NUCLEAR REGULATORY COMMISSION

In the Matter of:

PUBLIC MEETING

SAFETY GOALS WORKSHOP

SESSION IV

DATE: May 5, 1982 PAGES: 133 thru 198

AT: Chicago, Illinois

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	1	UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION
	2	PUBLIC MEETING
	3	SAFETY GOALS WORKSHOP
	4	SESSION IV
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554-	6	Americana-Congress Hotel
202)	7	Chicago, Illinois
3.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (8	Wednesday, May 5, 1982
	9	The Public Hearing Meeting on proposed safety
	10	goals for nuclear area plants resumed at 4:00 p.m.
	11	BEFORE :
	12	DONNA SCHILLER, Moderator
	13	(Former President, League of Women Voters of Illinois
	14	Commissioner, Northeastern Illinois
	14	Executive Director, Committee on Courts
	15	and Justice.)
	16	NRC PANEL:
ET,	17	DR. FORREST REMICK
STRE	18	Director Office of Policy Evaluation:
HLL		
300	19	MR. DENNIS RATHBUN Deputy Director
Ĩ.,	20	Office of Policy Evaluation;
	21	MR. ROBERT BERNERO
		Director
	22	Division of Risk Analysis Office of Nuclear Reculatory Research
	23	Office of Mucheal Regulatory Research.
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MS. SCHILLER: Good afternoon to the law of
 you who have remained with us. I am glad to see you again.
 For those of you who weren't with us for the
 session that began at 12:00 noon, I would like to welcome
 you to this session of a hearing before three staff

members of the Nuclear Regulatory Commission. This hearing 6 has been put together and is being moderated by and has 7 been arranged by the League of Women Voters of Illinois 8 Education Fund. We heard from a great number of witnesses 9 and we have a rather smaller list to hear from this 10 afternoon. If you are not a registered speaker and wish 11 to be one, you may go to the registration desk and sign 12 up for a time slot. 13

14My name is Donna Schiller. I'm a former15President of the League of Women Voters of Illinois, and16I would like to introduce the panelists to those of17you who were not introduced before, who were not here18this morning.

On my left is Dr. Forrest J. Remick, who is the
 Director of the Office of Policy Evaluation for the NRC.

Next to him is Mr. Dennis Rathbun, the Deputy
Director of the Office of Policy Evaluation, and at my
extreme left is Mr. Robert Bernero, Director of the
Department of Risk Analysis.

Our scheduled speaker for the 4:07 time spot

is Bob Hammersley, who represents the Council on Energy 1 Independence, Oak Park, Illinois. 2 DR. HAMMERSLEY: Good afternoon. My name is 3 Bob Hammersley, and I am speaking on the behalf of the 4 Council on Energy Independence, which is a pro energy 5 group which was started in Chicago in 1975. We are pleased 6 to have an opportunity to address this forum on this 7 important issue. As with many conditions and activities 8 confronted in our society and its government, the 9 regulators of the nuclear power industry are trying to 10 formulate an answer to the question "How safe is safe 11 enough" in terms of socially conceived and accepted risk. 12 In an effort to respond to this meeting, the 13 NRC has prepared a position paper and proposed safety 14 goals, which is, of course, the intended topic for 15 discussion at this public forum. The objectives of this 16 task are rather unique and it may be a varguard of similar 17 efforts in other high technology industries. Consequently, 18 its ultimate impact on our modern society it's liable to 19 be major and so it must be done correctly this first 20

time. This task is in essence an attempt to bridge the 21 gap between societal considerations, public perception 22 and acceptance of the benefits and risks of nuclear power, 23 and technical considerations which must be addressed by 24 the regulators, designers and operators of nuclear power 25

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	1	stations.
	2	Our specific comments on the NUREG-0880 document
	3	are as follows:
	4	1. Safety goals are needed. They should be
345	5	completed and used on a trial basis.
554-2	6	2. We strongly endorse the application of
(202)	7	benefit-cost criterion given that the primary needs of
20024	8	individual and societal safety are met.
4, D.C.	9	3. The safety goal must be applied in an equitabl
NGTON	10	fashion relative to all forms of producing electrical
VASHI	11	power in order to best serve the consumer. In its current
ING, V	12	form, the safety goal does not provide a sufficiently
BUILD	13	equitable basis. It too strongly weighs the risk to
TERS	14	individuals due to prompt fatalities by selecting the
LEPOR	15	value of 1/10 of one percent of all accidental deaths
S.W., F	16	for the numerical guidelines for this safety goal.
EET, S	17	However, due to the scarcity of resources in generally
H STR	18	effecting our entire society, it is especially important
300 7T	19	that this ratio be established on a realistic and
	20	acceptable basis. This country's economic recovery as well
	21	as our current standard of living are dependent on reliable,
	22	economic electrical power. Non-cost effective safety
	23	requirements, hardware or procedures, ultimately are
	24	manifested as an economic cost to the consumer.
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Recognizing this fact it is our opinion that the 1,000 per man rem criterion suggested in the safety goal is too high and that a more appropriate value of \$100 per man rem be used instead.

A major concern with NUREG-0880 is that it 5. 5 does not include a plan for implementation of the proposed 6 safety goal. Hence, in a sense, it is premature to comment 7 on the completeness and suitability of the proposed goals. 8 The actual detailed application and interpretation of the 9 proposed safety goals could easily vary from the intended 10 ones. This could occur accidently or intentionally, 11 but in either case the actual effectiveness of the safety 12 goals could be drastically altered depending upon how 13 they are implemented. It may be prudent to review the 14 proposed safety goals once again in light of their 15 implementation plan once the plan is available. 16 The stated desire of the NRC to eventually issue the goals 17 on a trial basis may also partially address this concern. 18 Lastly, in addition to improving the 19 6.

20 coherency and consistency of nuclear power plant regulations 21 the goals are intended to improve public understanding and 22 confidence.

We submit that this intention requires a
knowledge of the public's perception of nuclear power
plant safety and more. In addition to nuclear safety it

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is also necessary to understand society's perception of 1 risk in general and its desired standard of living. 2 A strong basis for establishing an acceptable 3 level of risk should be established. This will require 4 the combined efforts of both technical and social scient-5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 ists. Caution should be exercised in determining the 6 public perception of acceptable levels of risk as this 7 perception is one of the cornerstones in the successful 8 regulation of nuclear power. Excessively restrictive 9 goals should not be used as an experiment to establish 10 acceptable levels of risk. It is CEI's belief that 11 adoption of the suggestions provided today will help 12 avoid excessively restrictive safety goals. 13 Thank you. 14 MS. SCHILLER: Thank you, Mr. Hammersley. 15 There is time enough, another two minutes if you wou'd 16 like to address the specific question to members of the 17 18 panel. DR. HAMMERSLEY: No, I don't have any specific 19 questions, but perhaps I think Mr. Bernero does. 20 MS. SCHILLER: We will ask him. Are there any 21 questions or comments, Mr. Bernero? 22 MR. BERNERO: Yes, I would like to explore your 23 comment about the lack of an implementation plan. We have 24 heard a number of comments that indicated it is difficult 25

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to judge, but you added something that interests me. 1 Are you saying that since it is apparently intende 2 to issue this on a trial basis that if the Commission 3 ruminates on it, reflects on a staff implementation plan 4 and then puts the two of them out together now on a trial 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 basis, do you think that would serve the need for the 6 ability to comment on the implementation plan? 7 DR. HAMMERSLEY: Yes, and also on the station 8 goals, because I look at both of those really being 9 available together at the same time to make an accurate 10 assessment as to what the whole process means. 11 12 Yes. MS. SCHILLER: MR. RATHBUN: You mentioned that you thought 13 that the thousand dollar per man rem of cost benefit 14 criteria should actually be a hundred. At another point 15 you indicated that you thought that the individual criterion 16 was too restrictive, but you didn't indicate what you 17 thought might be a better number than the tenth of a 18 percent proposed for individual risk. Did you have a 19 20 number in mind? DR. HAMMERSLEY: Well, I have seen some 21 discussions that indicate that perhaps one percent would 22 be a more appropriate value than a tenth of a percent, 23 but personally I don't have a strong enough basis to 24 really recommend a specific value in lieu of that at this 25

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	time.
2	MR. RATHBUN: Applicable to both criteria?
3	DR. HAMMERSLEY: Not necessarily. I think that
4	the equitability that has been discussed here and alluded
5	to by myself and discussed by others needs to help insure
6	that both individually and as a group and society as a
7	whole that the goals are equitable and that that one goal
8	doesn't predominate over the other one. That's really
9	where my comment is being addressed to.
10	MR. SCHILLER: Thank you very much, Mr. Hammersley
11	for your statement and answers to our questions.
12	Due to a number of factors I'm going to be
13	rather flexible with this afternoon's schedule, and one
14	reason is the delightful weather in this room, and I am
15	going to try and expedite the rest of this hearing just
16	as guickly as I can, so that if possible we will finish
17	before schedule
18	Now the next meaker use seved up to an
19	now, the next speaker was moved up to an
	earlier time slot. That was George Stanford from Argonne.
20	Therefore, even though it's a few minutes early for the
21	next presentation, I would hope this person is in the
22	audience. Please let me know if you are here, and I'm
23	referring to Dr. Evelyn Tyner.
24	Yes, Dr. Tyner, if you would make your present-

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ation now, that would be fine.

