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RESPONSE TO THE ALASKAN EARTHQUAKE

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Introduction

Having been involved in a number of major disasters, I long ago concluded that although our advance preparation for disasters, including our efforts to mitigate their impact, are generally quite inadequate, we do understand how to manage the rebuilding in an effective manner. Whether we do, or do not, use this knowledge, however, depends heavily on the political environment at the time and place a disaster strikes. Alaskan reconstruction after the 1964 earthquake illustrates this most clearly. How well the scientific and engineering techniques we applied will stand the test of time, I do not know, but the speed of rebuilding, the teamwork established among an astounding number of organizations, and the attention paid to mitigation were unprecedented, and established some concepts that have been built upon and improved.

Magnitude Attracts Attention

The 8.5 Alaskan reading in the Richter scale was of tremendous interest to geologists, since this was the largest reading ever recorded in North America, even though larger earthquakes may well have occurred before this continent was populated. The physical appearance was dramatic. Some 52,000 square miles either rose or sunk by 5 feet or

more. Docks, portions of the railroad, and a number of homes were replaced by the ocean. In central Alaska, which included about two-thirds of the population, the highways and the railroad were inoperable, water and sewer systems were out of operation, portions of them pulverized beyond repair. All the small boat harbors and canneries, representing the bulk of the economy, were unusable. Property lines were shifted, and where to rebuild was often a very difficult question.

Because of the very short construction season, combined with the severe winters, the prospect for sufficient rebuilding to enable residents to remain in Alaska were dim. When I first arrived in Alaska, I found no engineers who believed it was possible to rebuild quickly enough to avoid the necessity for mass movement of Central Alaskans to the lower 48 by fall, a catastrophic blow to the young state. The economic impact on a state which at time had a very small economic base, was more severe by several orders of magnitude than that faced by any other state since the Civil War. In a desperate effort to rebuild rapidly enough to prevent outmigration and an economic disaster, it was clear that the effort would involve an unprecedented variety of federal, state and local agencies. As it turned out, every federal department, and most of the independent agencies were involved. The same was true at the state and local levels. Further, the private sector and non-profit organizations also played key roles in the successful recovery.

Need for Special Machinery

President Johnson and his top staff, particularly Harold Seidman at the Bureau of the Budget, quickly concluded that the existing federal machinery would not be adequate to harness this variety of agencies in a timely fashion, and that special organizational arrangements would have to be made. Recognizing that there would be a need for close executive/congressional cooperation, the President established a policy commission comprised of a number of Cabinet members, but headed by Senator Anderson. Although it was clear that a powerful senator could exert considerable policy leadership in such a situation, a legislator could not constitutionally exercise executive powers. Therefore President Johnson relied heavily on his department heads and also appointed me, a member of the Executive Branch, as Executive Director to act as the operational coordinator of the rebuilding effort.

As we got under way with our work, it became clear that in many ways the past approaches to dealing with disasters in the United States were simply not adequate for this one. New approaches were to be required both in the program and management areas, some of them drastic departures from past experience.

MANAGEMENT APPROACHES

Authority - Neither the Commission nor the Executive

Director had special legal authority to do anything other than to coordinate and gather information. However, because the members of the Commission were of Cabinet level, they had ample authority to direct whatever needed to be done within their areas of statutory responsibility. Since I reported operationally to the President of the United States, I was able to draw upon the leverage of the President in urging departments and agencies to action. The fact that I also worked for Senator Anderson, a very powerful Senator who was close to the President, further strengthened my position. Lee White, an assistant to the President, and Harold Seidman at BOB were of great assistance.

Centralization vis a Decentralization Organization of the effort involved both policy level coordination in Washington through the leadership of Senator Anderson, supported by the Executive Director, and the operational coordination under my supervision. To conduct day to day operations the Commission quickly authorized me to establish an Alaskan Field Committee which was headquartered in Anchorage, Alaska. This Committee was composed of the principal representatives of each federal department located in Alaska, and chaired by Mr. Burke Rielly, who was regional Coordinator for the Department of Interior which had by far the biggest federal program in Alaska the time of the earthquake. The Field Committee members forwarded information through two channels, one to their superiors in

Washington, and simultaneously a copy direct to me. This approach accelerated departmental reporting at an amazing rate. I received weekly reports on progress and problems of each project in each community. When a problem emerged I simply phoned the lead agency at some level which ranged from a GS-13 in the field to a Cabinet member or the Alaskan governor to help correct the problem quickly before it became serious, an approach not possible when one relies on memorandum and hierarchical reporting. I prepared a weekly progress report for Senator Anderson and the President, which the White House released to the press. This provided an added incentive for performance, since I singled out both good and bad performances by various departments and agencies.

