

# PREFACE:

## SYMPOSIUM ON REACTOR CONTAINMENT SPRAY SYSTEM TECHNOLOGY

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Pressurized water reactors (PWR's) have containment building spray systems installed as an engineered safety feature. The system can serve a dual purpose, it can act as a pressure and temperature reduction device and it can also be used as a fission product removal system in the environment postulated for a PWR loss-of-coolant accident. A large number of current generation PWR plants are planning for the fission product removal capabilities of sprays to provide the reduction in the calculated two-hour thyroid dose necessary for site acceptance.

Containment spray systems offer several distinct advantages over other fission product removal systems in both cost and reliability. The removal of elemental iodine, the major contributor to the thyroid dose, is very rapid and can be made quite irreversible by the addition of chemicals to the spray solution. Organic iodine removal by sprays is slow, but particulate removal appears to be much better than original estimates had predicted. The cost of the spray system is significantly less than that of other fission product removal systems.

A coordinated research effort was started in 1967 to provide the information required to substantiate the iodine removal capabilities of sprays in this type of nuclear plant application. The program has involved AEC-sponsored research

as well as that of the nuclear industry. The AEC-sponsored program has involved facilities at Oak Ridge National Laboratory, Battelle-Pacific Northwest Laboratory, and Idaho Nuclear Corporation. The research has covered a solution additive search, corrosion studies, investigation into the radiation and thermal stability of solutions, protective coatings tests, and large-scale containment spray experiments.

The results of the major part of this investigation were presented at the Symposium on Reactor Containment Spray System Technology held at the 1970 Annual Meeting of the American Nuclear Society in Los Angeles, June 29 through July 2, 1970. The Symposium consisted of two special sessions with a total of 17 papers. In addition to the United States papers, including research sponsored by both AEC and private industry, the sessions included one paper from each of the Italian, Japanese, and Swedish spray research programs. These countries have groups actively engaged in research related to the application of spray systems as a plant safety feature.

We feel that the papers present a good picture of the status of spray system technology. Our appraisal of the situation is that the major questions have been answered and those remaining will be resolved within the scope of the continuing research planned.