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1 Dr. Tyner is speaking as a concerned citizen. 2 DR. TYNER: I would like to thank you and commend 3 the NRC and its members here for opening this meeting to 4 the public, and I'm only sorry the room isn't filled. 5 It is a difficult thing to get yourself together and 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 address issues of this importance, but we would certainly 6 hope that in the future we may have similar meetings on 7 8 things like cool storage, the complete /cycle, the permanent 9 waste storage proposals, et cetera, and I urge you to 10 give us another chance on some of these matters. 11 I heartily agree with the concept of defense 12 in depth, that if one system fails another takes over, 13 at cetera and NUREG-0880, I did not see any reference in the final defense of this sort that would involve the 14 15 citizens themselves, and I am speaking specifically of availability of potassium iodide tablets, which 16 the 17 have been approved by the FDA for use in case of nuclear 18 That would include radioactive iodine, and emissions. 19 I am wondering and I will phrase this as a question to 20 be answered later, what policies might be addressed with 21 respect to this. 22 I have spoken to some of my students about it 23 and they would be happy to have in their own medicine 24 cabinets a supply to be taken in case of immediate

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25 emergency. I wonder about both availability, distribution,

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getting people informed about if these are ever going to 1 be used, but particularly who makes the decision. 2 Now, this is way down the line in our defense 3 in depth concept, but I suggest that the KI tablets should 4 be looked at and the issue addressed to some extent. 5 STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 Obviously, there are a number of both generic and specific 6 problems. 7 Research has been done on many and most of these, 8 but I understand there are still a great number of what 9 are usually called unresolved safety issues. It seems to 10 me that an appropriate area for NUREG-0880 or the next 11 succeeding thing to address would be the suggestion that 12 we should look at these unresolved problems and no matter 13 14 what the cost -- there was some cost benefit analysis with respect to this -- attempt to solve them as part of 15 our general and ongoing wish to identify hazards and 16 minimize their effects and so on. 17 18 300 7TH 19 20 21 22 23 24 25

2/3/1 143 so on LLdk Now, of course, our nearby Dresden is one of 1 the early reactors and its lifetime will be ended within 2 the decade and obviously new problems will arise as the 3 materials age. We already had much information about 4 embrittlement problems and also the not nuclear, but 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 related steam generator tube leakage, and I suggest 5 7 these are only two of possible problems that will be exacerbated as the time of the lifetime is reaching its 8 9 end. So I would suggest that we, you be alert to 10 possible changes and not wait to have the analysis 11 provided to spend the dollars for the older plants even 12 though it couldn't be amortized over the lifetime very 13 14 effectively. 15 Alternatives others have mentioned are not merely coal. If we implemented conservation policies, 16 many others suggested we could save 30 to 40 percent of 17 the energy which we now use, and whereas nuclear is only 18 3 to 4 percent of that it would make a much bigger 19 difference and minimize some of the problems that we are 20 21 addressing today. One way to keep the risks low -- I don't know 22 if this has been suggested by previous speakers -- would 23 be to require the companies to foot their bills for 24 insuring the risks, in other words, not to accept the 25

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Government's handouts that the Price-Anderson Act gives the insurance coverage, is a governmental subsidy to the nuclear industry, and I would think that the industry itself would attempt to keep the risks low by, if they had to pay the complete costs of their own insurance coverage, and that would perhaps take a lot out of the hands of us who are trying to figure out what would be the best way to keep the risks low.

MS. SCHILLER: Dr. Tyner, you have an additional two minutes. You did say you would pose a question.

DR. TYNER: The question is about the KI tablet What are the policies at the moment and -- I realize it would be a tremendous problem to distribute then and some people wouldn't understand, they might take them like vitamins, but what do you think?

16 MR. BERNERO: I would like to speak to the 17 question of the potassium iodide tablets or solutions. 18 Sometimes it is proposed to be in a liquid form too. 19 This has been a continuing question for quite a few 20 years, and the basic issue is is it worthwhile to dis-21 tribute potassium iodide tablets in advance. For those 22 of you who are not familiar with it, the radioactive 23 iodine that might come out of a nuclear reactor accident 24 would attack your body, principally your thyroid gland, 25 by absorption of the thyroid gland. If you took a

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couple of tablets of potassium iodide you would saturate your thyroid gland with neutral iodine, that is, nonradioactive iodine, leaving no space, so to speak, for the radioactive iodine. That's how it would work. It is a blocking agent.

. . . 145

The questions that are raised whenever one considers that are in three general areas.

One is, you alluded to, how can you distribute them and how can you be sure that the people would have them so that a radio broadcast from the Governor saying "Take your potassium iodide tablets" would be effective, and it raises a question of putting them in plastic bags on the electric meter and things like that, and there are problems then if someone doesn't have a tablet.

If one of the kids took the bag off the meter, would that inspire panic in that person to say, "I'm going to die unless I have that tablet." A lot of distribution problems exist.

There is a second question and that is you're taking a bulk quantity of a chemical which can have side effects, just ordinary chemical side effects, and even today there is medical argument as to whether the chemical side effects associated with potassium iodide are a greater risk than the suppression of radioactive risk and that's -- the American Endocrine Society --

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the thyroid is an endocrine gland -- has debated that issue for quite some time, and the NRC hasn't seen a concensus out of that, and then lastly we have a question unique to nuclear technology.

For years we had said that if you want to have a fair measure of a nuclear reactor accident release you can use the radioiodine and right now most scientific opinion is saying that we are probably substantially overestimating radioidine releases against other radionuclides.

11 All in all it puts us in a position when we 12 look at the evaluation of all the factors, the NRC doesn't 13 see a pattern that makes it worthwhile, and that's why it hasn't been done. It is obviously not forbidden in 14 15 our practices. There are potassium iodide supplies for emergency workers where it does have a little bit more 16 worthwhile character and you may realize that the State 17 of Tennessee recently distributed some potassium iodide 18 around the Sequoia Plant. But it is a very tough call 19 to say whether that's worthwhile, and as of this point 20 21 there just doesn't seem to us to be a persuasive case 22 to do it. 23 DR. TYNER: Just consider it.

24 MS. SCHILLER: Thank you very much.

25 Thank you, Doctor.

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Dr.

I know the next speaker is here because I saw
 her come in, Sheila Sachnoff from the League of Women Voters
 of Chicago.

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MS. SACHNOFF: On behalf of the League of Women 4 Voters of Chicago, I wish to thank you for this opportunity 5 of appearing before you today. The League has long been 6 an advocate of full public participation at all levels of 7 government especially with respect to the formulation of 8 regulations by regulatory agencies. It is essential that 9 public participation in these matters not be abridged. 10 This forum is very much in keeping with the League position. 11

12 The Nuclear Safety Goal issue before us today 13 is of vital concern to the Chicago League. As Chicagoans, 14 we feel particularly vulnerable to whatever risks may be 15 inherent in the nuclear reactor program, because we are 16 literally surrounded by reactors and waste disposal sites.

I was glad to see some acknowledgment - in the discussion paper NUREG-0880, that the question "How safe is safe enough" is a social and ethical as well as scientific consideration. Acceptable risk must always be a matter for intense public scrutiny and input.

To this end it is essential that the public as well as the technicians be kept well-informed and paramount that they not be misinformed whether by design or error. We are concerned that the use of numerical

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guidelines as detailed in the discussion paper may be a 1 source of such misinformation. Disclaimers in the paper 2 notwithstanding, guidelines are often interpreted to mean 3 standards or levels of acceptability in the public mind. 4 Therefore, one can easily be seduced into a false sense 5 of security if told that a particular guideline has been 6 7 met. Furthermore, can it be denied that it might on 8 occasion be politically expedient to allow such inter-9 pretations to stand? 10 As the discussion paper repeatedly acknowledges, 11 none of these suggested numerical measurements can, 12 if met, assure safety. There are far too many unknowns, 13 and in most cases the empirical evidence required to 14 complete the equations would be unthinkable. 15 The one numerical assumption that has been widely 16 promulgated is that the probability of the worse case, a 17 core meltdown, is infinitesimal. The discussion paper 18 does not disavow this assumption, but, in fact, tends to 19 20 lean on it. Nevertheless, findings concerning the brittlness 21 of metals in existing reactors has led some experts to 22 believe that the probability of such an occurrence is 23 far greater than has been supposed. 24 We do not know which assumption is correct. 25

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 Nevertheless, if I had a revolver with an infinite number
 of chambers and a single shell, I still would not place of
 it to my head and pull the trigger because/the catastrophic
 effect should that one chance come to pass.

