a failure of control and operations rather than of planning and design.

Neither the state nor the city investigation found a "single most important" cause; they cite a number of factors including operator error, mechanical failure, poor planning and design, and shoddy maintenance and testing. In some cases the reports contradict each other, with one exonerating Con Ed for practices another condemns.

The state report, prepared by Norman M. Clapp, former chairman of the Wisconsin Public Service Commission, finds that cost-cutting compromises weakened the design of the system—as when Con Ed in 1972 chose the cheapest of six alternatives for increasing its ties to other utilities; any of the other five, Clapp says, would have averted the blackout. Clapp also chides Con Ed for "unwarranted complacency" in leaving equipment out of service for long periods. A tie between New York and New Jersey, for example, was down for months while Con Ed dawdled about getting a major replacement part; Clapp believes it would have prevented the blackout if it were available. That assertion is challenged by the federal report.

The city's report, issued by a special commission appointed by former Mayor Beame, was the most prosecutory in tone; it still turns Con Ed managers apoplectic. Although the report contains several assertions that do not jibe with other findings, the city's inquiry played a key role in spotlighting the confusion in Con Ed's control room.

All three reports put the ultimate responsibility on management for failing to train employees for emergencies, ensure that equipment was in good operating condition, and otherwise guarantee the reliability of the system. The state report suggests that "serious financial constraints" led Con Ed to cut too many corners. The city report argues that the rate structure for utilities provides no incentive for reliable service.

Con Ed has steadfastly asserted that its system met all applicable design criteria, but that claim is based, according to the state and federal reports, on a strained interpretation of the criteria. Con Ed was required to design its system to cope with the simultaneous loss of two "adjacent" circuits as a "single contingency." But the 345-kilovolt lines that succumbed to the first lightning stroke were not, strictly speaking, adjacent. They were carried on the outside of the same towers but were separated by smaller lines between. So Con Ed did not, in fact, design for their simultaneous loss.

Con Ed also asserts that, however disappointing its efforts to call up reserve generation were, it at least met its minimum 10-minute operating reserve as required by the New York Power Pool. But that assertion, according to the state report, is "beside the point." The pool's reserve requirements are aimed at coping with potential generating losses, not with the loss of transmission lines. Indeed, the criterion assumes that there will be enough lines available to transfer reserve power to the utility that needs it. There was ample reserve capacity in the pool the night of the blackout—it simply could not be delivered to Con Ed. Neither Con Ed nor the pool had thought through the problems that transmission losses could cause.

What should be done to prevent a recurrence? Con Ed has already initiated a new storm watch procedure. When a thunderstorm is forecast, it beefs up generating units and personnel to handle the possible loss of major transmission lines to lightning. The utility has also added another senior person to its control room to ease the strain of coping with emergencies. And it has returned downed equipment to service, accelerated construction of a new underground cable to New Jersey, intensified its training programs, provided all its gas turbines with remote-start capabilities for emergencies, started to reinforce its most vulnerable overhead lines, and taken dozens of other corrective measures. These should, according to the federal report, "substantially reduce" the likelihood of another blackout. But the state and city reports call for more radical reforms, including economic sanctions against Con Ed's stockholders for unreliable performance, the addition of public members to Con Ed's board, and a new corporation to operate transmission lines in the state. The State Public Service Commission has deferred making a decision on some of the most costly recommendations.

On 26 September, just 75 days after the blackout, the Con Ed system was subjected to another emergency even more serious than that of 13 July. Six lightning bolts hit transmission circuits and knocked four of them out of service for substantial periods. Again, automatic reclosing devices failed to perform, so various protective devices shut down 40 percent of Con Ed's generation. But personnel responded more alertly this time and shed enough load to cope with the crisis. This episode can be read as a vindication of Con Ed's improvements—or as evidence that defects continue to threaten the system. It seems clear that the utility's managers have armed themselves to cope with the events that caused the last blackout. But will they be able to head off the next?

