Remarks Relating to the Current Environmental Crisis

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It is a privilege for me to join you tonight at the installation of officers for the Charleston Post of the Society of American Military Engineers. I particularly appreciate having this opportunity to speak to you who are involved in planning and building public works. These are difficult times for those of us who design and construct large projects for, in addition to the many unknowns which have always confronted us in our business, a new element has recently been injected into the problem. I refer to considerations of the environment.

During the past year or two, as you are well aware, many elements of the American public have become increasingly concerned about the preservation and enhancement of natural values. Great emphasis has been placed upon scenic beauty and protection of fish and wildlife and at every hand we are enjoined from any action which might adversely affect them. More and more reasons are advanced for why we should not build projects. To an ever-increasing degree we engineers are finding ourselves in the middle of a conflict of demands--demands on the one hand that we develop our Nation's resources so that they can be used and demands on the other hand that we preserve those same resources in their natural state.

This week has been called Earth Week. It has been given over to teach-ins at many schools and universities designed specifically to acquaint America's youth with the many threats to the environment and to activate them to protect it.

These are worthy objectives and I approve of them. I am concerned, however, that none of the teach-in programs that I have seen include any discussion of how we are to achieve those objectives and at the same time meet the demands imposed by a growing population and a rising standard of living. The present situation is a complex one. Indeed its problems will not be solved by such simplistic proposals as stopping population growth, lowering the standard of living, or stopping the construction of any potential source of pollution be it solid, gaseous, thermal, noise or esthetic. Stopping construction does not solve our problems; it merely shifts them to other areas. In fact, it reactivates the same demands that caused construction to be undertaken. The consequences of such extreme measures to protect the environment may well be worse than the ills they seek to cure; nevertheless, we cannot afford to dismiss them out of hand on that basis.

For the simple truth is that there have been, and are, many serious and unnecessary abuses of the environment. And in those cases we engineers have often been parties to the abuses. We did not commit them deliberately with malice aforethought, but neither did we give conscious mately to the courts, contending that its construction will consideration to minimizing or avoiding negative impacts. In general, we have more or less passively served the demands expressed directly or indirectly by the American public. Yet, as a result of this passive attitude we are under development project by appealing to the public, and ultiheavy attack today. So in the next few minutes I want to discuss with you how we engineers can live and work in the rather hostile environment of the current environmental crisis.

You may have heard the word ecotactics used recently. It is a hybrid word meaning the tactics to be employed by political activists who are engaged in frustrating some development project by appealing to the public, and ultimately to the courts, contending that its construction will adversely affect the ecology. Ecotactics is rapidly emerging as an effective system, but primarily in a negative way. Those of us whose business requires us to think positively --and I include engineers in that category--can learn a lot from ecotactics. But if all we learn is better ways of projecting our image, we will have missed the point of the present controversy. What we need to learn, above all else, is to satisfy the just complaints which have caused it.

I think the time is past when we can remain passive. We engineers must become increasingly involved in discussing our work not only to justify it, but to indicate to the public why we believe it is in the best public interest. By this I do not mean that we should be advocates, but neither do I believe that we can sit by while measures are adopted which are *not* in the best interests of our nation and its people. As we enter into a dialogue with the environmental activists, we must take great pains not to become sarcastic or to talk down to them. These are intelligent people with whom we are dealing and I believe that the great majority of them are honestly seeking the truth. In this dialogue, however, we must ourselves be seeking the truth as we present our case with a view to convincing them. I believe that we can do so by telling them what we see as the truth in terms that they will understand. On the other hand, if we attempt to ridicule those who are raising questions or if we adopt the position that these are technical matters understood only by technicians, we will only destroy the basis for public acceptance of our proposals. And in the final analysis public acceptance is the goal which both sides of the controversy seek.

In seeking that acceptance for our work, we must go beyond merely telling the truth when questioned by outside sources. We in the engineering profession must begin to question ourselves more intensively and we must be just as truthful in our answers as we would be to outsiders. We must consider all the consequences of our work and look for alternatives which alleviate the undesirable features of these consequences. In many cases, these alternatives may be non-structural. One obvious example would be reducing flood damage through flood plain management. This is a very difficult concept for engineers to grasp. I have had many of them tell me that "I didn't study structural engineering for four years in college just to adopt a non-structural alternative." Yet the fact remains that it is our duty as responsible engineers to consider every reasonable alternative and to adopt the best one--in terms

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of balancing satisfaction of needs with protecting the national environment—whatever it might be.

Actually, when you examine the record closely you will find that the Corps of Engineers has not been remiss in protecting the environment. On the contrary, we have achieved a fine record of achievement in this regard. It was the Corps that was instrumental in establishing and operating Yellowston, Yosemite and Sequoia National Parks. It was the Corps that took sufficient lands in proximity to our projects – 30 or more years ago – to create the great Mississippi Flyway for migratory birds. Even as we met the demands of our people for ports and harbors and inland waterways, and later for flood control and multiple purpose projects, we have gone well beyond what strictly utilitarian considerations might dictate, especially in recent years. Not only have we sought to preserve the natural beauty of our projects but we have worked for several decades to develop their recreational aspects. Thus, the Corps of Engineers has made available sites and facilities which last year provided more than 400 million visitor days of recreation to the American public – a figure which exceeds the *combined* total of both the National Park Service and Forest Service.