This suggests that the qualitative goals, which . 5 must be set, should proceed not from a train of thought that 6 says "This almost certanly will never happen," but from 7 an attitude which states that without due diligence. 8 this probably will happen some time in some place. 9 So what measures must we take to better protect 10 the vulnerable if the event does occur? This brings us 11 to a qualitative goal that is significant by its absence 12 from the discussion paper, that no nuclear plant be 13 located within 50 miles of a densely populated area. 14 The discussion paper devotes a good deal of 15 space to the protection, sheltering and evacuation of 16

17 persons within one mile, ten miles and 50 miles of a 18 reactor.

19 It also spends much time in citing statistics 20 about the average populations at each of these intervals. 21 Such averages are meaningless, as illustrated by that 22 old chestnut about a man who drowned in a river with an 23 average depth of four inches.

It appears that in the morass of statistics one loses sight of an important and realistic goal, the

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judicious siting of nuclear power plants. 1 In arriving at appropriate criteria for density, 2 you might consider such statistics as used by the census 3 in defining an urban place. However, we can envision 4 no reasonable criterion which should have permitted a 5 nuclear power plant to have been built at Zion. 6 Zion is 46 miles from Chicago. How would you shelter and/or 7 evacuate the population of Chicago? 8 Between Zion and Chicago are populous, suburbs 9 of Illinois. Within 50 miles north of Zion are population 10 centers of Wisconsin. Furthermore, Zion is located on 11 Lake Michigan. What reasonable qualitative safety goals 12 would allow a nuclear power plant to be located at the 13 source of drinking water of millions of people. 14 15 16 17 18 19 20 21 22 23 24

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eople Nuclear power is a relatively new industry. Much 1 is still unknown. Numerical record keeping of the kind 2 described in the discussion paper should not be denigrated. 3 It may be extremely valuable as data and as a source of 4 intelligence in identifying potential problems. These 5 20024 (202) 554-2345 data as well as technological breakthroughs may be 6 expected, in fact, to lead to greater safety. When such 7 problems are identified and solutions become available, 8 they should be applied throughout the industry. Retro-9

> 10 fitting should be standard in this industry. Safety 11 standards should allow for nothing less than the safest 12 available operation.

Finally, the public will not feel safe, and in 13 fact will not be safe until it can be assured that the 14 nuclear industry and the Nuclear Regulatory Commission 15 have an overriding commitment to safety. Unfortunately, 16 in Illinois and elsewhere the track records inspire no 17 such confidence. There can be no such question that 18 failure to pursue reports of valve problems elsewhere 19 contributed to the accident at Three Mile Island. 20 Handling of the discovery of damaged tubes in several 21 reactors has been less than exemplary. 22

23 Perhaps in addition to goals, this Committee
24 should consider sanctions. For both the industry and
25 regulatory personnel, the cost of failure to pursue

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1	1	viclations of safety requirements and procedures must be
	2	greater than the cost of doing sc.
	3	Thank you vary much.
	3	MS. SCHILLER: Would you like to pose a specific
	-	question to one of the panelists?
4-2345	,	MS. SACHNOFF: NO.
2) 55	0	No. couttien. No there any questions or comments
24 (20	7	MS. SCHILLER: Are there any questions of comments
2002	8	on Miss Sachnoff's testimony?
l, D.C	9	(No response.)
GTON	10	MS. SCHILLER: Thank you very much.
ASHIN	11	The next speaker, and I see her here too, is
NG, W	12	Evelyn Cheslow, a concerned citizen of Glencoe, Illinois.
ULLDI	13	MRS. CHESLOW: May I sit?
ERS B	14	MS. SCHILLER: You certainly may. That's why
SPORT	15	it's there.
W. , R!	16	MRS. CHESLOW: I will have copies for the panel
ET, S.	17	and the court reporter.
STRE	18	At the outset I will in honesty stipulate that
00 7TTH	19	I believe the task you face is illusory and ephemeral,
30	20	however deep your sincerity and determination may be.
	21	You suggest that you will quantify risk in an
	22	industry whose history of accidents is like a history
	23	of unexpected malfunctions. Even the stuck valve at
	24	Three Mile Island, reported as a potential troublemaker,
	25	led when ignored, to a totally unpredicted series of

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events culminating in a disaster of major proportions,
 one hour short of meltdown.

Furthermore, what credibility can we place in
a safety goal enunciated by an agency in whose lexicon
the Three Mile Island accident was not an ENO, an
extraordinary nuclear occurrence?

If TMI was not an ENO, then that ruling was 7 certainly a DES, a display of extraordinary semantics. 8 Because that decision forces all of the injured parties 9 into protracted, costly lawsuits to establish their right 10 to compensation for damages. Thus they are stripped of 11 the single slender protection the public might expect 12 from the so-called "No Fault" provision of the Price-13 Anderson Act. We'll get back to Price-Anderson directly, 14 but having told you why I don't want Nuclear Regulatory 15 Commission semanticists to articulate the dangers I 16 face from nuclear, let me explain why I don't rejoice 17 in having NRC statisticians to quantify those dangers 18 19 for me.

One organization I belong to wrote to the NRC to find out that four nuclear reactors on Lake Michigan are of the class now known to be subject to embrittlement damage, far in advance of the design projections. The Commission replied that given the lower level of probability that any one of these would rupture, it is of scant concern

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1	that we have four of these on our lake.
2	But whether the NRC admits it or not, low levels
3	of probability, when added within a given context, total
4	a higher level of probability.
5 342	Are you going to use the same devil-may-care
9 554-2	brand of mathematics to quantify risks for us? I'm not
(202) 2	Einstein, but I won't buy it, and I bet that the people
8 2002	on the four states bordering on Lake Michigan and the
4, D.C.	other states and Canadian provinces on connecting waterways
10 10	won't buy it either.
IHS 11	There are numerous inequities in the Price-
19NI	Anderson Act, but shielding from liability an industry
13	which is based on the most precarious technology so far know
SW31	to mankind has positioned the nuclear industry as the
NO13	biggest welfare ripoff ever committed in the United States,
. 16	geometrically greater than price-supported subsidies to
17 17	any other industry you can name.
IS IS	You want quantifiable probabilistic risks? Assure
19	Congress that it can repeal the Price-Anderson Act and
20	let the irsurance industry do what comes naturally.
21	If President Reagan and the NRC are so sure
22	that nuclear power is the way to go, the only path to
23	credibility is to let it meet the test of the marketplace
24	by assuming responsibility for its own risk and liability
25	for the dangers it poses to all in its ambit.
	Thank you.

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1 MS. SCHILLER: Thank you very much, Mrs. Cheslow. you. 2 Would you like to pose a question to one of the panelists? 3 MS. CHESLOW: I do, as a matter of fact, have 4 three questions for the panel, which may seem to be 5 "hetorical, but I want to assure you that they are indeed 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 6 serious questions. I will give you copies, but I implore 7 answers either now from the floor or in written form after-8 ward. 9 I would like to read the three. 10 MS. SCHILLER: You have two minutes. 11 MS. CHESLOW: Okay. 12 What meaning will any other number have when there 13 is no finite number which can be computed for the allure 14 to terrorists of nuclear plants themselves as well as the 15 weapons grade end products of reprocessing plants? I can 16 understand your choosing to ignore it, but that makes all 17 the rest of the exercise quite meaningless. 18 Even -- and this is the second question -- even 19 if it were possible to credibly quantify risks when 20 postulating operation of plants with sober and diligent 21 personnel subject only to normal human error, how can you 22 possibly expect to factor in the exponentially increased 23 risk of staff and supervisors who injest drugs and alcohol 24 while on duty, as has been found to be the case at at 25 least two plants in Illinois and maybe assumed therefor

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	1	to be the case in some other plants across the country, and
554-2345	2	three, even if it were the only question to which you
	3	addressed yourselves, do you believe that you can quantify
	4	the risks of contamination forward into the future genera-
	5	tion to whom we leave a massive legacy of radioactive
	6	garbage even if every nuclear plant were to shut down
(202)	7	tomorrow? What experience do we have to allow us to
20024	8	predict its undegraded containment for thousands of years?
D.C.	9	How do you anticipate the permanent integrity of any
IGTON	10	tagging or labeling system we may devise?
NG, WASHIN	11	I see that I have one more minute. May I throw
	12	in one paragraph of addendum?
IULIDI	13	MS. SCHILLER: As long as you don't expect an
PORTERS BU	14	answer.
	15	MS. CHESLOW: I'm perfectly willing to have a
W. , RI	16	written answer.
ET, S.	17	If the not-clean, not-safe, not cheap nuclear
STRE	18	industry had not been our biggest A.D.C., Aid to Dependent
HTT 00	19	Children, recipient over the last 25 years, we could have
30	20	given reasonable and deserved support for research and
	21	development of the renewable forms of energy, coupled with
	22	conservation incentives and education.
	23	We should do so now.
	24	Thank you.
	25	MS. SCHILLER: Thank you very much for your

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	1	excellent questions.
	2	Can we expect Mrs. Cheslow will receive
	3	MRS. CHESLOW: Each of the panel may have a copy,
	4	but they are serious questions.
2345	5	MS. SCHILLER: Will she be able to expect will
() 554-	6	the NRC be able to reply?
24 (202	7	MR. REMICK: We have not made a commitment to
2. 2002	8	answer individual questions from the public in writing,
N, D.C	9	from all the public media.
INGTO	10	MS. CHESLOW: If you ponder them, that's all I
WASH	11	ask.
DING.	12	MS. SCHILLER: They are on the record, Ms.
BUILI	13	Cheslow.
TERS	14	MS. CHESLOW: Thank you very much.
REPOI	15	MS. SCHILLER: Is Mr. Dave Kraft in the room?
s.w.	16	MR. KRAFT: Yes.
REET,	17	MS. SCHILLER: I am glad that you are because
TR ST	18	we would like to hear from you now.
300 7	19	Dave Kraft is representing the Nuclear Energy
	20	Information Service, and he is from Chicago.
	21	MR. KRAFT: Given that we only have four minutes
	22	apiece, my only purpose here today is to raise some general
	23	comments we would like to address in the NRC. We will be
	24	submitting a written report prior to the May 18th deadline,
	25	and we would like to have a response to that.

