as the "Requirements Merry-Go-Round." [4] [5] In many respects desalting falls into this category.

Too often during the past have we heard that there was little or no immediate requirement in the United States for desalting and that when the needs materialize then technology can be developed to handle the situation. It is of interest that these are almost the same thoughts that were expressed some two decades ago in connection with the development of nuclear energy. I would strongly suggest that the Federal desalting program be oriented to a set of clearly defined objectives rather than requirements, and that each of the processes developed by application oriented at the earliest practical time. The lead time for water resource planning in most cases will require the early demonstration in a water supply environment if desalting is to be considered a valid alternative.

The AEC's desalting program has been primarily directed at adapting the reactor technology developed under the civilian power program for central station plants to large dual-purpose power and water plants. The principal technical problems are related to the coupling of two new technologies (nuclear power and desalting) together in a single plant. But, the management problems of large-scale dual-purpose plants both at the power and water utility level as well as the government level may be equally troublesome. This has already been referred to. I commented on this particular problem in my remarks at the nuclear desalination symposium in Madrid, Spain on November 18, 1968.[6] My remarks drew from the experiences gained from the Bolsa Island project and pointed to the need in project management for a lead organization with sufficient authority to provide sound and coordinated direction for the design, construction and operation of large nuclear desalting projects.

In undertaking any large project based on advanced technology, a systems approach is almost certainly a prerequisite to its success. We are pleased to note that the report on a proposed Federal desalting program which was recently submitted to this committee by the Office of Science and Technology, supports this position and notes that "A systems approach will be needed to achieve the maximum economies for any large-scale plant developments, taking into account the interaction of the desalting plant with its energy source as well as with the systems into which it will be introduced."

At the Government management level, I believe greater emphasis could be given to the use of the joint office concept between Interior and AEC for the direction of the development effort for large-scale nuclear desalting, particularly for any project oriented activities. This approach probably provides one of the better means for coordinating a major program in which more than one agency is involved. While our experience with joint offices has been varied, we have had good success with such arrangements with the Navy under Admiral Rick-

[4] James T. Ramey, "The Requirements Merry-Go-Round: Must Need Preceed Development?," *Bulletin of the Atomic Scientists*, November 1964.

[5] James T. Ramey, "The Requirements Merry-Go-Round, Phase II," remarks before Atomic Industrial Forum, San Francisco, California, December 2, 1964 (AEC Press Release IN–543).

[6] James T. Ramey, "Practical Considerations in Desalting and Energy Development and Utilization," remarks before Symposium on Nuclear Desalination, Madrid, Spain, November 18, 1968. (AEC Press Release S–51–68).