Task Forces A series of nine task forces were set up, each to deal with a particular area of concern which had to be addressed during the reconstruction effort.

o Community Facilities. Although the work horse of the reconstruction of community facilities was the COrps of Engineers, with Navy providing a similar role in Kodiak, we established a Task Force to deal with public buildings, the health aspects of reconstruction generally, and the special needs of the Indian communities.

o Economic Stabilization. Because inflation was already high in Alaska, there was great fear that the influx of construction would drive prices totally out of reach. We established a volunteer wage and price control system which was based largely upon housewives, business men, and union members. This volunteer effort turned out to be extremely effective, and inflation did not result from the rebuilding.

o Financial Institutions. A great deal of effort was devoted to the various types of loans and loan guarantees that might be available to businesses, as well as the financial health of the State of Alaska which sustained a body blow while still in its infancy.

o Housing. The rebuilding of housing, and the role of government in that rebuilding, required a special effort.

o Industrial Development. We regard it as very important that the rebuilding be done in such a way as to facilitate future development. Small boat harbors, for example, were generally rebuilt to twice their size at the time of the earthquake this required special legislation, but we were very reluctant to rebuild facilities which were already antiquated at the time of the earthquake.

o Natural Resources Development. Because of the nature of Alaska, and the large amount of land under public control, the impact of reconstruction on the natural resources of Alaska was of critical interest.

o Ports and Fishing. Since the economy was dominated by the fishing industry, the rebuilding of the ports, and the operation of the canneries was vital. An unexpected task dealt with striving to counter illegal fishing by other countries, particularly U.S.S.R., in alaskan fishing waters.

o Transportation. Because all of the modes of transportation in central Alaska were rendered unusable by the earthquake, this task force was required to move forward with tremendous speed. All modes of transportation were restored in a surprisingly short time, although in many instances temporary bridges and roads were required until the permanent structures were built over a longer period of time.

Scientific and Engineering Task Force Of particular interest to this group was this key Task Force which involved extremely able men from the U.S. Coast Geodetic Survey, the Geological Survey and the Corps of Engineers. Because of the great importance of their report, it is attached to this statement.

Openness Because our work affected the future welfare of people in Alaska in far more ways than the customary post-disaster rebuilding, I thought it was essential that citizens be informed and involved to the maximum extent as we moved forward, an approach approved by Senator Anderson and President Johnson. Yet the special time constraints permitted very little in the way of special meetings to explain and defend what we were doing. We did not have time for public hearings. Therefore, I opened all of our meetings in Alaska to the public. This often meant spending many hours before meetings could finally be adjourned, but virtually everyone had an opportunity to be heard and to see firsthand what we were planning. In one instance, we spent all night discussing the fate of Valdez. At the beginning I advised the citizens that we could provide federal support to the rebuilding of Valdez only in the event that the people decided to relocate the whole town to a safer location. This was clearly a difficult decision for them, and required extensive discussions through the night. When the citizens finally decided to move, I went back to what was left of the damaged Valdez Hotel in bright morning light.

This open policy paid an unexpected dividend. It provided people with a clear understanding of why we were taking unpopular steps in the interests of mitigation. Although they were not always persuaded, they did not question our motives and their opposition was greatly reduced in most cases.

Avoidance of Red-Tape We rejected the customary governmental procedures in most instances, and concentrated on observing legal requirements rather than administrative procedural requirements. For example, we often ignored requirements for public hearings because they were very time consuming and largely unnecessary in an operation that was so open to the public. In establishing schedules for various projects, I frequently used as a rule of thumb taking the customary length of time for certain actions, then dividing that by ten and using the resulting 1/10 of the normal time as the base from which to strive to make further cuts in the time required to design and construct. That forced people to ignore most of the procedural maze that normally frustrates decision making and action in the federal bureaucracy. The result was design and construction at a record setting pace for peace time.

Intergovernmental Emphasis We dealt with each project on a community basis. We developed a Seward plan, a Valdez plan, a Kodiak plan, as examples, rather than a federal plan, a separate state plan, and a separate local plan. We had two for Anchorage. The development of these plans was done jointly. All of our meetings involved all three levels of government, and the basic decision making was done sitting around a table, rather than by memorandum.

In these intergovernmental meetings we would reach tentative agreement with respect to the timing and the funding of each project for an individual activity. There were scores of individual activities involving water, sewer, roads, railroads, highways, docks, homes, businesses, etc.. Each agency at each level of the government then would review these tentative agreements with their staff in their respective offices, and at the next meeting, generally 10 days later, we would reach a final agreement. I have to concede, however, that our guidelines and the agreements we reached at the policy level of the three governments often were not supported by the engineers who understandably regarded our schedules as highly unrealistic, because they were far tighter than any prior experience that would indicate they were possible to achieve. I insisted that the Corps of Engineers and the Navy incorporate strong payment incentives and stiff penalties in the contractual provisions relating to timely completion of construction. I and my small staff personally inspected all of the projects, and discussed problems with anyone working on a particular project, regardless of their organization. To avoid confusion, we were always accompanied by state and local representatives.