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In looking over the NUREG-0880, the first thing 1 that comes to mind is that while it is really commendable 2 that the NRC is addressing the issue of safety at nuclear 3 power plants, one of the things that we find is that 4 broad safety goals sometimes propose the illusion of 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 safety at the expense of actual policy and regulation within 6 the industry, and I think some of these issues were 7 addressed by Commissioner Willinsky himself in the report 8 9 and his statements there. We would urge that any goals that would be 10 adopted would be substantive and not vague and general. 11 The notion of having public hearings also promotes a false 12 sense of security in thinking that the NRC is handling the 13 safety issues when in fact the broadness of the goals : 14 15 intended may not do that. Specifically, some points that we wanted to raise 16 the first being that it really did distress us that cer-17 tain aspects were left out of the hearings, particularly 18 the entire nuclear fuel cycle and the risk from routine 19 emissions at power plants, as well as was indicated in 20 on the report the sabotage and nuclear material issue. 21 The fact that the nuclear fuel cycle was left 22 out of these hearings still leaves probably the dirtiest 23 part of the nuclear industry left without any kind of 24 guidelines or goals that the NRC can address itself to, 25 and again this gets back to the issue of a false sense of security as a result of the hearings. ALDERSON REPORTING COMPANY, INC.

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In terms of numerical guidelines, and what's stated in the report, and I quote: "Any fatal accident or cause of conduct posing an acceptable risk at one moment results in acceptable death moments later."

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This is true whether one speaks of driving, 5 flying or generating electricity from coal. While this 6 may be the case, the one thing that is left out of that 7 statement is that after an accident at an airport or 8 driving accident the fatality stops and one very serious 9 issue that the report fails to deal with is the issue of 10 mutagenic capabilities in the population and the nuclear 11 12 power plants as a result of an accident.

While the report takes into account cancer
fatalities and deaths, there is nothing in the report that
addresses itself to the mutagenic capabilities of radionuclides which would be released from the plant.

17 This is serious not only for the immediate 18 generations, but for future generations to come, since 19 it takes several generations because mutations express 20 themselves in the gene pool.

It also distresses us that you only restricted your comment to forms of generating electricity, and if you are concerned with safety we urge you to adopt some guidelines with the utilities that they show that not only by generating electricity can they justify the use of

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nuclear power, but that they take into consideration con-1 servation as a viable alternative and prove beyond a shadow 2 3 of a doubt that nuclear power would be preferable to con-4 servation measures which could be implemented in the areas 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 around nuclear power plants. 6 I'm going to stop there. I do have other com-7 I see the one minute sign. The only question I ments. 8 would raise, and I would like an answer to, is is it the 9 intention of the NRC to include at some point within this report something which addresses the issues of the effects 10 11 on the gene pool through mutagens of radionuclides. 12 MS SCHILLER: Thank you, Mr. Kraft. 13 Would you like to address a specific question? 14 MR. KRAFT: I just did. 15 MS. SCHILLER: Is there a comment? Mr. Bernero. 16 MR. BERNERO: I was just asking Mr. Rathbun, I 17 thought we had a discussion in there somewhere that was 18 considering mutagenic effects or genetic defects that 19 result from accidents. 20 In general they are or are projected to be 21 proportional to the latent cancer effects, that as latent

cancer effects go up, so would the genetic effects, and 23 somewhere in there I thought we said that rather than 24 have two parallel goal structures, we would use the 25 latent cancer effect, taking into mental account that it

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	1	is a surrogate for genetic effect as well.
	2	MR. KRAFT: So are you saying that it is included
	3	in the figure that is stated there?
	4	MR. BERNERO: Yes, that is implicit in it, and
2345	5	I thought we had a discussion in there.
) 554-2	6	MR. RATHBUN: There is a discussion on pages 14
4 (202	7	and 15 of that subject.
2002	8	MR. KRAFT: Okay, thank you.
N, D.C	9	MS. SCHILLER: Thank you very much.
INGTO	10	Is Mr. Richard Mandel in the room?
WASHI	11	(No response.)
, DNIG	12	MS. SCHILLER: All right, he is not scheduled
BUILI	13	to speak for a few minutes yet, so I think I will proceed
TERS	14	and we will come back to him.
REPOF	15	Mr. Eugene Voiland, GE Manager of Morris Operation
S.W.	16	Morris, Illinois.
REET,	17	MR. VOILAND: I would like to comment but I'm
TH ST	18	really speaking for myself at the present time. The
300 7	19	General Electric Company may or may not agree with me
	20	on what I say.
	21	I guess first of all I don't really believe that
	22	the safety goals will ensure improved safety for the
	23	reactors. I guess my conviction is that the in-place
	24	regulations that we have are very adequate. The real
	25	safety comes from good design of facilities. It comes

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from good construction, good fabrication. It comes from 1 good quality control. It comes from good procedures and 2 good operation, and by and large I believe that what the 3 NRC has done has provided us a good degree of safety. 4 Despite Three Mile Island, which, of course, was, as someboo 5 mentioned, a disaster, it was an economic disaster and a 6 very difficult problem for industry. It was not in any 7 sense a problem as far as the safety of the people was 8 9 concerned. 10 So I really believe that the performance has demonstrated that what we have is good. I guess I view 11 the hope of the safety goals as being an application which 12 would ensure that future activities relative to these 13

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14 plants, the retrofitting of facilities, the establishment 15 of new regulations and the cost of those regulations can 16 be done on a more rational basis than it's been done in 17 the past.

If one examines carefully the lessons learned 18 from Three Mile Island, you will find very many things 19 were proposed for the industry to do. Some were trivial 20 and expensive, some were not trivial and not expensive, 21 and some were not trivial and expensive, but there seemed 22 to be no sorting process, and I would hope that these 23 goals would try to do that, and as somebody else mentioned, 24 25 define how safe is safe.

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1	The whole world, of course, is at risk all the
2	time and there is nothing that we do that is risk free.
3	Since the day of birth it is all downhill.
4	What I would ask the NRC to do is to review the
5	risk probabilities. When I looked at those it looked to
6	me like the fatality risk probability is something less
7	than one per million per year. That is one fatality per
8	year.
9	The one-tenth percent is applied on restrictive
10	population and so on, and when I look at that in terms of
11	other risk that we accept all the time, I don't believe,
12	for example, that the coal steam, that producing electricity
13	by coal would meet that kind of a standard, and when I
14	think of the billion dollars a year that we spend for
15	the indemnity of people that have black lung disease,
16	for example, or the fact that we have 200 deaths per
17	million as a result of automobiles, so I think that what-
18	ever numerical standard comes up should be considered
19	fairly carefully.

And I would also say in terms of cost per man rem that that ought to be considered, reconsidered, and I'm just asking you to do that because I don't know what the good answers are for that, but I do know this, we have people that work with radioactivity all the time and if you said you were going to hire those people to accept a

man rem for a thousand dollars, you would have every person in our plant including me lining up to do that, with that, but that is, I think there needs to be some reconsideration of that. I would ask only one question and that is do 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 you perceive that these safety goals will have much impact upon the safety of the nuclear reactors at this point in time? MS. SCHILLER: Thank you. Who would like to answer that question?

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1 MR. REMICK: I don't -- I have to agree with you ueston? 2 that perhaps they will not change the safety. They did provide a proposed criterion to judge how safe is safe 3 enough from the standpoint of accidents, and that could 4 5 be used then as a criterion using risk assessments and 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345

6 so forth to determine if plants meet that criterion. So it is an attempt to define a level of safety 7 that perhaps the public would accept as safe enough. That 8 9 is the primary purpose, and to enable the staff implementing 10 the Commission's rules and regulations to have some 11 guidance then in making decisions.