—PHILIP M. BOFFEY

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Carter Reorganization Panel Says Federal Data Processing Is Lagging

The U.S. government gave the early impetus through its military and space agencies which built the American lead in computers and then became the biggest customer for data processing equipment in the world. It is rather ironical, therefore, that the federal government for more than a decade has been a butt of criticism for the way that it buys, manages, and uses computers and associated technology.

Over the years, this criticism has shown up in congressional complaints, blue-ribbon panel studies for the Executive Branch, and a long series of hectoring General Accounting Office reports. The most recent and perhaps definitive word on the subject comes from the Carter Administration's government reorganization effort, specifically from a group commissioned to look not at a particular agency, but rather at the government's ubiquitous data processing subculture.

The Federal Data Processing Reorganization Project, as it is called, was primarily concerned with management

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problems, and its criticisms are made in generalized form intended for the initiated. One theme that runs through the reports of the ten project team* is that federal executives persist in regarding data processing as a glorified bookkeeping aid and fail to integrate it effectively into the operations of their agencies. A concrete example cited by the human resources team was the long delays in processing claims for benefits under the new federal black lung disease legislation. Processing was essentially handled manually, when use of information technology would have meant better service at lower cost.

Cause for Alarm

Some of the examples in the report give genuine cause for alarm. The national security team cites instances where equipment vital to combat and command operations was vulnerable in an emergency because it lacked elementary adjuncts such as backup power sources.

A major matter of concern in the team reports is what might be called technology lag. According to project estimates, the government is at least 6 years behind U.S. high-technology industry in its utilization of data processing and even further behind current state-of-the-art technology. The gap appears to be widening. Last year about 68 percent of the data processing equipment inventory in the Department of Defense was obsolete in the sense that the equipment was no longer in production. The figure for private industry was 35 percent. The trend is indicated by the fact that the figure for DOD in 1970 was only about 35 percent and a DOD blue ribbon panel was concerned about the obsolescence factor then. In the world of computers the economic life of a computer is put at about 5 to 7 years and a manager who thinks he is saving money by keeping an old machine running is likely to be doing exactly the reverse through high maintenance and running costs and the "obsolescence" of personnel.

The project generally confirmed earlier critics' views that the government is doing much less than it might in utilizing the new technology to cut costs, improve services, protect privacy, and enhance national security. In taking their comprehensive look at the system, incidentally, the group has traded the term data processing in for the broader "information technology." Noting the marriage of computers with sophisticated communications systems and the incorporation of computers in weapons and other sophisticated electronics based systems, they say that "data processing" is so limited as to be misleading.

On of the reorganization teams was headed by Alton P. "Pete" Jensen of the computer science department at Georgia Tech. Jensen not only has a Georgia connection, but also headed the data processing component of Jimmy Carter's reorganization of the Georgia state government when he was governor. Jensen was invited to join the federal project by friends in the Carter Administration. He is taking the central role in fashioning a summary report, now nearing final draft stage.

Jensen and others felt that significant private sector participation in the project was important and were successful in getting it. Roughly 40 percent of those active in the project were from outside government. Not only did the outsiders bring different expertise and perspective to the task, but they probably influenced the ground rules. The overall reorganization effort is being carried on under the aegis of the Office of Management and Budget. Private sector members of the project argued that OMB was unacceptable as an overseer of the study because the Executive Office agency plays a main role in the system of centralized management prescribed for information technology and was, therefore, so to speak, part of the problem.

OMB officials acceded to a request that the report simply be forwarded to the White House and not be edited by OMB, and have apparently stuck to their commitment. Although there have been some disappointments along the way—project teams in general did not have access to Cabinet-level officials—cooperation from the agencies involved has been said to have been good.

