COMMITTEE TO BRIDGE THE GAP
1637 BUTLER AVENUE #203
LOS ANGELES, CALIFORNIA 90025
(213) 478-0829

April 8, 1985

Chairman Nunzio Palladino
Commissioner James Asselstine
Commissioner Frederick Bernthal
Commissioner Thomas Roberts
Commissioner Lando Zech
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Commission meeting on source terms, April 3, 1985

Dear Commissioners:

I am writing to thank you for the opportunity to present my views on the source term issue on April 3, 1985.

I would also like to make the following corrections and additions to my testimony.

(1) My paraphrase of Chairman Palladino's statement in "Inside NRC" on the ethics of regulatory research by industry was incomplete and therefore misleading. The statement printed in "Inside NRC," itself a paraphrase, reads:

> On the ethics of NRC research contracts, Palladino believes it's "definitely unethical" for an entity under threat of regulation to do research relating to that regulation. (6/29/81, attached)

I inadvertently deleted the clause on NRC funding of such research.

If I stated or implied that source term researchers employed by industry are guilty of any ethical impropriety, I regret it. Such a statement would be unfair and untrue. My point was that financial interest on the part of a sponsoring entity can sometimes influence the outcome of the sponsored research, or at least influence its presentation. I suggested that a similar phenomenon might account for the discrepancy between the industry position as advanced by the American Nuclear Society and that of the disinterested American

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Physical Society Study Group.

(2) In response to a question from Commissioner Bernthal, calculations from first principles do not by themselves rule out the possibility of early containment failure, even in large dry containments. The discussion of the problem of rapid core melt ejection as a cause of early failure on pp. 69-70 of the APS Report does pertain to these containments.

I do not have an opinion at this time on the probability of this event. I note, however, that the APS found it significant enough to recommend that research be undertaken to resolve the uncertainties involved (cf. pp. 153-4, 209), and that such work has begun at Sandia National Laboratory.

(3) Lastly, I wish to note an incidence of containment isolation failure even more recent than the one mentioned in my Statment. The APS Report states (p. 153) that "It is not inconceivable that a large equipment hatch could be left open during reactor operation." Evidently, something quite like this actually occurred a few weeks ago at San Onofre Unit 1. As described in the enclosed clipping, both doors of an emergency hatch leading into the containment were left open during cooldown of the reactor.

Again, I appreciate your willingness to hear and consider my views on this matter.

Yours sincerely,

Steven Aftergood
Executive Director

'JOE' PALLADINO T 'ES NRC REINS

SERs, OPERATING PLANTS, CONTROLS, AND ATWS TOP NEW CHAIRMAN'S PRIORITIES

Nunzio J. Palladino was sworn in as an NRC commissioner June 24 by Chairman Joseph Hendrie, a friend since the days both served on the Advisory Committee on Reactor Safeguards, a friend Palladino will replace as NRC chairman July 1. In his office at Pennsylvania State University, where he has been dean of the college of engineering for the past 15 years, Palladino told Inside NRC he will begin his tenure as chairman without a lot of direction from the Administration. "I haven't received much advice," he says, "but I know they are anxious to get the logjam on licensing broken."

To that end, Palladino wants first to line up the staff to complete the safety evaluation reports (SERs) and environmental impact statements in time for licensing. "I'll look to see if people are doing things they don't have to," he says, adding that the Three Mile Island action plan has been getting a lot of attention and some staff may be taken off that project. Palladino feels farming out of analytical work to the national laboratories should be stepped up. Maybe NRC will need more people, he feels, and there's a "good basis" for asking for additional personnel. On the other hand, he feels it's hard to recruit and assimilate new people.

To tighten the licensing process, Palladino wants to raise the level of difficulty for admission of contentions, and ask for greater specificity on "what's bothering the individual," rather than admitting very general contentions.

"I don't want to throttle sua sponte," Palladino says, adding he'll see what options are open as a basis for restructuring it. "Sua sponte should be allowed if someone comes and says 'I work at a plant and this is a safety issue'." It's one of the many issues Palladino says he'll feel his way on, however. Feeling his way is also a method he'll use in reconciling differences within the commission. His way is to find a consensus. "I'll go up to someone and say I respect your judgment," he says. "I want to talk it out." He believes in protecting the minority point of view, and hopes there aren't too many 3-2 decisions.

