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REMARKS BY
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Good Morning, everyone. I am very pleased to take part in your conference on quality assurance. To my mind, there are few subjects more important in industry today--both from a regulator's point of view and from the point of view of an industry executive.

The job of a keynote speaker, I understand, is to try to get everyone on the same key. This is very important in music in order to achieve harmony and avoid discord. Maybe it will work here as well. The best key for me, presumably, is C-Sharp; I clearly do not want a B-Flat. Your conference theme, "Quality - An Ounce of Prevention," is certainly appropriate for nuclear projects. This morning, I intend to highlight and emphasize the extent to which quality assurance must be the central focus for the nuclear industry. Quality Assurance, or QA, is indispensable to obtain a well built and safely operated facility. Further, with the billions of dollars it now takes to build a new nuclear power plant, dedication to the principle of Quality Assurance is necessary to the very survival of the sponsoring utility itself. Also when one considers the cost of work stoppages and corrective actions, the inattention to QA that inevitably leads to design deficiencies or shoddy workmanship can only be called bewildering.

Upon becoming Chairman of the Nuclear Regulatory Commission I was struck by the disparity in quality assurance effectiveness among the utilities constructing nuclear power plants. Some were doing a good job. Others were not doing too well.

As NRC Chairman I became acquainted, first hand, with the stunning fact that--at least among some utilities building nuclear power plants--Quality Assurance programs were accorded a low priority, and at times Quality Assurance personnel were ignored, some even abused.

I was distressed by the examples of the lack of Quality Assurance-consciousness that came to my attention, and I said as much to industry leaders. Since then, at a few sites, strong corrective measures have been taken, but at some other sites serious problems still exist.

I hope that in focusing on our QA problems, I do not mislead you into believing that nothing is right with the nuclear industry. Despite its many setbacks, the nuclear industry is still alive and is effectively helping this nation meet its energy needs.

In addition to the 74 nuclear plants licensed to operate and 3 others licensed for low-power testing, this nation still has some 64 nuclear power plants under construction and 5 plants under construction-permit review.

The plants already licensed to operate have been generating an average of roughly 250 billion kilowatt hours of electricity per year over the last several years. This is not an insignificant contribution to meeting our energy needs.

There is, of course, concern that some of the plants under construction will not be completed, but I believe that we must still keep our attention on those that will be built.

Yes, the nuclear industry faces problems, some of them technical and many of them non-technical. You know many of them as well as I do. But people in the industry must not let the problems dishearten them and belaud the successes achieved to date or their ability to solve the new issues facing them.

The major non-technical problem, I believe, is that arising from the fact that the rate of growth in the demand for electricity has dropped off significantly during the last several years. As a result, starting new plant construction now is hard, if not impossible to justify.

However, even with a significantly lower growth rate in the demand for electricity, the demand will begin to challenge our existing capacity in a few years, and new plants will have to be built. Along the way, some old power plants will have to be replaced. In many parts of the country, coal and nuclear will be the chief viable options. Whether or not the nuclear option receives favorable consideration will depend on:

- the public's confidence in nuclear power;
- the utility's confidence in the stability of the regulatory process;
- the utility's confidence in predicting construction costs;
- our shared confidence in the satisfactory resolution of technical problems; and, above all,
- continued operation of existing and new plants without major accidents.

Continued work is needed on meeting each one of these conditions.

A number of you with whom I spoke at the reception last evening were seeking words of encouragement from me about the future of the nuclear industry. Of course my crystal ball is no less cloudy than yours. But I believe that if we persevere in satisfying the five conditions I just mentioned, utilities will give favorable consideration to the nuclear option when they plan new construction. New orders for nuclear power plants will then develop.

We in the NRC are trying to do our part and I know that industry is working to do its part in this endeavor.

Our aims are the same: safe, reliable and, for the ratepayers, affordable nuclear power.