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12 MR. VOILAND: I would hope that it would have that kind of applicability. If it doesn't, it is sort of a 13 14 useless exercise.

15 MR. REMICK: Now, at the same time, if this were implemented and let's say that it was accepted and 10 17 implemented in some form and plants were found not to meet it, then it might lead to decisions that could 18 indirectly result in improvement of safety of those plants 19 20 if they found they did not need it.

Those are hypothetical, but I can see in that 21 indirect way it might affect safety. But this document 22 itself or the numbers would not change safety itself. 23 MR. VOILAND: Would the plan to have this type 24 of analysis done, say, hydroelectric power, for coal 25

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1 steam power, or anything else that we have in mind, solar 2 energy or what-have-you?

MR. REMICK: I do not believe by the Nuclear Regulatory Commission because it is not involved in regulating those. I don't know if you were here earlier when I mentioned that I'm aware of a bill that is proposed before Congress by Congressman Ritter which would replace some of these requirements on a number of federal agencies involved in regulations including NRC to do this type of thing equivalent to a safety goal or assessing the risks of various technologies.

If that was implemented, perhaps that would result in the type of thing that you're asking for in other technologies. Of course, I am sure you are aware there are a number of studies and reports that have been done by individuals or groups in the past. Not all of those results are acceptable by everybody.

18 MR. VOILAND: That's right. Low probability 19 events are very difficult to quantify. There is no 20 question about that.

21 MR. BERNERO: I would like to offer what could 22 be interpreted as a differing view to Dr. Remick's 23 answer on will these safety goals or guidelines improve 24 reactor safety.

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I telegraph some of the sentiments that exist

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2 they will have a substantial effect on reactor safety 3 because by their very existence they will prompt people 4 to look at reactors for loopholes in the design, for 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 weaknesses previously unnoticed, and use this supplementary 6 method of analyzing safety. 7 I'll be the first one to admit you can't replace 8 conventional safety analysis with this numerical risk 9 analysis, but it is valuable as a supplement, and I think 10 an industry-wide tendency to use it is already underway. 11 It provides a very good insight into loopholes 12 in the reactor designs that may have not been noticed. 13 It is an excellent tool to train operators on what might 14 happen and make them much more competent to respond to 15 real accidents. 16 So I think overall it will, just the existence 17 of the goals will improve safety. 18 MS. SCHILLER: Thank you very much. 19 DR. REMICK: I might just add that I agree with 20 Mr. Bernero. When I was making my statement I was refer-21 ring to a setting of a goal number and not referring to 22 probablistic risk assessment.as a technique. 23 MS. SCHILLER: Thank you very much, Mr. Voiland. 24 Has Mr. Richard Mandel arrived? 25 (No response.)

in the regulatory staff when I say these things. I think

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1 MS. SCHILLER: If not, I will ask if Mr. Ernest 2 Cheslow is in the room. 3 Mr. Cheslow is a concerned citizen. 4 MR. CHESLOW: I respectfully request that the 5 Nuclear Regulatory Commission abandon its attempt to define 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 6 acceptable risk on a numerical basis. The attempt is an 7 exercise in futility at best and an excercise in deception 8 at worse. 9 The risks of nuclear power generation are not 10 quantifiable at the present state of knowledge, or for 11 that matter in the foreseeable future. The NUREG-0880 12 report admits this when it limits its safety goal to 13 omit risks from sabotage. 14 It is understandable that the authors of the 15 report would want to avoid the prickly question of 16 sabotage because it is so obviously unquantifiable, but 17 sabotage does not disappear when it is ignored. In 18 today's climate of institutionalized terrorism, sabotage 19 is too large a portion of the total risk to be ignored. 20 One might just as well try to assess the dangers of fire 21 losses while ignoring arson. Any insurance company that 22 did that would quickly go broke. 23 I would like to talk briefly about insurance 24 companies. The most reliable risk quantifiers are those 25 whose livelihood and survival are dependent on their

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In 1957 the insurance industry was asked by the 3 AEC to estimate the likelihood and the expected conse-4 quences of a major nuclear accident and declined to do so, 5 saying that there were insufficient data. Twenty-five 6 years have passed and about 70 plants have been licensed 7 and there are still insufficient data for the insurance 8 companies to come up with an estimate of risk good enough 9 10 to risk their own money.

As recently as 1979, the insurance industry reported to the National Association of Insurance Commissioners that it could not write insurance for the public to protect itself from the consequences of a nuclear disaster because it could not estimate the risk.

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-9rtl If the insurance industry is passing up the 1 potential profits that could be obtained from insuring the 2 public against nuclear accident, it is only because it 3 has no confidence that its best guesstimates of the risk 4 can be close to what the actual risks may be. What makes 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 the NRC think that it can get more reliable risk estimates 6 than those available to the insurance industry? 7 The most quoted quantification of nuclear risk 8 available to the public is WASH-1400, the Rasmussen Report 9 The NRC has withdrawn its support of the of 1975. 10 Rasmussen Report as well it should. 11 The Rasmussen Report itself admits that its 12 central estimates of a predicated 0.024 death per reactor 13 year could be five times too low or five times too high 14 at a 90 percent confidence level. 15 An article in Technology Review in April, 1982 16

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states that the correct expectation value of loss of 17 life could be anywhere from 100 times smaller to 1,000 18 times larger than the central estimate, a range in which 19 the maximum is 100,000 times greater than the minimum. 20

If I were to tell my wife that my income next 21 year will be somewhere in the range of ten to one million 22 dollars, she would have no reason to doubt the accuracy 23 of my statement. But how useful would it be to her in 24 terms of knowing which expenditures are acceptable and 25

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	1	which are not?
	2	I submit that any attempt by the NRC to assess
	3	the acceptability of risk on the basis of such will-o-the-
	4	wisp risk estimates would be as useless as running a
2345	5	family budget or a business on the basis of an income estimat
() 554-:	6	that can vary a hundred thousandfold.
14 (202	7	Just because we're dealing with a technological
2002	8	problem does not mean that we should abandon common sense.
N, D.(9	MS. SCHILLER: Mr. Cheslow, your time is up.
1 INCLU	0	MR. CHESLOW: Thank you.
MASH	1	MS. SCHILLER: Would you like to address a
DING.	2	specific question?
BUIL	3	MR. CHESLOW: I have no specific questions.
I RTERS	4	If anybody has any questions of me, I'll be glad to answer
I NEFO	5	them.
· 1	6	MS. SCHILLER: Are there any comments?
193N	7	Mr. Bernero?
	8	MR. BERNERO: I would like to make just one
000	9	comment. If I heard you correctly, you said the NRC
2	20	has withdrawn its support from WASH-1400. I think it
2	1	would be more accurate to say that the NRC has withdrawn
2	22	its support from the summary that was presented with
2	3	WASH-1400. The Lewis Committee, which was appointed after
2	4	that reactor safety study, evaluated the report very
-		deeply and put out a separate report endorsing some of

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the material in the reactor safety study, but among other 1 things pointing out the very issue you do, that the 2 uncertainties are larger than presented and that executive 3 summary of the report, which was disavowed, was guilty 4 5 of that sin. It inaccurately presented the uncertainties. 6 MR. CHESLOW: I would like to suggest, sir, 7 that the basic premise of the report that there is a 8 probability tree and that we can multiply the probabilities 9 in a sequence of events was proved to be wrong at Browns 10 Ferry, where a candle used to detect leaks ignited the 11 ignition on wires and suddenly a number of instruments 12 along the tree were put out of commission at the same 13 time by the same incident. 14 MS. SCHILLER: Thank you very much, Mr. Cheslow, 15 for your statement. 16 I see that Mr. Mandell has arrived and we will 17 now take your statement, Mr. Mandell. 18 Mr. Mandell is representing himself as a 19 concerned citizen. 20 MR. MANDELL: That is correct. I am here not 21 as a technical expert, and I have no intention to discuss 22 the things that Mr. Cheslow or I'm sure many other people 23 have or will discuss as far as the techical matters, 24 but I think Mr. Cheslow hit the one item that I'm most 25 concerned with, and that's uncertainty.

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There is so much uncertainty over the safety factors that it is imperative that the Nuclear Regulatory 2 Commission think hard before they relax anything at all 3 and do anything than have the most strict safety require-4 5 ments. What kind of a risk is acceptable? I say no 6 risk is acceptable unless you know very well what the 7 risk is, and none of the experts have been able to 8 say with any accuracy what the risk is. 9 So I think what we have to think is what is the 10 rationale for going into scmething that is uncertain, and 11 we have to look at the need, the idea of the cost and 12 what is the benefits, the cost benefit theory. Before 13 you can even go to cost-benefit theory you have to think 14 15 of the need. What is the need for nuclear power today? 16 What are the alternatives, before we take this risk. 17 I think we have to think of the one alternative that 18 I think is most important and that is conservation, 19 and if we take one industry alone, the aluminum industry, 20 which is probably the single highest user of energy in 21 the country per the amount of use for an industry and we 22 think of the disposable aluminum pans that are used by 23 the aluminum industry, that are produced, and if we would 24 eliminate that would there be any need for worrying 25

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about this uncertain risk. It has been estimated that approximately ten percent of the energy use in this country is in the

4 aluminum industry and a great portion of it in the
5 throwaway cans. If that alone was eliminated, this is
6 only one, I think, concrete example of conservation,
7 would there be a need to jump in where we don't know.
8 Would there be a need for this kind of uncertainty.