So the record clearly shows that for many years the Corps has been concerned with the matter of environmental values and I am convinced that we are fully capable of serving as a leader in this area both today and in the future. But we must recognize that the definition of and knowledge about environmental values has changed drastically over time, and we must act accordingly. They have evolved from consideration for wildlife and outdoor recreation through concerns for natural beauty to the current emphasis on ecology and the fundamental impacts – positive or negative – of our engineering works on natural systems.

Unfortunately, we have not always distinguished ourselves in determining what the consequences of our work might be. In this we are not different from the practitioners of other professions. But that is not the point tonight, for regardless of how others have done, we must improve our own performance. To give you an example of where the consequences of our work may lead us, consider the Cooper River project, here close at hand. When the Pinopolis powerplant was built, water was diverted from Lake Marion into Lake Moultrie through the plant where it turned the generators and out into the Cooper River. Thus, water from Lake Marion, which had previously flowed down the Santee River into the sea is now carried by the Cooper River into Charleston Harbor. The most immediate effect of this change has been heavy siltation and shoaling in Charleston Harbor. A new project has been proposed to alleviate this undesirable condition. It calls for relocating the plant to a new site where it can draw water from Lake Moultrie and discharge it into the Santee, thus reducing flows in the Cooper and eliminating the conditions which cause shoaling in Charleston Harbor. This project was authorized in 1968 and is included in the President's Budget for 1971. Funds for its construction have been appropriated and will soon be available.

Thus, we have proposed to take care of an environmental problem, caused by engineering, through more engineering works. But the environmentalists are likely to ask what the effect of these new engineering works will be. It would be difficult indeed to provide them completely satisfactory answers based on the types of investigations which have been accomplished to date. We have got to make more and better use of the growing body of knowledge about the interrelationships between components of natural systems, and to weigh more carefully in the scales of decision the environmental or sociological costs associated with the construction of this and all our other public works projects.

I would expect that the Cooper River project will be questioned repeatedly on the basis of its potential ecological effects. I hope that those who know this region far better than I will help the Corps of Engineers in anticipating these questions and, above all, assist us in seeking out the answers. You should take the initiative in this type of investigation and having taken it you should retain it. But you must treat the questions fairly. Not to take full advantage of the growing body of ecological (natural systems) knowledge would be both unprofessional and politically unwise. We see growing proof of this latter point each day. If our normal investigations and decision-making procedures do not give fair due to environmental and ecological considerations, then I think we can anticipate that the courts will require it to an ever-increasing extent. Ecological considerations are now a matter of Federal law. If you are not already familiar with it, you should get thoroughly familiar with the requirements of the National Environmental Policy Act of 1969. As a likely harbinger of the future, you should be aware that a Federal court has just granted an injunction which will likely delay the start of construction on the Trans-Alaskan pipeline for an indefinite period because, among other things, environmental groups contend that the project has not been evaluated in accordance with the requirements of the National Environmental PolicyAct.

The Water Resources Council is attempting to develop an evaluation system which will enable Federal agencies to compare environmental or ecological values with other project benefits and costs. Although this system has not been refined to the point where we can use it, in essence it will involve a determination of the economic opportunities foregone if the project or some of its features are not built in order to protect the environment. Everything we do or fail to do involves a cost to somebody. Preserving the environment, even by doing nothing, can be a very costly business if, for example, by doing nothing we continue to incur flood damages or deny to the people who need them the benefits of an adequate water supply or electricity or cheap transportation.

One example of the tradeoffs which exist between development and the protection of the environment is found in our project on the Red River in Kentucky. Last year, in response to the demands of the State Government and the Congress, we moved the site of the dam downstream nearly 5 miles, thereby preserving about 2 miles of whitewater in a scenic gorge. The cost of this relocation can be expressed in terms of dollars – $3 million additional construction cost – and in time – 3 more years will pass before the people in the Red River Valley will have the water supply and flood protection that they so urgently need and which were the original purposes of the project. We are gradually accumulating other data of this nature through our experience around the country with similar controversial projects. Eventually we may be able to produce a catalog of environmental factors, in terms of their cost, but until that time we must somehow deal with the objections which are raised to our work and get on with it. I say this, not as a partisan of the Corps of Engineers which I most definitely am, nor as a professional engineer which

I also am, but rather as an American citizen interested in the welfare of our nation, both present and future.

I am concerned that our country's future may be threatened today by over-enthusiastic preservationists, just as it most certainly is threatened by over-zealous developers. The basic problem that confronts those of us who construct is to reconcile these diametrically opposed views. We must somehow accommodate both of them. We must make adequate provision for the development of our natural resources to support the expanding economy required by a growing population and a rising standard of living. At the same time, we must preserve and enhance those features of our environment which make life in America a thoroughly enjoyable experience. We cannot permit ourselves to be captured by either of these approaches to our country's problems. Without moderation the one would exhaust our natural wealth, while the other would stop the industrial progress which has made our nation great. We could retreat behind the wall of claiming that we need guidance from the administration, from the Congress or from the people, but if we do this I would not expect us to be building the things that our country needs. I believe that as engineers it is our duty to point the way and before we can do this we, as a profession, must give serious thought to how we can proceed with our work in such a way as to satisfy all the demands that are placed upon us.