Palladino will also feel his way on rearranging NRC staff. For the time being, he will keep most heads of offices, he says, but he doesn't preclude the possibility of changes being made.

As for the commission's focus, Palladino says he will pay more attention to operating plants, and "operator training leaves something to be desired." He'll push for the presence at each plant of someone capable of diagnosing transients, plus establishment of an integrated point at which that person can get all the information he needs. A simplified control panel design by the Nuclear Safety Analysis Center, he says, is a better idea than "complex control panels with alarms going off and lights flashing." Such simplified panels can be installed at a reasonable cost, he thinks.

Regarding the inspection process, Palladino suggests licensees take a more aggressive role in preparing for NRC visits. Increased frequency of inspection may be necessary, Palladino suggests, not across the board, but for reactors where things aren't going well.

It's early to give advice to industry, he says, but he urges that nuclear licensees recognize that some issues that come up are real issues and should be taken seriously. "Attitudes have changed in the last few years," he says, "but still, things are being done that aren't done in the good spirit of cooperation." Housekeeping, for one, he criticizes at some plants. Plants, he says, must be clean and well-organized, adding that this is symptomatic of more than just cosmetics.

As to advising the public, Palladino says he doesn't know how to convince laypersons their interests are being well represented. "Our actions will have to speak for themselves," the incoming chairman says.

The safety issues he shows most interest in are ATWS and station blackout. ATWS (anticipated transient

without scram), he says, a problem he was working on when he was on the ACRS in 1974. "It may be that anything that goes on that long may indicate the system is not all that straightforward," Palladino says. He won't prejudge the issue, but would like to bring it to some conclusion within the next six months.

The overriding importance of off-site power was revealed at TMI-2, Palladino says. "There should be redundant lines from different directions." He shudders, he says, at reports that a helicopter was seen flying close to some power lines during the accident. If those lines had been cut, he suggests, the cooling pumps could not have been adequately handled just by auxiliary power. The question of station blackout is one he says he plagued the ACRS with during his tenure, so much so, he says, that he annoyed other members with it.

Among the other important lessons taught by the Three Mile Island accident, he says, is the importance of balance-of-plant interaction with the nuclear steam supply system. "The NSSS is only one component of a plant," he says; its interaction with other parts "is something that must be understood, not left to chance."

The accident also showed that "across the country, control rooms just haven't gotten enough attention." One revelation, he says, is the broad range of control room design – "from very good to very bad" – indicating, he says, the amount of attention paid by the industry to control rooms. "The TMI-2 control room was not one of the best," he observes. "Even the TMI-1 control room was better."

One subtle lesson from the accident, he says, is the importance of examining just how to tell operators beforehand what to do in certain circumstances. "TMI had very prescriptive procedures," he says, adding he believes they "weren't broad enough to allow for all circumstances." TMI demonstrated also "that people have an important role in plants," moving again to campaign for one of his favorite causes, "the importance of operator training."

While papers Palladino has written emphasize the critical role he sees nuclear power playing in the future U.S. energy economy, he says he's unconcerned personally whether "coal or nuclear or even solar" power takes the lead in meeting U.S. energy needs. But the short-range outlook for nuclear power, he adds, "tends to be discouraging to the industry." Describing the regulatory process for nuclear plants as "not that predictable," he observes that utilities are therefore unable to calculate costs, a problem he believes should be tackled by making the process more predictable and by setting some safety goals.

Safety goals, he says, "should be quantitative insofar as that's possible." A single safety goal may not be sufficient. "In the process of evaluating specific components and systems, we may find that we need a subset of goals," he says.