The state coordinator, Mr. Fitzgerald, had access to all of our files and records in the Alaska Field Committee. In Washington,

the Alaskan Attorney General who had been designated by Governor Eagan as liaison with the Federal Commission, participated in our meetings and also had free and open access to our files and records.

PROGRAM APPROACHES

Analysis before Construction In no major disaster in the United States has there been such pressure to move forward with the rebuilding, both because of the short construction season and because of the pervasive impact of the earthquake on the state. Despite this urging, the Commission established a policy at the outset that soil instability was so crucial with respect to ground movement in future earthquakes that reconstruction would not begin until extensive soil surveys had first been conducted. Earthquake hazard mitigation was a paramount consideration throughout our planning. We drew together all of the drilling rigs we could locate, including a number that I borrowed from the Atomic Energy testing grounds in Nevada, and virtually blanketed certain areas, especially in Anchorage and Seward, to determine the composition of the soil and its susceptibility to future earthquake action. We received heavy criticism for deferring most design and construction for a number of weeks while soil testing was underway. In view of the

short construction season, this impatience was understandable, but we were determined to minimize rebuilding that was unduly vulnerable to future earthquakes.

Our scientific and engineering task force included a field team which had two principal objectives:

- Developing plans for field studies required for reconstruction
- Recommending areas suitable for reconstruction, and establishing interim zoning and design criteria to guide construction in that earthquake prone region.

Mitigation Measures Much of the damage of the Alaskan earthquake was attributed to land and submarine sliding, differential compaction due to the vibration and lurching, and the regional (tatonic) subsidence and emergence. These were potential hazards which had been flagged before the earthquake, and ignored. The Commission recognized immediately that areas underlain by soils that are susceptible to sliding in differential compaction should be avoided in rebuilding to the extent possible. In a few cases where it might be necessary to build in such areas, special care would need to be taken to avoid overloading, such as specifying parking lots or limiting construction to two or three stories. Particular precautions were taken to avoid loading the heads and/or unloading the toes of slide areas. Clearly, zones of fissuring at the heads of slides should be avoided.

The most controversial aspect of our rebuilding grew out of our red-lining of high risk areas in which as a matter of policy the federal government decided it would not provide any loans, guarantees, or other assistance for rebuilding. These delineated areas were based upon the recommendations of the scientific and engineering task force, and encountered considerable hostility from individuals whose property was located behind these lines.

We found that seismic zone 3 requirements of the 1964 edition of the Uniform Building Code were reasonably adequate, but a thorough understanding of some design aspects was often lacking on the part of architects and structural engineers. In addition, inspection was often too lax.

Serious fires, especially at Seward, developed during the earthquakes as tsunami action burst exposed POL facilitates and the oil was ignited by broken power lines. As recommended by the Task Force, I insisted that they be rebuilt in locations with less proximity to buildings and that ring dikes be placed around them.

Considerable effort in reconstruction was devoted to better observance of earthquake resistive design standards and reconstruction practices that would minimize damage from future

earthquakes. Local authorities were urged to consult experienced structural engineers who were familiar with earthquake resistive design to assist in reviewing structural rebuilding designs.

Long Term Study The Scientific and Engineering Task Force also had a longer range assignment of laying the groundwork for a scientific study of Alaska which President Johnson asked Donald Hornig, Special Assistant to the President for science and technology, to develop. This study was to draw upon the U.S. Coast and Geodetic survey, the U.S. geological survey, the National Science Foundation, the U.S. Air Force, the Corps of Engineers and such other agencies as might need to be involved. The National Academy of Science was also to be involved, and Dr. Hornig was to coordinate his activities with that of our Commission. This was to help guide future development in ways that would mitigate the impact of future earthquakes.

A progress report on Alaskan Reconstruction entitled "Response to Disaster" was released in September, 1964. By November the construction season ended, but water and sewer systems were rebuilt, airports were in full operation, small boat harbors were repaired sufficiently to be usable, highways were operational, and the railroad was running (at reduced speed). Houses and businesses were temporarily repaired, though full reconstruction would extend into the following year as did some

of the stabilization work particularly in Anchorage. The major exception to this timetable was Valdez where the total relocation of the town required several years.

The Commission regarded its work completed by the end of the 1964 construction season and disbanded, leaving behind no office to write a final report on its work.