The separate teams reached their own conclusions and made their own recommendations, which in some cases differed and even conflicted with the recommendations of their colleagues on other teams. Both project insiders and interested outsiders say that the study was an unusually open one, with vigorous debate encouraged. The debate seems to be continuing as Jensen works on the summary report whose recommendations are meant to represent a synthesis of differing perspectives. Jensen says that on most of the important points the group is close to consensus and that he expects a final draft soon.

Although there may be differences over the recommendations, there is little disagreement on the troubles with federal information technology. Perhaps surprisingly, the main problem seen with information technology is that, in a nutshell, it is overcontrolled. Technology has moved so fast that government has not been able to adapt its attitudes and rules fast enough to keep up. The main difficulties are not with basic policies but rather with the often restrictive way these policies are implemented.

Basic federal policy on automatic data processing (ADP) management was shaped in the early 1960's. When it became evident that information processing was becoming an important and expensive tool of government, Congress undertook to impose ground rules on its growth, with the leading role taken by Representative Jack Brooks (D–Texas), then chairman of a Government Operations Committee subcommittee. There was a strong feeling on Capitol Hill in those days that individual federal agencies were plunging into computer acquisition, giving little thought to getting the best technology for their purposes or the best price. Some agencies grossly underused their ADP equipment and others leased equipment to avoid high purchase costs when buying hardware would have been more economical in the long run.

Brooks sponsored legislation aimed at establishing authority and procedures that would promote efficient use of data processing equipment in government. The pivotal responsibility for ADP operations was given to the General Services Administration (GSA), drastically diminishing local option in the individual agencies. GSA, for example, was given the authority to establish pools of ADP equipment for use by several agencies and to transfer equipment among agencies.

The system which emerged and still prevails is one in which GSA writes and administers regulations for procurement and use of ADP equipment, OMB is responsible for setting general policy, and the National Bureau of Standards is expected to provide hardware and software standards for the agencies. The "Brooks act" remains the key legislation in the field and Brooks, who is still in Congress and now chairman of the Government Operations Committee, continues to be the dominant Hill figure.

The GSA-OMB-NBS troika has drawn

*The project was carried out by some 55 professionals drawn from government and the private sector—both industry and academe. The group was divided into ten teams, five of which dealt with agencies clustered by function or type. These were general government, human resources, national security, science and technology, and small agencies. Five other teams focused on management issues which cut across agency lines—these were the acquisition, operational management, personnel, standards, and central agencies teams. The central agencies were those charged with major responsibility for the setting of policy on data processing and its implementation.

criticism over the years, including a going-over in a committee report† after hearings called by Brooks in 1976, and was found wanting by the central agencies team of the reorganization project. The general theme has been that GSA has been deficient in enforcing regulations and providing adequate guidance to user agencies. OMB is faulted for writing weak and confusing policy statements and also for expecting GSA to implement these policies, but not backing up GSA in confrontations with major user agencies such as the Department of Defense.

The concentration of responsibility in GSA by the Brooks act gave Congress, and particularly the House Government Operations Committee, which has jurisdiction over GSA, a convenient target for working out dissatisfaction with the ADP management. Concentrating on the procurement process, a sitting duck generally for congressional oversight efforts, Congress has intervened vigorously in an effort to force better management practices. The acquisition team records some 30 "holds" on procurements in the past 2 years.

Brooks has long been identified as a strong partisan of competition in ADP procurement and was sharply critical 2 years ago at the rise of noncompetitive or sole-source procurements revealed at the hearings. Intervention by his committee in the procurement process is sometimes interpreted as a rather heavy-handed method of promoting competition. Some knowledgeable outsiders say that if the cases are looked at closely, it turns out that the committee is not objecting to the choice of a particular vendor or price, but rather is taking issue with actions by the agencies which have not been authorized by Congress or which constitute actual violations of congressional mandate. In recent years, congressional committees have been concerned by the threat to individuals' privacy posed by new technology and have intervened in agency plans to create systems which appeared to pose such threats. Intervention often comes 2 or 3 years into the procurement cycle, thus further delaying a process that can be a painfully protracted one anyway. To avoid congressional intervention, critics say that what is necessary is much better planning by the agencies and more openness in dealing with Congress.