He acknowledges that setting safety goals is one of the tougher tasks facing NRC, and speculates that the agency might take a "step-by-step approach" to accomplish it. It's possible, he says, that the agency might move toward the compromise of setting interim goals while working on permanent ones, but points out that the agency "would have to make sure that interim goals are adequate." One way to do this, he says, is "to set interim goals that are more conservative than necessary." But this approach, he admits, is likely to raise the hackles of industry, which might worry that conservative interim goals could set a trend that might prove hard to shake. On a timetable for setting goals, however, he's wary of looking into the future. "I'd hate to predict that it will happen soon," he says.

On the ethics of NRC research contracts, Palladino believes it's "definitely unethical" for an entity under threat of regulation to do research relating to that regulation. But he questions how widespread that type of contract is. He is sympathetic to giving universities contracts "on the more basic problems – those requiring more innovative thinking," adding he is aware of the criticism often leveled at university research vis-a-vis industry research – that universities have trouble meeting deadlines.

On the proper role of NRC research, he believes it mainly should be "to enable NRC to evaluate plants." It should not be used, he adds, "for the promotion of nuclear power." He wants, he says, "to set forth specific goals to gauge the progress of the commission" at one-year and five-year intervals.

On NRC's international aspects, Palladino doesn't commit himself on whether the agency should retain its export licensing duties. He wants to evaluate the situation – but whatever happens, he feels it important for NRC to be involved in safeguards aspects of nuclear power. Whoever takes the lead, NRC "can contribute," and "should stay in the picture on safeguards," Palladino says.

Although he doesn't feel NRC is directly involved in the nonproliferation aspects of Administration policy, he says, "I'm not anxious to see more countries have nuclear weapons." The International Atomic Energy Agency (IAEA), he says, ought to be effective enough so nations have confidence in it. "If they don't have confidence, then the IAEA is not effective."

Another subject he's willing to express himself on – although he points out that NRC has no say on the subject other than on licensing – is the Clinch River breeder which he feels should be completed "since so much money has been poured into it." Palladino adds that, although some people warn it isn't an effective prototype, "we can learn so much from the first one."

In addition to heading the college of engineering, Palladino is professor of nuclear engineering at Penn

[illegible] He was born Nov. 10, 1940 in Allentown, Pa. and took his masters degree in mechanical engineering at Lehigh University in 1939, later doing graduate work in nuclear engineering at the University of Illinois.

He joined Westinghouse in Philadelphia in 1950 as a steam turbine designer and remained there for [illegible] years after the U.S. Army. In 1946, Westinghouse loaned him to the Oak Ridge National Laboratories; in 1948, Westinghouse loaned him to the Argonne National Laboratory. Then in 1950 the company brought him back to Pittsburgh where as manager of the PWR design subdivision he worked on the propulsive Mark I submarine powerplant, on the reactor for the U.S.S. Nautilus, and on the Shippingport pressurized water reactor. He moved to Penn State in 1959 to head the nuclear engineering department and became dean of engineering in 1960.

Early on his list of things to do at NRC, he says, is to visit the incident response center at Bethesda a place he says, knocking on wood, he hopes will not be called into action during his term. However, that is, Palladino would play a central role in directing at least a portion of the action for accident response.

– Joanne Dann, Patricia Hattberg, State College, Pa.

COMMISSIONERS RULE ASLAB BLACKOUT DECISION HAS NO GENERIC IMPLICATIONS

An August, 1980 Atomic Safety & Licensing Appeal Board decision calling station blackout a design basis event for Florida Power & Light's St. Lucie-2 does not establish a generic guideline for the NRC staff to use in dealing with other plants, the NRC commission has ruled.

The commission decision came June 11 on a 3-1 vote with Commissioner Victor Gilinsky dissenting. In its decision last August (Inside NRC, 11 Aug. '80, 2) the ASLAB said that because of St. Lucie's location the possibility of power failure was unacceptably high, in the range of 10^{-4} to 10^{-5}. The board cited section 2.2.3 of NRC's standard review plan (SRP) as setting 10^{-7} year as the acceptable frequency of such an event.

Florida Power & Light, on the basis of the ASLAB order, was required to train operators in methods of restoring power after a station blackout, to periodically test diesel generators, and to include at least one train independent of alternating-current power in the emergency heat removal system.

