

consumers for construction costs as they accrue, before the plant is in operation — is short-sighted and will benefit nobody.

Commercial utilities in the United States are subject to strict state regulation; in most states, the time-honoured principle of charging customers only for plant equipment that is "used and useful" is the rule. The utilities argue that the rule is outmoded. When nuclear plants used to cost a few hundred dollars per kilowatt and when interest rates were a few per cent a year, the addition of a new plant barely caused a ripple. Indeed, the savings in fuel costs would often outweigh the capital costs of a new nuclear plant, resulting in a decline in the price to customers. But costs have now reached staggering heights. A new nuclear plant, with a typical capacity of 1,000 megawatts, costs more than \$2,000 million, ten times as much as in the 1960s. High interest rates and construction delays add to the cost eventually charged to the consumer — whence the 30 per cent increases. The utilities want the right to charge consumers as they go. This "Construction Work in Progress" charge (CWIP) would be used to pay the dividends due to bond and stockholders during the period of construction. It would also result in a gradual phase-in of the price increase. Without CWIP, the utilities say, they have to borrow money to pay the bonds that become due during construction, and the extra cost of borrowing is ultimately passed on to the consumer once operation begins.

The utilities seem to have overlooked the principle on which the regulation of their charges is based — that present consumers should pay only for the services available to them now and not for services that will be available only to future cohorts of consumers. That principle, which underlies the regulation of all rates charged by public services in the United States, could not be overturned just like that to suit the present convenience of the electricity utilities. Moreover, to change the rules arbitrarily would be inequitable in quite tangible ways. For while it is true that by "paying now", a consumer would avoid having to pay for the interest charges accumulating during a construction project, he would then be denied the opportunity of investing the extra payments on his own account. "Pay now" costs at least as much as "pay later".

Although "pay now" seems to solve the utilities' immediate problems (not the least of which is the public relations problem of asking for 60 per cent increases), it glosses over a more fundamental difficulty. According to Professor Michael J. Driscoll of Massachusetts Institute of Technology, "the real solution is not to play around with CWIP, it's to get back to a reasonable construction schedule". Building nuclear plants used to take six years from start to finish; in France, they still do. But in the United States they now take 10 to 12 years. And the utilities' scapegoat — government delays in issuing licences — is only partly to blame. Driscoll points to inefficient management and the practice of custom-building each new reactor. France has seen the wisdom of that American innovation, mass production. But every delay increases the interest costs accumulated during construction, and the utilities would gain more by solving this underlying problem than by covering it up with CWIP charges.

Bluntly the burden of paying a 30 per cent or 60 per cent increase in prices is less for society as a whole than paying ahead of time for a nuclear plant that is not needed. The present system has the virtue of forcing the utilities to persuade bankers and investors that future demands will justify the next 1,000 megawatt power plant. The "pay now" policy, on the other hand, allows the utility to pass off some of the risk of its venture onto its consumers. And the track record of the industry in predicting future demand suggests that the consumers would be forced to make some bad investments. The industry has been notoriously optimistic — in 1974, the Edison Electric Institute (the commercial utilities' trade group) predicted a total US energy demand of 160 quads by the year 2000. By 1976, it was 140. In 1980, Exxon Corporation was saying 105. With the demand for electricity at a near standstill (rising only 0.3 per cent in 1981, in contrast with 7 per cent per year throughout the 1960s and early 1970s), the need for cautious planning is obvious. The marketplace should be allowed to continue to exercise a check on new power plant construction.

## Press's forgotten recipe

*Does the US scientific community consider Dr Frank Press's cure unpalatable?*

Strange as it may seem, people have been ignoring Dr Frank Press, president of the US National Academy of Sciences. Press has had the temerity in the past six months to propose a long-term cure for the ills of US science. He has been observing that in these unprecedented times, federal funding on science has become part of the vulnerable discretionary federal budget and thus vicariously liable to cuts. What has happened this year, with the executive branch and Congress still haggling over money for the year that begins on 1 October, may be symptomatic of what is to come. So, Press says, the science community should negotiate a pact with government and industry to insulate science, to stabilize funding and to ensure that talented young scientists have opportunities.

In Press's five-point plan, government would agree to assured increases each year in the budget for basic research at a rate that would cover inflation and allow an extra 2 per cent of real growth. This "base programme" would be government policy. It would not rule out larger increases, but would ensure that overall funds did not fall below this level. Government should commit a further 1 per cent each year to "targets of opportunity", for research related to national needs or for new facilities. At the same time, industry would agree to double its present total contribution of \$50 million and would also start, with the government, a new fellowship programme. A central agency, perhaps the National Academy of Sciences, might serve as a collection and distribution agent, although the funds would be spent in fields where shortages are likely and selection could rest with individual agencies. A comparatively small amount of money, say \$10 million, would buy a thousand fellowships.

The nub is in the last of Press's five points. Scientists themselves, he says, should be able to find another 2 per cent by setting priorities within their own fields and by cutting out unproductive work. Then, the argument goes, universities could persuade government to ease regulations, such as the notorious Office of Management and Budget regulation on accountability, and let them keep the savings. Based on the estimated \$7,000 million the government spends on basic science and engineering, Press's potential cure could provide an extra \$694 million, an increase of almost 10 per cent, plus the use of up to \$114 million in funds that have been reprogrammed. But where should the extra money come from? Press suggests that the government should raid the development budget where, he believes, there is a lot of waste. (The Clinch River breeder reactor programme consumes about \$600 million each year, development of the B-1 bomber about \$700 million a year.)

The weakness of the plan is Press's assumption that scientists will centralize their lobbying efforts in Washington upon the single cause of a guaranteed overall increase. (Another is that Congress is all too familiar with special groups seeking to convert appropriations into entitlements.) Success for the plan would, however, bring predictability to the support of basic research and put scientists to work setting their own priorities, not leaving that to officials in Washington. And, of course, nothing in what Press has been saying suggests that the government has at this stage agreed that the scientific community could keep whatever savings would accrue from a more rational pattern of expenditure.

So why has the scientific community neglected the challenge? In the peer-ridden US system, changing tack in any direction is difficult. Arrogant specialization does not help. But Press's message is that if the research community cannot decide priorities for itself, the accountants and the lawyers will. Press seems to be echoing what Dr George Keyworth has been saying from the Old Executive Office Building next to the White House, but he has stronger credentials for being taken seriously. Indeed, with his experience of an earlier White House, Press is uniquely well placed to make what he has been saying tell. Why does nobody respond or even listen?