of Radioactive Airborne and Liquid Releases from Nuclear Facilities

A requirement of over-riding importance in the development of nuclear programmes is that there should be no unacceptable risk of damage from radiation to either the workers who are engaged in the programmes or to the general public. Standards based on the recommendations of the International Commission on Radiological Protection have been developed, and from these standards upper limits have been derived for the exposure of the workers and the public to external and internal radiation. Assurance of compliance with the limits for workers is produced by monitoring programmes conducted within the facility. Any contribution from the facility to the exposure of the public is attributable in the main to the radionuclides released to the environment in airborne or liquid forms. Much effort has been expended in recent years in establishing limits on such releases in order to ensure that the radiation doses received by the public at present, and at any time in the future, are kept as far as is reasonable achievable below the individual dose limits, and the Agency has played a prominent part in this work.

An effective system for monitoring the airborne and liquid releases from each facility is of vital importance in ensuring continuing compliance with the authorized limits. The Agency is at present engaged in preparing, with the help of a group of experts, a manual of guidance on the design and operation of such monitoring systems.

The purpose of this symposium, which was organized with the assistance of the Jozef Stefan Institute, Ljubljana, was to discuss on a broad international scale the current state of the art of monitoring airborne and liquid releases from different types of nuclear facilities. Forty-four papers were presented in eight sessions, including review papers by three of the specialists engaged in the preparation of the Agency's manual of guidance.

The first session dealt with the objectives of effluent monitoring, and the introductory paper identified the following main aims: assurance of compliance with the authorized limits and with any other more restrictive limits imposed by the operator of the facility; verification that the facility control systems are functioning correctly; provision of data for assessing the need for any supplementary environmental monitoring; provision to outside authorities of data for estimating the exposure of the public and for improving scientific knowledge on the behaviour of radionuclides in the environment; detection and identification of the nature and extent of any unplanned or unexpected releases to permit any necessary corrective action to be taken. Subsequent papers discussed the design of adequate monitoring programmes for different types of facilities in different countries.

In other sessions, many papers dealt in considerable detail with available techniques and instruments for monitoring airborne streams, mainly through stacks, of contaminated particulates, radio-iodines, radioactive noble gases, tritium and carbon-14, and contaminated liquids, which are usually collected in holding tanks before being released to receiving bodies of water. For some purposes, the airborne release streams can be monitored directly in the stack; for others, samples are collected and the activity in each sample is later measured in the laboratory. A sampling technique is almost always used for liquid releases. Great care has to be taken to ensure that the sample collected is truly representative of the release.

A distinction can be drawn between the type of monitoring which is needed to ensure compliance with the authorized limits and a more sensitive type, often using specialized techniques, which will provide useful data for scientific purposes. A wide range of instrumental response is also required to give useful information on unplanned releases which might significantly exceed the authorized limits. Attention was given to the need for harmonization of methods to permit intercomparison of results and to the reporting of the results of monitoring in a manner which will facilitate a continuing check of compliance with regulatory prescriptions.

The last session dealt with national requirements in a number of Member States and the practical experience acquired in applying these requirements to the monitoring of effluents from different types of facilities.

It appears that adequate effluent monitoring techniques are available to satisfy the needs of the three interested parties: the operator, who needs assurance that his facility is functioning in accordance with the applicable regulatory limits; the regulatory authority, which requires the demonstration of compliance with the authorized limits; the public, who requires assurance that the population and the environment are being adequately protected. The importance of maintaining credibility was stressed and means of doing so were suggested.

The meeting ended with the review by a group of representative experts of the current status and likely future development of important facets of effluent monitoring. The group also discussed and answered specific questions raised by the participants.

The proceedings of the symposium, comprising the papers presented and the discussions to which they gave rise, will be published by the Agency.