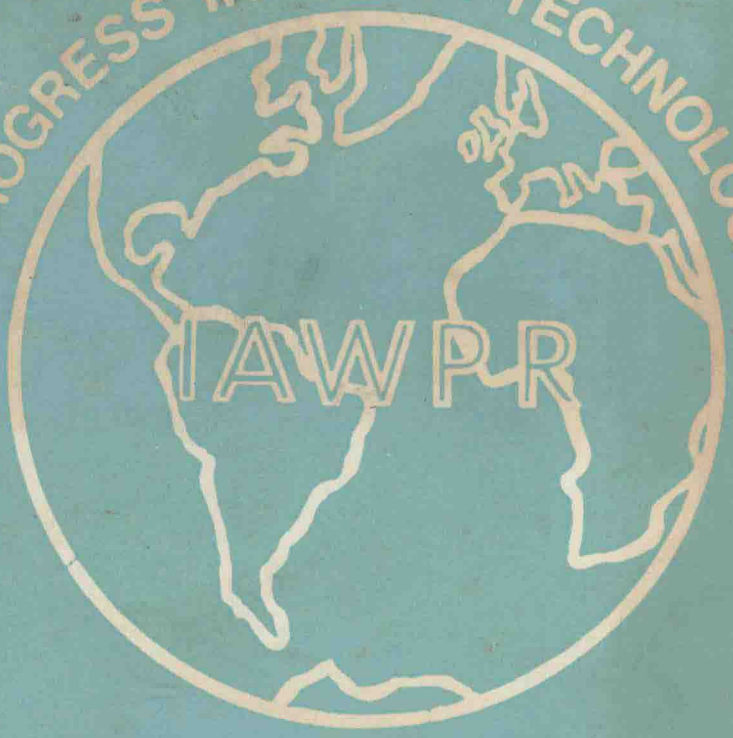
PROGRESS IN WATER TECHNOLOGY



VOLUME 6

PROGRESS IN WATER TECHNOLOGY

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INSTRUMENTATION CONTROL AND AUTOMATION FOR WASTE-WATER TREATMENT SYSTEMS

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OPENING ADDRESS

RT. HON. ELDON GRIFFITHS, MP

Minister of State, Department of the Environment

CERTAINLY the British delegates present today and, I hope, a number of our guests from abroad, will know that we have just completed legislation which will change the whole structure of the water industry in England and Wales.

We have attempted in this legislation to rationalize the approach to the water services, putting them on a firm footing to deal competently with the rapidly increasing demands for water as we go into the 1980s and 1990s. We are only too well aware that the amount of water made available to us by Nature does not increase, and that it is up to us to conserve, protect, and re-use the resources we have.

Our reorganization has been radical. On 1 April next year twenty-nine river authorities, about 200 local authority or joint water supply undertakings, and about 1300 local authority or joint sewage authorities will cease to exist. All their powers and their property will be made over to nine newly constituted all-purpose water authorities in England and in Wales, a single Water Development Authority. These new regional water authorities will become responsible for the entire water cycle—for development, management and control of rivers and aquifers, and all uses of water associated with them: for public water supplies; for sewerage and sewage disposal; for fisheries; for land drainage; and for important new functions in relation to recreation and amenity. In this new context waste-water treatment becomes, of course, an integral part of the conservation of water.

In addition to the new regional authorities we are setting up a number of new bodies at national level. At the centre there is the National Water Council which will complement the arrangements at regional level. Its membership will comprise the chairmen of the new authorities and additional members appointed by Ministers. Generally, speaking, the functions of this body will not be executive—the regional water authorities will be very largely self-sufficient. Rather the National Council will provide a forum for collecting general questions of national water strategy; it will also have important central functions for the organization of training within the water industry and the standardization of fittings and devices. The Council will co-ordinate the industry's views, and provide the Government with its main source of advice on national water policy.

To advise the Secretary of State, the National Water Council and the water authorities on specific issues there will be other new organizations to look after planning, research, statistics and recreation and amenity.