The reorganization project study groups seem unanimous in accepting the approach of the Brooks act but takes issue with the way it is implemented. A major criticism is that the emphasis on the procurement process is excessive. Jensen and others say that oversight is a major component of management, but in ADP matters it has become the dominant management style. What is needed is a change in the managerial mindset which has resulted in the reign of "punitive oversight."

The reorganization project is not offering simple solutions to complex problems. Recommendations will be aimed not only at improving the procurement process but will include a range of measures designed to alter attitudes and actions. High-level technical knowledge is lacking in most agencies as is technical knowledge at high levels; various steps to remedy these defects will be urged. In particular, strengthening of GSA's information technology capabilities are recommended so that the agency can help smaller agencies to plan and manage ADP programs. Major agencies such as DOD are said to need a bolstering of in-house ADP capabilities. Cost-accounting on ADP operations is said to be inadequate and to need a major upgrading if decisions on data processing issues are to be made efficiently. Management responsibility in the data processing field has been diffused and it is suggested that performance would improve if it were possible to allocate praise and blame more precisely.

The project reports also point to a whole range of personnel problems which contribute to inefficiency and higher costs. These are said to be exacerbated by present policies and to need to be dealt with systematically.

The project's summary report is intended to be a consensus document, and a few points have been the cause of lively controversy. Recommendations on how choices should be made between building in-house capability or contracting for commercial data processing services are one example. Group members from the private sector tend to be more favorable to outside services than the government members. A main obstacle to reaching agreement has been the difficulty of making accurate comparisons of costs because of the elusiveness of factors such as the cost of "obsolescence" of ADP personnel and the ultimate cost of pensions and other fringe benefits for federal employees.

Another sticking point and one that is certain to attract attention will be in the recommendations on "advocacy for information technology." A major recommendation in the draft summary is for a Special Assistant to the President for Information Policy, Plans and Programs, and also a National Council for Information Technology Policy, Plans and Programs. The rationale for installing an information technology adviser in the White House is the familiar one that such an official would more easily gain the attention and support of the President and would wield more influence in dealing with federal agencies because of the presidential link. Dissenters feel that an adviser installed in the White House would be regarded simply as a special interest lobbyist and, consequently, would lack leverage. The summary report will apparently present majority and minority views on the subject, carrying the open style of the project into its final product.

What are the chances of federal information technology programs being effectively reorganized? Jensen believes that Carter has the background to appreciate the importance of the problem and to grasp the technical issues involved, and he feels that strong presidential initiative is necessary if substantial changes are to be made.

Nobody is pretending that it is easy to catch up with technological change in any sphere; in government the practical difficulties are formidable. Certainly, inertia and self-interest in the civil service are debilitating factors when change is proposed. But the full implications of some of the changes recommended will have to be examined carefully. OMB is sure to be asked to take a stronger line in making and enforcing policy. However, OMB may question how far it should go in that direction. An elite agency which still emphasizes its budget functions over management ones, OMB may well resist pressure to assume a more aggressive management role, especially because it was bitterly criticized for doing just that during the Nixon Administration. Once burned is twice shy applies in government too.

The Carter Administration deserves credit for taking on some intractable but important problems. Government reorganization certainly fits into this category. Information technology often seems a dispiritingly technocratic subject, and in terms of points on public opinion polls on presidential performance the data processing project is probably a thankless task. But to control government you must first understand it. And if the chances of working a "cure" of the problems of information technology in the federal government are problematical, the reorganization project has provided a solid diagnosis.

—JOHN WALSH

†Administration of Public Law 89-306, Procurement of ADP Resources by the Federal Government. House Report 94-1746 (Government Printing Office, Washington, D.C., 1976).