9 And I think if we think of is there a need,
10 the most basic question, is there a need for us to do
11 this, I think the answer is going to be no, or at least
12 the answer will be only with a known amount of risk that
13 is acceptable, and the risk that we know of, the uncertainty
14 I don't think at least in the foreseeable future we can
15 come up with that.

I have been identified in the city with other 16 kinds of causes, primarily juvenile causes. I'm a member 17 of the Illinois Commission on Children. I have been 18 involved in testifying in legislative commissions, and 19 20 if I went before a legislative commission proposing some kind of legislation with the amount of uncertainty 21 that there is in this field, I could never appear again 22 23 and testify.

24 We don't know what we are doing and we do
25 know that there are other ways to overcome it, conservation.

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	1		Than	nk you.						
	2		MS.	SCHILLER:	Thank yo	ou, Mr	. Mar	dell.	Wou	ıld you
	3	care to a	ddres	ss a specif	ic quest:	ion to	any	of th	e par	elists
	4		MR.	MANDELL:	No, I wou	uld no	t.			
345	5		MS.	SCHILLER:	Are then	re any	ques	tions	ord	comments
554-2	6	to Mr. Man	ndell	.?						
(202)	7	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	(No	response.)			141			12.6.6
20024	8		MS.	SCHILLER:	If not,	thank	you	very	much	for
4, D.C.	9	appearing	here	today.					alt in id	
10 10	10									1447
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today		
	1	Is Bridget Rorem in the room?
	2	MRS. ROREM: Yes, I am.
	3	MS. SCHILLER: If you are ready, we would like
	4	to have your testimony now.
345	5	Bridget Rorem is representing Illinois Friends
554-2	6	of the Earth from Essex, Illinois.
(202)	7	MRS. ROREM: My name is Bridget Little Rorem and
20024	8	I am president of a statewide environmental organization,
, D.C.	9	Illinois Friends of the Earth, which is a branch of the
AGTON	10	National Friends of the Earth organization. I wish to
ASHIP	11	comment upon the Safety Goals for Nuclear Power Plants
NG, W	12	for both my family and for Illinois Friends of the Earth.
Inital	13	I live in the Village of Essex, Illinois, which
I SN3.	14	has a population of 500 people. I have four children and
EPORT	15	a husband and our family enjoys living in Essex. The
W. , B	16	small size of the town makes it not only peaceful and
SET, S	17	quiet, but easy to participate in village matters.
I STRI	18	We are four and a half miles south of Common-
1TT 00	19	wealth Edison's Braidwood nuclear station, which is under
ñ	20	construction. We are 14 miles southeast of Dresden
	21	nuclear station, where two units are operating and one
	22	is shut down for an experimental decontamination with
	23	corrosive chemicals. I am involved in a legal suit to
	24	stop the decontamination, because we who live downwind
	25	and those who live down river are expected to be guinea

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pigs for the nuclear industry. We are 22 miles southeast of the LaSalle nuclear plant, where nuclear fuel loading has either just finished for the first time or will shortly. We are concerned about allegations contained in affidavits from workers who built the plant who say there are major structural flaws in it. I requested this last Wednesday, the 28th of April, of Harold Denton of the Department of Nuclear Reactor Regulation, that loading of nuclear fuel be halted until it could be determined what basis in fact the allegations had. I have not heard

12 from Harold Denton, nor have I received notification from 13 the U. S. Postal Service that my letter has been received. 14 I continue to receive calls from workers who also wish to 15 give affidavits. I hope that someone pays attention before 16 it is too late.

17 I spend a good deal of my time with matters 18 dealing with public health and safety in regard to the nuclear facilities surrounding me. Besides involvement 19 in a suit against the Dresden decontamination and working 20 with former workers on affidavits of shoddy construction 21 22 at LaSalle, I am an intervenor in the licensing for 23 operation of the Braidwood nuclear plant, and was an intervenor in the relicensing of the Morris spent fuel 24 operation. I oppose a federal takeover of that facility 25

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or expansion of it.	
It becomes a full-time job working on these	
issues. I am angry because it is something I feel I	
have to do, not something I wish to do.	
I am doing it to protect my children, but	
doing it takes time away from them. I would rather	1.1

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6 7 bake cookies for them to take on expeditions or listen to 8 my daughter read or play tag with my two year old than 9 go to meetings, write newsletters, and read the Federal 10 Register. No one reimburses me for gas or pays the 1. 22 2. 11 cost of photocopying all the endless copies which have 12 to be supplied to the NRC. I just wish someone would pay my phone bill once in a while. You'd be surprised 13 14 at how large a phone bill you can run up trying to track 15 down information so that you can protect your family 16 from unreasonable hazards.

17 I am telling you all of this so that you under-18 stand a bit more about why I am commenting the way I 19 am. I want you to know that I am a person. I am not a 20 nuclear physicist or engineer. I think that it should 21 be people like me who help make decisions about nuclear 22 power. It is not just a decision for scientists. I am 23 glad you are asking how we feel, even though I know 24 many people who think they do not have any right to comment on such a complex and scientific subject. 25

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You state that your second proposed safety 1 goal is "Societal risks to life and health from nuclear 2 power plant accidents should be as low as reasonably 3 achievable and should be comparable to or less than the 4 risk of generating electricity by viable competing 5 technology." 6 I would like a definition of "viable competing 7 technologies." What does "viable" mean? What does 8 "competing" mean? Is it viable if utilities wish to 9 use a technology rather than it simply being available 10 for use? 11 I assume that it is "competing" if the technology 12 costs the same or less than Nuclear technology. Is that 13 before or after nuclear technology receives its research 14 and development subsidies? Before or after nuclear 15 technology receives subsidization of fuel enrichment? 16 Before or after the costs of thousands of years of safe-17 guarding nuclear waste? Before or after subsidies through 18 the Price-Anderson Act, which limits utility responsibility 19 for health effects and property damage due to a nuclear 20 accident. 21 It is not really technology of any sort which 22

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It is not really technology of any sort which competes with nuclear technology. It is conservation, appropriate design of new construction, and retrofitting of energy-consumptive old buildings. This would lower the

2-10rt5 need for electricity to heat homes and public buildings. 1 It would create much needed jobs, and it would lessen the 2 risk of a large scale nuclear accident which might kill 3 and injure thousands of people and render some of the 4 most fertile agricultural land in the world worthless. 5 554-2345 I think that the total risks of nuclear power 6 20024 (202) plants resulting from normal operation should be comparable 7 to or less than the total risk of conserving the amount 8 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. of electricity generated, such conservation taking place 9 through proper design of new construction and retrofitting 10

and insulation of old. 11

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MS. SCHILLER: Mrs. Rorem, your time is up. 12 Would you bring your remarks to a close. I'm sorry 13 MRS. ROREM: That's a good place to stop.

MS. SCHILLER: Thank you very much for your statement. Now stay at the mike if you would, please.

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You did ask a question about viable competing 17 technologies, which perhaps one of the panelists would 18 19 answer. If you choose you may ask another question instead. MRS. ROREM: I think that it's fairly obvious 20 what a viable or competing technology is. I simply I 21 22 think put it in to find out the fact for whom is it viable, for whom is it competing. Are we talking about 23 in a free market? If we are talking about in a free 24 market it certainly makes a difference, but I don't think 25



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MS. SCHILLER: Are there any comments? 1 DR. REMICK: I would make one comment. The viable 2 competing technology, there is an attempt to define that in 3 the document and Mr. Rathbun is looking for that. 4 The other point you raised, you indicated that 5 you wrote to Mr. Denton and you have not received a reply. 6 If you could provide me with the information on the 7 date and subject I would be happy to see what happened to 8 your letter. 9 MRS. ROREM: I sent it certified mail. 10 DR. REMICK: Is this just recently? 11 MRS. ROREM: Last Wednesday. The trouble is 12 when you are dealing with something like fuel loading, 13 which doesn't take all that long to accomplish, something 14 getting delayed in the mail or getting held up 15 some place makes a big difference to those people who 16 think it affects the public health and safety. 17 MR. RATHBUN: The discussion on the viable and 18 competing technology is on Page 17. 19 MS. SCHILLER: Thank you very much. 20 Mrs. Rorem, have you left a copy of your 21 testimony with the court reporter? 22 MRS. ROREM: No, I haven't, but I will. 23 MS. SCHILLER: Thank you. 24 Is Bill Garfield from the Sierra Club in the 25

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	1	audience? I know we are early, Mr. Garfield, but most
	2	of us can't stand this heat too much longer.
	3	Mr. Garfield is speaking for the Sierra Club,
	4	correct?
345	5	MR. GARFIELD: Correct.
554-20	6	Thank you very much.
(202)	7	I would like to summarize Sierra Club's policy
20024	8	on nuclear power before I go into some a little more
N, D.C.	9	specific comments.
NGTON	10	The Three Mile Island incident demonstrated
VASHL	11	to the Sierra Club the unacceptable risk of nuclear
ING, V	12	energy. We had at such point decided to take a stronger
BUILD	13	stand than the organization had previously taken.
LERS	14	We are now opposed to the licensing, construction
TEPOH	15	and operation of nuclear power plants. We are additionally
S.W	16	in favor of phasing out of the existing operating plants,
EET.	17	and we further would like to see power, temperature and
H SI'H	18	heat transfer rates in large plants reduced when necessary
300.11	19	to increase plant safety margins.
	20	On reactor safety specifically we have certain
	21	concerns related to various things. One is mechanical
	22	failure such as what happened with Three Mile Island.
	23	Another is human failure, which also happened with Three
	24	Mile Island.
	25	Another concern is natural disasters such as

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2 Canyon Plant and another issue would be act of war or 3 sabotage such as could have been the case when Israel 4 attacked the nuclear plant under construction in Iraq.

