



Control room in the TMI plant: Carter says utilities must modernize, standardize and simplify reactor-control panels for effective crisis management.

NRC was in effect a "headless" agency. During the accident, no one person was in charge, the Kemeny commissioners complained, adding that NRC's attempt to manage the accident "by committee" also proved unworkable. Although NRC did have an official whose duty was to command day-to-day operations, the official has since resigned (only days after release of the Kemeny report) following more than a year of internal inquiries regarding his performance. It appears that rather than strengthening this role, Carter will elevate responsibility for operations control to the agency's chairman.

To expedite the data collection and analysis necessary to transfer lessons learned from the accident into improved federal regulation of safety and accident management, the President is submitting a supplemental appropriation to Congress, including \$49.2 million in additional money for NRC and \$7 million for DOE. Carter said fiscal-year 1981 budget proposals, which he will send to Congress next month, will further fatten the budget for nuclear-safety programs.

"But responsibility to make nuclear power safer does not stop with the federal government," Carter said. Nuclear utilities must undertake safety-improvement programs "and demonstrate a commitment to safety that goes beyond mere compliance with regulation." Among the President's recommendations: Develop a concept of personal responsibility by making a com-

petent and well-trained decision-maker at the plant site responsible at the corporate level for safety. Carter also said it is the utility's responsibility to see that control-room operators are better trained. But even well trained plant operators cannot be expected to act effectively, the President added, unless utilities modernize, standardize and simplify control-room panels. Under normal operations more than 50 warning alarms could trip; during the TMI accident, more than 100 did.

NRC has already been directed to evaluate and accredit industry safety reforms including operator training. And within four months it must brief the newly created nuclear-oversight panel on the progress made toward improving operator- and supervisor-qualifications criteria; expanding use of reactor simulators in training; testing and recertifying licensed plant operators; and accrediting training schools.

NRC recently enacted a self-imposed ban on licensing the construction or the operation of new plants while it analyzes lessons gleaned during its investigation of the Three Mile Island accident. Carter said last week that although he endorses the licensing moratorium, NRC had better not let it drag on more than an additional six months. Citing recent events in Iran, he said every domestic energy source, including nuclear power, must be harnessed to decrease the U.S. dependence on imported oil. □

Study pinpoints stress-illness link

To many, the notion that emotions can affect physical health, and vice versa, is little more than common sense. Most researchers, however, take nothing for granted until it is proved through scientific inquiry. Numerous studies have demonstrated links between psychological stress and physical illness (SN: 12/10/77, p. 394). But a consistent problem in this area is the paucity of *prospective* research — studies that trace the characteristics of an initially healthy population over time, rather than waiting for illness to strike and then trying to pinpoint the historical causes. Such predictive methods hold an

advantage, scientists believe, because the researcher is not prejudiced by searching for contributors to an illness he or she knows has already occurred.

Perhaps the most significant prospective study on the interaction between mental and physical health has been published in the Dec. 6 *NEW ENGLAND JOURNAL OF MEDICINE*. From an original sample of 204 men in the sophomore classes of 1942 to 1944 at Harvard University, 185 have been followed more than four decades. Over the years the men have received a wide range of psychological and physical tests and interviews, as well as

annual or biennial questionnaires. The psychological "predictors" in the tests included factors such as visits to a psychiatrist, little occupational progress, job dissatisfaction, unhappy marriage, little recreation or vacation time and poor psychological "soundness."

The results, reported by Harvard psychiatrist George E. Vaillant, appear to confirm not only that a mind-body health link exists, but that even physically healthy persons who react poorly to stress or have chronic mental health problems run a significantly higher risk than most people of developing serious health problems or dying by the time they reach their fifties. "Of 59 men with the best mental health, assessed from the age of 21 to 46 years, only two became chronically ill or died by the age of 53," Vaillant reports in the journal. "Of the 48 men with the worst mental health from the age of 21 to 46, 18 became chronically ill or died."

The results were "statistically significant" after Vaillant and his colleagues eliminated the possible effects of alcohol and tobacco use, obesity and the lifespan of the subjects' ancestors — indicating even more strongly that mental health deficiencies are causative factors in illness. Between 1940 and 1967, the terms used to describe poor adult adjustment were attributed "at least twice as frequently" to men who became chronically ill or died in 1975.

In what Vaillant cautions are "tentative conclusions," he says that "in this sample chronic anxiety, depression and emotional maladjustment, measured in a variety of ways, predicted early aging, defined by irreversible deterioration of health. ... The data suggest that positive mental health significantly retards irreversible midlife decline in physical health."

In an editorial in the same issue of the *NEW ENGLAND JOURNAL OF MEDICINE*, Leon Eisenberg of Children's Hospital Medical Center in Boston says that despite problems inherent in studies of such nature and scope, the correlations between scores on the mental health scales used in the Harvard research and "other indicators of psychopathology (defense structure, depression and psychiatric diagnosis) lend support to its credibility. ... There is a growing body of evidence that life stress predicts increased psychiatric and physical morbidity, and that social ties mitigate the pathologic effects of stress." A previous study in Alameda County, Calif., for instance, reported that men and women with few social ties run more than double the risk of death, compared with persons with many ties.

Eisenberg and Vaillant concur that such findings hold implications for possible preventive treatment, as well as future studies. "On the basis of this study and previous work," Vaillant says, "I have speculated that stress does not kill us so much as ingenious adaptation to stress ... facilitates our survival." □