It is in fulfillment of these aims that we focus on resolving the problems being faced. For nuclear plants under construction, effective QA plays a central role. QA breakdowns must be avoided if our aims are to be met. This brings me back to the main thrust of my talk.

I believe that QA breakdowns have occurred, and are most likely to continue to occur, where there is a conspicuous absence of serious interest in QA at the top managerial level, where day-to-day operations are geared to maximum productivity with minimum quality confirmation, and where the letter of procedures and requirements may be observed but the intent behind them is rarely if ever stressed.

It is a commitment on the part of management--a visible, unmistakable, serious commitment--that makes QA work. Last week, in Atlanta, I had the opportunity to address chief executive officers of utilities having nuclear plants, and I spoke of quality assurance as the field of action that can restore and give substance to public confidence. I stated that QA should be the central focus now throughout the industry. I hope that proves to be the case.

Now let me tell you some of the things we have done and plan to do at the Nuclear Regulatory Commission to strengthen our oversight of the nuclear industry's QA activities and to demonstrate our determination that QA shall be given the attention it deserves.

I hope that after I have gone over the steps we are taking, you will have no doubts about our seriousness.

As an initial step, we reviewed some of the disturbing QA problems that had come to our attention. Our review indicated that these problems generally represented three distinct types of failures.

First, there is the failure of management to maintain quality, leading to an initial deficiency. Second--and this is a crucial lapse--is the failure of management's QA program to detect and correct the deficiency. Third is our failure--NRC's failure--to bring the deficiency to light or, having done so, to recognize the nature and extent of the problem.

The first two failures are clearly attributable to a lack of commitment to quality on the part of management. This basic failing is compounded, however, by a lack of understanding of the role of quality assurance on the part of the project management team and by a lack of understanding on the part of personnel at all levels of the project as to what QA requires of them.

If senior managers have a strong commitment to quality and in turn indoctrinate capable project management teams with that commitment, these teams will be able to communicate

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That commitment to all other involved parties. Specifically, the project management team communicates and obtains through contractual and procedural arrangements with the designers, fabricators, and constructors a level of quality commensurate with the owner's commitment.

The commitment to cost and schedule must be properly balanced with quality through these contractual and procedural arrangements.

For example, if a contract emphasizes primarily the schedule for physical installation, the message from project management is production. On the other hand, if the contract also emphasizes owner-accepted, adequately-documented installation, the message is quality as well as production. The latter case provides the proper incentive for getting work accomplished right the first time. This is then reflected in the policy and procedural direction to the various organization sub-tiers.

Quality assurance must be an integral part of all of the project planning and management activities from the beginning, and its role must be communicated and fully understood by all participants in the design and construction process--from senior management to each craftsman.

If Quality assurance is planned and conducted as an integral part of physical installation activities, then early detection and correction of inadequacies will result in enhancing quality and improving control of costs and schedules. All participants must be adequately trained to understand and obtain these benefits.

I cited a third contributory failure behind QA deficiencies in nuclear power plant construction. It is the regulator's failure--our failure--to detect initial management control lapses and to detect subsequent ineffectiveness of the management's QA program.

We have identified two underlying reasons for our failure. First, our programs have not addressed design quality as specifically and extensively as some other areas. Second, our licensing and construction inspection programs have not historically given sufficient attention to project management control at construction sites. These aspects of the construction process have consequently become the subject of new and special attention.

A number of initiatives put forward by the NRC staff have been adopted in an effort to raise our level of confidence in the quality of design and construction and in the management control of that quality. However, these are not intended to supplant the basic responsibility of the owners and operators of nuclear facilities who as always retain the ultimate responsibility for quality and safety. Let me mention some of the measures that have been undertaken. Of particular importance is a series of evaluations for construction projects nearing completion.

The first is a self-evaluation by the prospective applicant for an operating license. It entails a comprehensive assessment of the quality assurance program for both design and construction, covering such items as the level of management involvement, the audits and reviews implemented during the project, and the problems surfaced plus the corrective actions taken. I also believe that utility self-evaluations should include scrutiny of contract language at an early stage of construction to confirm vendors' QA commitments and the efficacy of their QA programs.