I also have some examples which are in the 5 appendix to my statement of some incidents that have 6 occurred. I think that most of them are well documented 7 and well-known to people that have studied this issue, 8 but just to summarize, some of the incidents include 9 the Browns Ferry fire in 1975, which was near Decatur, 10 Alabama, the numerous construction problems that are 11 occurring at construction sites at the LaSalle plant 12 here in Illinois, the Marble Hills plant in Indiana, 13 the South Texas nuclear plant in Matagorda County in 14 Texas -- that's near where I lived for a few years --15 and the three plants that were recently cancelled by 16 the Tennessee Valley Authority due to the problems that 17 they decided were more than they felt like dealing with. 18

19 There are also such problems as the corroding 20 pipes on various plants built by Westinghouse, such as 21 the ones near Rockford, New York, which I understand 22 had a leakage due to corrosion from nuclear materials 23 in the piping, and that leakage problem, it's reported, 24 could happen on any number of plants that were built to 25 similar specifications.

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Those are some of the examples. I could go on, 1 but the point is made that if we are going to talk about 2 nuclear safety you have to recognize the fact that there 3 have been a lot of incidents contrary to what the nuclear 4 industry seems to want the general public to think. 5 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 I think these incidents are serious and shouldn't 6 be taken as something that can simply be brushed off, 7 given the consequences of the problems with a nuclear 8 plant. 9 I'm not sure if I'll stay within my four minutes 10 if I do this, but I could get into a couple of comments 11 I had written down that specifically addressed some of 12 the goals that were in your Safety Goals for nuclear 13 power plants discussion paper. 14 If my time is up, we will just stop. 15 MS. SCHILLER: You can go on for another minute 16 and then ask a question with your other two minutes. 17 MR. GARFIELD: All right. I will summarize the 18 goal statement so you know which one I am referring to 19 and make a comment. 20 The first one, the risk would be comparable to 21 or less than that of other viable means of generating 22 electricity, meaning that -- that's a goal, I should say. 23 My comment: If a coal plant or a solar collector 24 malfunctions or even blows up, the consequences are for 25

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the most part limited to the site. This is not so with 1 a nuclear accident. Any leak, ruptured pipe, or equipment 2 failure could result in anything from serious health 3 effects, at least in the long run, to the devastation 4 that developes from a core meltdown. 5 554-2345 Next goal summary, guoted from the goal: 6 (202)"... no individual bears a significant additional risk 7 20024 to life and health." 8 D.C. I ask the question: How can this be measured? 9 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, A person could appear healthy for 20 years before showing 10 signs of cancer traceble to a nuclear plant leak, and 11 it would be very difficult to prove that that cancer 12 had been the result of a nuclear plant leak, and I 13 wonder very much how such a goal could be fulfilled. 14 I'll close with that question. 15 My other comments are in writing. 16 MS. SCHILLER: Thank you very much. 17 Would you like to ask another question, because 18 you still have a little time if you would. 19 MR. GARFIELD: Let's start with that question. 20 The question is how can we possibly have a goal that 21 relates to an individual bearing any significant risk 22 to their health and life when it is such an immeasurable 23 thing? 24 MR. BERNERO: Basically what you deal with in 25

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a case like this, you're measuring the risk of a low frequency-high consequence event where you don't have statistics to prove. You won't have direct experience like -- oh, I'm trying to think of an example -- when you buy a product from a production line, they can 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, D.C. 20024 (202) 554-2345 sample enough of the product to prove that all of the product or a sufficient number of the product is good. You will not be able to measure it directly, and what one has to do is predict it and have enough confidence in the predictive methods and their uncertainties to be satisfied. That's the real problem.

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1 MR. GARFIELD: It seems to me, and this gets 2 into my second question which just developed from your 3 response, is that the usual way -- let's talk about cancer. 4 That seems to be a favorite concern. The usual way 5 of detecting long range cancer effects, I understand --1. and I'm not a scientist -- is to inject rates in labs 7 with abnormal amounts of some carcinogen to determine 8 whether 20 years down the line a human being would 9 actually end up getting cancer. It seems like something 10 similar has been done with nuclear, with radiation, 11 with injecting, say, so many rems or rads, whatever it 12 is, of radioactive material into, say, a laboratory rat 13 to determine that the rat would indeed get cancer as 14 a result of this if he was exposed to it over 20 years, 15 and the determination I thought was that it would be extremely small doses could have this effect on a certain percentage of the population.

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MR. BERNERO: Well, if you recall from history 19 that we had the nuclear weapons in Hiroshima and 20 Nagasakyi and then some very high exposures to Pacific 21 islanders during the early hydrogen bomb tests, these are 22 a major source of information about the likelihood of 23 inducing cancer in people, and then for more prolonged 24 exposures to lower levels there are animal experiments, 25 and there are extensive reports and analyses on these

	1	subjects and there is taken a presumption that even
	2	at the very lowest levels there is an accrued probability
	3	of suffering cancer and in risk analyses there is a
	4	count taken of that. It is very difficult at extremely
345	5	low levels to establish because then we get into background
554-2	6	radiation levels and it masks effects and it is very
1 (202)	7	difficult to know what it really is.
2002	8	So there is some account in the predictions,
N, D.C	9	but again it cannot be directly measured.
NGTO	10	MS. SCHILLER: Thank you Mr. Bernero, and thank
VASHI	11	you Mr. Garfield for your statement and your question ⁵ .
ING.	12	Thank you very much. This does conclude the
PUILD	13	presentation by speakers who have indicated in advance their
ERS	14	wish to present testimony to this public hearing, to
NULTIN	15	the NRC today.
M.C	16	We can stay a few minutes if there is anyone
Taa.	17	who would like to ask a question of one of our panelists.
	18	If you do have a question, please raise your
11 00	19	hand and it will be necessary, because all of these
2	20	proceedings are on record, to identify yourself.
	21	Yes, sir.
	22	MR. CAMPBELL: Stanley Campbell for the
	23	Sinnissippi Alliance. I was wondering if the final report
	24	will give an analysis of each specific site and risks.
	25	In other words, would you rate each and every nuclear

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power plant that is on-line or going to be on-line within 1 2 the next few years? 3 MR. BERNERO: This safety goal report or policy 4 statement will not include that sort of thing, but there 5 are two places where plant specific analyses may be 6 available in the near future. 7 One is that within the NRC there is a growing 8 conviction that it is worthwhile to analyze every plant 9 for its reliability and I consciously use the word 10 "reliability" because it is considered most effective 11 to look at systems failure, core melt probability without detailed risk analysis on every site, although one can 12 deduce in general terms what the attendant risk of core 13 melt would be, so that you could expect in the coming few 14 years, three, four, five years, I'm not sure of the length 15 of time, a large number of specific plant reliability 16 17 evaluations. In addition, there is one report that I am 18 familiar with that should be published in a few months 19 that uses accident characteristics of a typical reactor, 20

just accident source terms drawn up from previous analyses, and then assuming that all reactors are the same, it analyzes each site in the United States.

24 So it gives a direct comparison of site to site, 25 not for the reactor that's on there because we don't have

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1 the information on each specific reactor, but for, we 2 call them siting source terms. They are synthetic 3 accident characteristics that we believe are representative 4 of a typical water reactor. 5 (202) 554-2345 MR. CAMPBELL: Would we be able to get that? 6 MR. BERNERO: Oh, yes, that will be a published 7 report. I can even give you the number of it right now. 20024 8 NUREG CR 2239. D.C. 9 WASHINGTON, Earlier in the day there was some discussion 10 of the siting rule making and it's one of the analytical 11 reports prepared as part of that work. BUILDING, 12 MR. CAMPBELL: A follow-up question. Is there 13 going to be an odds? Are you going to give odds to 300 7TH STREET, S.W., REPORTERS 14 which nuclear power plant is going to experience this 15 partial or complete core melt down? 16 MR. BERNERO: Oh, no. You see, the difficulty 17 is if you look at the individual plant reliability 18 assessments, then you get the odds when you look at the 19 site. See, if you look at the site you have to presume 20 that it is an average reactor or what kind of reactor 21 you're going to presume when you look at the specific 22 reactor. Then you get a detailed analysis of the probab-23 ility of having the accident. 24 MR. CAMPBELL: So you can guess right now 25 which nuclear power plant is going to have an accident?