Research and Development is certainly a vital ingredient of our new policy. At present we suffer from too much fragmentation and overlapping of effort in this field; we therefore aim to rationalize and pool these resources into a new Water Research Centre. By the nature of its make-up this Centre will become a powerful source of impetus for research and development in the water industry for the whole of the United Kingdom. When it begins work it will take over a running programme with an annual value of £3–3.5 million. Within a short time we envisage this figure to rise well beyond £4 million as the Centre concerns itself with the ever-more vital problems associated with pollution and the re-use of water.

So much for the machinery. To make it work there needs to be further sound legislation to help reverse the tide of pollution. We have made some progress in containing pollution in Britain. The River Pollution Surveys of my Department clearly show that our rivers are getting substantially cleaner. Take, for example, the tidal Thames, a river into which the wastes from around 10 million people and every kind of industry are discharged in large quantities each day. In the middle 1950s, the middle tidal reaches of the Thames were a dead river. Fish could not live there and during the summer at low water, the river could, and often did, stink. Today fish are returning to the river Thames. Fifty different species have been observed passing through the Port of London. GLC officials have actually hooked fish from County Hall, Westminster, and in January 1972, a 3½-lb, 20-inch trout was caught in the intake at Fulham Power Station!

But although our existing legislation is good it is getting a little old now, it needs rejuvenation. We have, therefore, undertaken to introduce, during the present Parliament, new and significantly strengthened legislation for the protection of the environment; and an important part of this will deal with water pollution.

The Government is proposing to include the following in the forthcoming Protection of the Environment Bill to help in the improvement of our rivers:

(a) bring under control all discharges to tidal stretches of rivers, estuaries and the sea;
(b) control all discharges of trade effluents into public sewers;
(c) stop sewage being discharged from boats into fresh water;
(d) require further precautions against accidental spillages of toxic matter;
(e) provide better protection of underground waters; and
(f) make available to the public much more information about discharges.

One of the most important features of these proposals will be the extension of control to all discharges to all waters within our territorial limits. These controls will permit the attachment of comprehensive conditions to each consent certificate issued. To make this new legislation work to its best advantage we will need to rely increasingly on remotely controlled and automated techniques for monitoring discharges of effluents to our rivers and coastal waters. Inevitably, pollution authorities will demand them as the quest for clean rivers leads to the imposition of more restricting and demanding controls on discharges.

But this is only half the story: you are tackling at this Workshop the issue of automation and instrumentation control inside the treatment works. We all know what this should mean in economic terms; but it must also have a very clear meaning for the environment. This new and sophisticated technology must be developed to a stage where the controls meet fully the requirements of the pollution authorities. Later this morning one of my Department's engineers will read a paper which sets out the Government's proposals for action on this subject. I urge you to heed the warnings it contains. Automation in the modern sewage works may well be the answer to many of the operational problems, and it should, and must, be used to the benefit of the environment. But we must not be overcome by the sparkle of the computer and automation: we first need reliable and advanced instrumentation. In the past the approach to this subject has been very haphazard and uncoordinated. We must now start to put things right.

There is just one more point that I should like to make before you get down to the real business of the day. I notice from the programme that later this morning a paper will be read on the Construction Industries Research and Information Association work on the optimization study of sewage treatment. I mention this not because I want to speak of its progress or achievements, but because it is a fine example of co-operation between

organizations of different complexions. The work was co-ordinated by a steering committee comprising members of CIRIA, engineers and research workers from the universities, and the Water Pollution Research Laboratory and my Department. The work was funded by contributions from eighty-eight member local authorities with contributions from the CIRIA general fund and my Department. What is important about this research is that all the organizations concerned with the particular problem under consideration—those that have to design and build the works, those that have to maintain and operate the works and those people centrally concerned with sewage treatment—were all involved in the conception and guidance of a project. There are many projects which can be explored in this co-operative spirit. Properly conceived and directed such exercises should produce a superior product indeed. We live in an age when we cannot afford to misuse time and resources: we are often in danger of committing this crime by working in vacuo. Events such as this Workshop help us to keep in touch with one another's aims and progress—let us build co-operative research and development ventures on these foundations whenever the opportunities present themselves.

