



conference report

The rallying call of this Conference, with its extraordinary drawing-together of engineering talent, seems almost trite to repeat in the wake of the press coverage the meeting received. Yet the message can hardly be overemphasized: the world, and for ASME especially the United States, is voraciously consuming its fossil fuels. It needs a viable substitute for them very soon to fuel stationary electrical generating plants. Nuclear energy sources offer the only possible long-range solution, and it is incumbent upon the engineering community not only to develop economical, safe systems, but to assure the consuming public of their safety. The components of nuclear power systems germane to this Conference were the pressure vessel and its piping, but not to be forgotten was the safety of piping used for transporting pumpable fossil fuels, so long as these last.

If there were any of the engineering community present who doubted the aptness of the word *crisis*, the Plenary Session¹ of the Conference should have made believers of them. Dr. Seymour Baron put it this way—that it is indeed a crisis, not so much for lack of engineering solutions but because (almost) nothing is being done about it. Dr. Baron extrapolated demand for electrical power from past experience of a two-fold increase every ten years, slightly less than Florida Power and Light's President Marshall MacDonald reported for his Company between 1950 and 1970. With this rate, a "spigot-dry" crisis for natural gas looms in about ten years, oil in twenty-five, and for coal in sixty to seventy years if it is used to replace the other energy sources. But even the exploitation of coal-derived energy for three generations presents some major problems, even though sufficient quantities are present in the North American crust. Some 22,000 acres (8900 hectares) of land must be despoiled, largely for mining operations to support one 1000 MW

¹The Plenary Session, entitled "The Energy Crisis—Some Questions and Answers," comprised the following presentations.

- 1 "Florida's Energy Needs—and Energy Options," by M. McDonald.
- 2 "Liquid Metal Fast Breeder Reactor—The Answer to U. S. Industrial Survival," by S. Baron.
- 3 "The Role of the Engineering Societies in Obtaining Public Acceptance of Power Plants," by B. F. Langer.
- 4 "Nuclear Pressure Vessels and Piping Materials: Where to Next?," by W. E. Cooper.
- 5 "Challenges and Methods of Fracture Control," by H. T. Corten.

plant for one year, and oil shale recovery is estimated as six times as bad. One thousand such coal-fuelled power plants—no way!

The long range alternative—if indeed it is not the only feasible way—is the uranium-fuelled Liquid Metal Fast Breeder cycle. For the present, the uranium-fuelled boiling water reactor (BWR) and light water reactor (LWR) are of a known technology. To paraphrase Bernie Langer, it is high time that we got on with it—it is irresponsible of the public weal, even of its safety, to advocate a moratorium on nuclear power plant construction.

How then can the engineering community assure the public that the new systems are really safe? Dr. William Cooper, in his presentation, advocated voluntary regulation by standards groups working under the auspices of existing technical societies, such as ASME. Government regulatory agencies fail for lack of direct, painful, involvement—a genuine conflict of interest in whose intensity Langer saw some correlation with level of competence. Be that as it may (as a government employee I tend to have a different viewpoint), clearly the time for action is now.

The Conference as a whole was concerned with presentations of technical papers on problems bearing on the safety of pipes and vessels. Most feared of possible failures are those due to fracturing. Hence it was appropriate that the Plenary Session concluded with an introduction to the subject of fracture control plans, aptly presented by Professor Herb Corten.

In addition to the Plenary Session and tutorial courses on the ASME Boiler and Pressure Vessel Code, some thirty-six technical sessions were presented. This issue of *JEMT* collects those papers assembled by Dr. Kent Shoemaker for the four sessions sponsored by the Materials Division and recommended for publication in *ASME Transactions*. Two of the sessions treated phenomena of fracturing: fatigue, corrosion-fatigue, sustained load cracking. The other two dealt with fracture-induced failures in piping and pressure vessel systems. The writer's involvement with the ASME review process, which ordeal has been survived by all these papers, leads him to recommend at least your perusal of them.

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