The commission decision did not affect the appeal board's decision on St. Lucie. It did, however, say that the board decision "does not establish any single numerical threshold for the mandatory consideration of accident sequences." The commissioners said a plan for developing a safety goal is under way and that this effort "should provide the context for resolving the generic issue of a numerical threshold for the analysis of accident sequences," rather than a SRP figure.

The commission added, however, that "the pendency of the safety goal matter should not inhibit the boards from examining closely any accident sequence which in their judgment poses an unacceptable risk to the public health and safety."

The commission agreed with the NRC staff and the Atomic Industrial Forum. The staff contention was that if the SRP 10^{-7} probability figure were used as a guideline to determine design basis events, "such use would have a severe impact on the regulatory process because there are a large number of accident sequences with an estimated probability of occurrence exceeding one in ten million per reactor year. . . . All [illegible] of staff resources to evaluate these sequences would require substantial additional staff personnel and the net result could be an increase in risk to public health and safety."

The AIF view was that the ASLAB's use of the SRP values "as decision criteria misinterprets [illegible] staff's intent regarding the use of those values." The AIF felt the staff "intended those values to be used as screening criteria for excluding consideration of accidents involving the presence or use of hazardous materials in the vicinity of a plant."

The commission also decided the term "design basis event" in the ASLAB decision was not used [illegible] had been by the staff. "Rather, the appeal board used that term in a more general sense to denote an event which posed an unacceptably high risk to the public health and safety unless preventive or mitigative measures were taken. There is no indication . . . that the appeal board intended to go further and subject station blackout to the regulatory regime established by the staff for considering design basis events."

In his dissent, Commissioner Victor Gilinsky said the appeal board acted correctly on the St. Lucie case in establishing station blackout as a design basis event and that the board "did not intend to establish the [illegible] probability values used by the staff in certain safety reviews a mode for [illegible] status." However, Gilinsky said he felt the commission opinion "staff places unnecessary restrictions on [illegible] proceedings which [illegible] dealt with in the licensing process." He added that in referring the SRP issue [illegible] staff [illegible] of the observation that the board's judgment was "based in the future review of the St. Lucie proceeding," the opinion makes NRC's choice of accidents which must be analyzed and protected against seem almost [illegible]. The commission should [illegible] all events of safety significance [illegible] that [illegible] to a greater than [illegible] station blackout as St. Lucie should be analyzed to determine [illegible] preventive or mitigative actions are required." *– Joanne Dann*

NRC INVESTIGATES CONTAINMENT INTEGRITY BREACH AT SAN ONOFRE-1

NRC Region V staffers are investigating an incident in which a mechanical lock failure allowed both doors of an emergency hatch leading into containment to be left open during cooldown of Southern California Edison Co.'s San Onofre-1. A preliminary notification was filed with NRC on February 14, and staffers are interviewing plant personnel to determine what, if any, action will be taken, an NRC spokesman said.

The incident occured February 13 as the emergency hatch was opened when workers entered containment to balance the reactor coolant pumps, said Harold Ray, a utility vice president and site manager for San Onofre. Unit 1 had been shut down five days prior to the incident to perform a surveillance test of the safety injection system. During testing the utility determined that work was required on a safety injection system pump, located outside containment. "Because we were going to be off line longer than planned, and because of the work required on this pump, we decided to balance the reactor coolant pumps," Ray said. It was while workers were entering containment to balance the pumps that the lock failed, permitting both doors to be opened.

The problem was discovered about 21 hours after the incident occurred by an operator who was investigating the unusually lengthy time that an annunciator was on, Ray said. The open doors were not immediately discovered because the operating procedures for unlocking the emergency hatch did not require that operations personnel be present, he said.

In response to the incident, Southern California Edison has repaired the lock—replacing a gear and repairing several cams—and has rewritten the operating procedures so the lock cannot be opened without having someone from operations present, the NRC spokesman said. The utility also has trained security personnel on the new procedure, has upgraded its training program, and is evaluating the lock annunciator, he said.

Southern California Edison is still investigating the incident and has not filed a final report to the commission, Ray said. Unit 1 was expected to be back in commercial operation February 28.

—Cindy Galvin, New York