RESPONSE

JOHN T. RHETT

Deputy Assistant Administrator for Water Program Operation, E.P.A., USA

IT IS indeed a pleasure to be here. Your traditional British hospitality has already enabled us to become better acquainted and enthused for the task ahead. We appreciate the efforts that you have gone to in hosting this important conference. We hope that the results will be so worthwhile that you will feel amply rewarded.

We look forward to this opportunity for participating in this joint effort to understand the current status and future needs for instrumentation and automation of waste-water treatment plants. Through our joint efforts, we have the means to ascertain and advance the state of the art in this field. I am sure that we are going to make major contributions toward this end.

All of the nations represented here will have their own interests and viewpoints on how this conference can aid them in waste-water treatment. We of the US have our own needs for making this conference a success. We are sure they dovetail with the needs of the other nations that are here. In the case of the US, our nation is embarked on an expensive, total effort to eliminate water pollution. Even small advances in improving the efficiency and effectiveness of sewage-treatment system through automation and instrumentation will cause major savings overall; significant advances will reduce the load on our taxpayers who must pay for the improvements, and save our manpower for other important tasks.

Specifically, we hope that this joint effort can point the way to major achievements in five specific areas through automation and instrumentation:

First, we need automation and improved instrumentation to meet the new stringent requirements for waste-water treatment that are contained in the new water-pollution control legislation of the US.

Second, the energy and resource utilization crises compel us to make the most efficient use possible of our human and material resources that are involved in waste-water treatment. Mechanization and improved controls can significantly aid this process.

Third, information data bases need to be fostered that can be used for operating plants, providing input into computers, optimizing management of sewage treatment systems, and improving State and national knowledge of plant operations.

Fourth, improved coordination of sewage-treatment systems on a Regional and Basin-wide basis through cybernetics must be developed so that system-wide effectiveness in pollution control and costs can be achieved.

Fifth, participation with other nations and international organizations in achieving mutual goals and standards for waste-water treatment through instrumentation and mechanization needs to be stimulated for the mutual benefit of all.

As the countries represented at this conference all have interests that are related to these objectives, I look forward to joint efforts that will be beneficial to all.

As background for the need for major advances in the development and utilization of instrumentation and automation in sewage treatment plants, I would like to mention how

these needs related to current US programs and objectives in pollution abatement.

Our charter is the legislation entitled "The Federal Water Pollution Control Act Amendments of 1972". This legislation covers a wide range of activities, including control of industrial discharges of pollutants, Federal enforcement provisions, research and development, Federal assistance for municipal projects, and restrictions on discharging oil and hazardous materials. However, the objective and goals of the Act are expressed in the very first paragraphs.

The stated objective of the Act is to restore and maintain the chemical, physical and biological integrity of the nation's waters with the following implementing goals:

First, by 1985, elimination of discharges of pollutants into navigable waters.

Second, by 1983, the attainment of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the waters.

Third, prohibition of the discharge of toxic pollutants in toxic amounts.

Fourth, Federal financial assistance for the construction of publicly owned waste-treatment works.

Fifth, fostering of areawide waste-treatment management planning processes.

Sixth, maintaining a major research and demonstration effort to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the ocean.

These objectives and goals are buttressed by the appropriation of many billions of dollars to see them achieved. To attain these objectives and goals, our law establishes a pattern for action consisting of permits, effluent limitations, pretreatment of industrial wastes, and user charges. In all of these, improved and increased instrumentation and automation is necessary.

CONCLUSION

In conclusion, I offer this conference the opportunity to use technology to overcome the pollution which has been largely caused by the application of technology in our highly industrialized societies. The very growth of our metropolitan areas has been made possible by the application of new methods and new inventions that were unknown when we were a smaller nation. However, problems of waste disposal and other forms of pollution have resulted from these great advances in technology. Now, we have come to the point where we have to use technology to eliminate the detrimental effects of technological progress.

This conference can play an essential role in bring about the necessary technological solutions. I hope that we will all rise to the challenge.

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Instrumentation, Automation and Control for Waste-water Treatment Systems

Chairman: JOHN FINCH, UK. *Assisted by* R. W. BEST, UK

SESSION I

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