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I mean, could you really?

2	MR. BERNERO: No. When you do a risk analysis
3	you calculate the probability of each kind of .ccident
4	for that plant, and so far we have got maybe 12 risk
5	assessments down in the United States and a couple in
6	Germany and a number in Japan and so forth.
7	So we have some calculated probabilities for
8	reactor accidents at specific plants, but it's not a
9	calculation of where will the next accident happen.
10	MS. SCHILLER: Mrs. Rorem.
11	MRS. ROREM: However, will it be possible, for
12	instance, to extrapolate backwards for ma, since I live
13	in the shadow of so many of these, and be able to make
14	an assessment of what risk I am taking and what my
15	chances are, for instance, of being affected by a major
16	nuclear accident at one of the facilities surrounding
17	me? Will the statistics be such that that will be
18	possible to do?

MR. BERNERO: I would say they would give you a fair approximation because we can look and have looked at existing reactor risk assessments and looked at the average probabilities for severe accidents, and we can at least give you that, the average probability, and obviously we are making a presumption on a plant that hasn't been analyzed that it is somewhere near the

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	1	average. We have no direct way of knowing whether it
	2	is near the average or substantially higher or substant-
	3	ially lower.
13	4	MRS. ROREM: I'm just thinking about whether
345	5	or not the chambers of commerce across the country are
554-2	6	going to be adding risk assessments in their pushes
4 (202	7	to get people to settle in certain parts of the country
2003	8	or of a state.
N, D.C	9	MS. SCHILLER: Thank you for your comments,
NGTO	10	Mrs. Rorem.
NASHI	11	I see more hands and that is all we will take
ING, 1	12	and you really must be brief.
BUILD	13	Oh, I am wrong, I see three, and I will call
TERS	14	on you first because I don't believe you have spoken
RPOR	15	at all today. Please tell us who you are.
S.W. , F	16	MRS. O'LAUGHLIN: I'm Geraldine O'Laughlin.
EET, S	17	I'm from Chicago and also LaSalle County. I had written
H STR	18	a question but didn't get it up. It was, in view of
300 TT	19	the fact that a strong national defense is a major concern
	20	of this administration, what consideration has been
	21	given to our nation's vulnerability with so many power
	22	plants throughout the country. Doesn't that present a
	23	military liability? Is this a consideration in the future
	24	of nuclear power?
	25	MS. SCHILLER: Would someone wish to comment on

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. 1	our	military	liability?	You	needn't	if	you	don't	want

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2 to.
3 MR. RATHBUN: All I can say is as far as
4 these proposed safety goals and policy statement, we

5 really didn't think about acts of war, which is what 6 you're asking.

MRS. O'LAUGHLIN: Thank you.

8 MS. SCHILLER: I think everyone understands
9 your concern, but is not prepared to answer at this
10 point.

I'm only going to take Miss Allen and Mr.
Garfield and then this hearing will be closed, and you
must be brief, Miss Allen.

14 MISS ALLEN: I would like to ask, in view of 15 the fact that one of the reactor safety people at Argonne a couple of years ago said to me that the civilian power 16 17 was only one percent of the problem, and he wasn't 18 talking about atomic war, he was talking about the weapons 19 reactors and accumulated waste, I would like to ask 20 about the Nuclear Regulatory Commission's ability to 21 regulate other sources of production of such things, and I would like to wonder, we have heard today estimates 22 23 which range between one chance in a thousand per reactor 24 per year to one chance in ten million per reactor per 25 year, somewhere in there.

2-13rt8

I wonder what the probability of Three Mile 1 Island happening or the probability of a candle at Browns 2 3 River or Chalk River, I wonder if you have one chance 4 per year that one person will be killed or one chance 5 in a hundred per year that a hundred people will die 20024 (202) 554-2345 6 in one incident or even if you only have one chance in 7 ten million, but indeed that chance might affect ten million people in the Chicago area, I wonder about these 8 REPORTERS BUILDING, WASHINGTON, D.C. 9 things and I solicit your comments upon them. 10 MS. SCHILLER: Thank you. 11 MISS ALLEN: If this be so, how do we shut 12 them down. 13 DR. REMICK: Let me approach the first part and 14 hope Mr. Bernero can answer the last part. I think the 15 one percent you are referring to, I'm assuming that 300 7TH STREET, S.W., 16 somebody has told you that the high level waste problem 17 is primarily from the military, department of Defense 18 type of operation for weapons, but I don't see then how 19 you carried that over into nuclear power plant accidents. 20 I think it is correct that a preponderance of 21 the waste that existed in the country currently is waste 22 from the weapons program in the country and not commercial 23 waste. I think that's what you are referring to in one 24 part of your statement. When you are relating to 25 nuclear power plant accidents, I don't see the relationship

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of your question. 1 MS. SCHILLER: Thank you. 2 MR. BERNERO: I would like to speak to the 3 probability. You have heard today and offer the advice 4 that there is a terminology problem that dogs the field. 5 It is a very substantial one. In the safety goal and 6 policy statement discussion in NUREG-0880, there is spoken 7 of a probability of one chance in ten thousand of core 8 melt, sometimes interpreted as severe core damage and 9 estimates heard range from one chance in a thousand to 10 one chance in a hundred thousand, and in all of the 11 discussions today I know of no one who spoke of any 12 different level, and I will from my own experience say 13 this is a chance of a core damage or core melt accident. 14 Then one of the speakers, George Klomf from 15 Commonwealth Edison was further subdividing into 16 the probability of if you had a core melt accident, what 17 is the probability of subsequent failure in containment 18 and then if you had failure of containment what would be 19 the subsequent probability of a fatal release, and those 20 are separate probabilities. 21

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Safety goal is discussing core melt probability. That's an accident that can fail to cool the core so that severe damage is done to the core. It is not a given. It is not a certainty that that means people are dying off.

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	1	MS. SCHILLER: Thank you.
	2	Mr. Garfield.
	3	MR. GARFIELD: Thank you.
	4	Somebody may have addressed this earlier today,
345	5	but I didn't hear an answer if they did. It seems like
) 554-1	6	an obvious question. The LaSalle plant as you all should
4 (202	7	know has apparently been either up for or approved for
2002	8	an operating license. Has it been approved?
N, D.C	9	MR. BERNERO: It had a low power license.
NGTO	10	This is a license to put the fuel in it and test it.
VASHI	11	You can't generate marketable electricity.
INC'	12	MR. GARFIELD: Fine. What I want to understand
TING SHALLOUTD	13	is in light of all of the information that's come out
	14	recently on that particular plant about all sorts of
	15	construction problems, which I don't have to go into
3.W.	16	I think you have heard enough about how in the world
133	17	did the NRC ever go ahead and approve that? That's what
116 11	18	I would like to know.
11 000	19	MR. BERNERO: Earlier in the day there was
	20	a question raised by one of the speakers about that,
	21	and I think I can say with confidence that the three of
	22	us are not directly involved in that licensing.
	23	MR. GARFIELD: I didn't think you were.
	24	MR. BERNERO: And we don't know enough to give
	25	you a specific answer for that case. However, this is not

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198 uncommon, that challenges to the construction quality are 1 raised. They are investigated with vigor and our office 2 here in Glen Ellyn, I'm sure, has heard of these. And if 3 someone is concerned that they haven't, a simple phone 4 call can clarify that. 5 554-2345 But our regional office is the one. It is the 6 (202)office responsible, and I am confident that they are 7 20024 investigating or have investigated the allegations. 8 D.C. 9 MS. SCHILLER: Thank you very much. Let's hope 300 7TH STREET, S.W., REPORTERS BUILDING, WASHINGTON, that this has been a productive day. I want to thank 10 all of you for coming to the hearing particularly to those 11 of you who testified. I think we all want to thank the 12 League of Women Voters of Illinois Education Fund for 13 setting up this meeting and thank our panelists, Dr. 14 Remick, Mr. Rathbun and Mr. Bernero. 15 (Whereupon at 5:30 p.m. the meeting 16 was adjourned.) 17 18 19 20 21 22 23 24 25

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

Nuclear Regulatory Commission

in the matter of: Public Meeting on Proposed Safety Goals for Nuclear Power Plants Date of Proceeding:May 5, 1982 (4:00 P.M. session)

Docket Number:

Place of Proceeding: May 5, 1982

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Lois LaCorte

Official Reporter (Typed)

Lois La Corte (emm)

Official Reporter (Signature)