Self-evaluation is especially important to the utility because its Chief Executive Officer is now required to certify that the facility has been designed, constructed, and tested in accordance with the Final Safety Analysis Report and other license commitments.

I am gratified to know that industry is also undertaking a substantial initiative for plants under construction. The Institute for Nuclear Power Operations--known as INPO--has developed programs and criteria for evaluating quality assurance of design and construction activities at nuclear power plants. Some utilities are currently using this guidance to conduct self-evaluations. Based on results of these evaluations, industry may consider development of INPO independent audits of design and construction analogous to the audit program presently conducted by INPO at operating plants.

The next step, after self-evaluation by the utility, is our evaluation of each candidate facility for an operating license. We consider significant problems noted at other construction sites, as well as any past problems with the licensee or contractors on the project.

We also review the project's inspection and enforcement history.

We have even gone further to urge or require some utilities to conduct an independent design review of a selected system or systems in sufficient depth to assess, on a sample basis, the adequacy of the QA program. This option will be kept open at least until industry programs and other NRC programs can be permanently adopted with the same or better reinforcement of confidence in quality.

Another new NRC approach for plants in early stages of construction is our CAT inspection. That is a Construction Assessment Team of inspectors who move onto a construction site and cover a broad array of activities there--quality assurance, design controls, project management, construction controls, procurement controls, and so forth. The team will be comprised of about eight inspectors, half of whom are NRC staff and half are under contract to the NRC.

Each team will devote about two and one-half months to a site inspection, counting preparation time and post-inspection reporting. Trial inspections already performed indicate that this approach may be more effective in identifying management control problems than our routine inspection procedures.

Yet another innovation with significant potential for QA payoff is the joint sponsorship by NRC and industry of seminars involving senior management of the nuclear industry. We are looking to use this kind of event to impress upon top executives and managers the meaning and the value of QA, and to enlist them in the drive to instill QA-consciousness at all levels.

Managers from utilities which have experienced serious problems with quality assurance will be asked to participate, as well as those with markedly successful programs. As we envision them, the seminars will be conducted with assistance from independent professional, utility and contractor representatives having special QA interests and expertise. I expect a number of you present in this room will become involved in these undertakings. I hope the prospect will excite your interest and enthusiasm. As an outgrowth of those seminars, we will be asking each utility with a facility under construction to sponsor training sessions for personnel involved in design and construction, emphasizing the contribution of each individual toward ensuring quality. This is no minor matter. We are talking about additional training for thousands of people working on nuclear power plant construction.

With a fuller understanding of QA responsibility in the rank and file, and the commitment I have spoken of at the management level, I am hopeful that we will begin to see QA-consciousness working as an integral part of nuclear project planning and execution.

I have only highlighted some aspects of NRC's recent QA improvement initiatives. You will have the opportunity to hear more about them in other sessions during the course of your meeting.

Perhaps you have noted that, throughout my remarks thus far, I have been invoking the vital role of QA in design and construction activities. However, the safe and effective operation of nuclear facilities is the purpose of all these efforts. Thus, the application of QA to that final, continuing phase must not be neglected.

For example, there is the need to maintain a high level of control room discipline at all facilities. Any deficiency in professionalism in the nerve center of nuclear power generation cannot be tolerated. Pervasive attention to this type of quality assurance is required throughout the life-cycle of a facility. To neglect any aspect of it jeopardizes the whole of it.

The campaign to propagate the QA state-of-mind to all sectors of industry and all phases of design, construction and operation needs the guidance of experts such as you to really take hold. The time for it is certainly ripe. QA breakdowns at nuclear construction sites have created urgent needs for serious and enduring reform of QA attitudes. This society, and this conference, can have a great deal to do with meeting these needs. I extend to you my best wishes for success in this endeavor.