

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON BASIC SAFETY PRINCIPLES FOR
NUCLEAR POWER PLANTS

Location: Washington, DC

Date: Wednesday, April 6, 1988

Pages: 1 - 41

Ann Riley & Associates

Court Reporters

1625 I Street, N.W., Suite 921

Washington, D.C. 20006

(202) 293-3950

BB0415024B BB0406
PDR 10CFR
PT9.7 PDR

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

3 ***

4 BRIEFING ON BASIC SAFETY PRINCIPLES FOR NUCLEAR POWER PLANTS

5 ***

6 PUBLIC MEETING

7 ***

8 Nuclear Regulatory Commission

9 Room 1130

10 1717 H Street, Northwest

11 Washington, D.C.

12
13 Wednesday, April 6, 1988

14
15 The Commission met in open session, pursuant to
16 notice, at 2:00 p.m., the Honorable LANDO W. ZECH, Chairman of
17 the Commission, presiding.

18
19 COMMISSIONERS PRESENT:

20 LANDO W. ZECH, Chairman of the Commission

21 THOMAS M. ROBERTS, Member of the Commission

22 KENNETH CARR, Member of the Commission
23
24
25

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

S. CHILK
V. STELLO
H. DENTON
W. PARLER
H. KOUTS

P R O C E E D I N G S

[2:00 p.m.]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CHAIRMAN ZECH: Good afternoon, ladies and gentlemen. Commissioner Bernthal and Commissioner Rogers will not be with us this afternoon. Commissioner Roberts will be joining us shortly.

This afternoon the Commission will be briefed on the International Nuclear Safety Advisory Group -- the INSAG report, entitled "Basic Safety Principles for Nuclear Power Plants." This report was recently released by the International Atomic Energy Agency at their symposium on severe accidents in March of 1988.

Dr. Herb Kouts was chairman of the INSAG working group who prepared this report, and is here today to summarize the recommendations of the document.

I would like to welcome you today here, Dr. Kouts. We appreciate your long and substantial service to our country and we are delighted that you are with us here today. It is my understanding that the Executive Director for Operations, Mr. Victor Stello, and Mr. Harold Denton, the Director of our Office of Governmental and Public Affairs, will also provide their insights into this significant report.

The report promotes a safety philosophy for everyone involved in all the various aspects of commercial nuclear power plant development and operation. The Commission has recently

1 received copies of the IAEA report, which we have here, and we
2 will of course take some time to review the report itself, but
3 we are pleased to have this briefing today.

4 I understand copies of the slides to be used during
5 the presentation are available in the back of the room.

6 I emphasize that this is an information briefing and
7 no formal Commission action is anticipated at the meeting
8 today.

9 Do any of my fellow Commissioners have any opening
10 comments?

11 [No response.]

12 CHAIRMAN ZECH: If not, Mr. Denton, would you please
13 proceed?

14 MR. DENTON: Yes, Mr. Chairman.

15 The International Nuclear Safety Advisory Group, so-
16 called INSAG, was formed in 1985 by the Director General, so
17 they are an advisory body to the Director General of the IAEA.
18 It had a dozen or 13 members, all of whom were well known
19 experts in reactor safety. It includes Dr. Kouts, of course,
20 and people you know -- Dr. Birkhofer, Mr. Tanguy, Mr.
21 Siderenko.

22 This group wrote the official IAEA report on the
23 Chernobyl accident, and I believe it was that accident that
24 really was the impetus for producing this basic principles
25 report that we have today, and the report does talk about

1 principles for existing and future reactor types, but there is
2 special attention given in it to those principles that emerged
3 from post-accident analyses.

4 Herb will be the first speaker. Herb, of course, is
5 well known to you. As of April 1st, he stepped down from his
6 job as the head chairman of the Department of Nuclear Energy at
7 Brookhaven to become a scientist again, apparently after
8 serving in that capacity for over a decade -- and, of course,
9 you remember he used to be Director of the Division of Research
10 right here in the NRC.

11 After Herb's presentation, Vic will describe and
12 discuss the uses that the NRC might make of this report.

13 CHAIRMAN ZECH: All right. Thank you very much.

14 Dr. Kouts, welcome again. Please proceed.

15 MR. KOUTS: Thank you very much, Mr. Chairman,
16 Commissioners.

17 The document I am going to talk about is "Basic
18 Safety Principles for Nuclear Power Plants." It follows the
19 intent that the International Atomic Energy Agency and its
20 Director General had when they formed INSAG in 1985, which was
21 to develop, where possible, commonly shared safety principles,
22 commonly shared meaning commonly shared across the surface of
23 the earth.

24 This was a concept, in fact, which dates to Mr.
25 Manning Munsing, who foresaw the need for an organization and

1 an activity of this sort a few years before, and through the
2 National Association of Engineering Societies arranged for the
3 International Atomic Energy Agency to try the INSAG concept and
4 its activity on a trial basis.

5 It was after the Chernobyl accident in 1986 that
6 there was a meeting in Vienna sponsored by the International
7 Atomic Energy Agency, at which one of the principal
8 recommendations was that INSAG should now get on with the job
9 of preparing these commonly shared safety principles, and that
10 has been the origin of this book.

11 CHAIRMAN ZECH: All right.

12 [Slide.]

13 MR. MOUTS: In agreeing to do this, INSAG was
14 motivated by the realization that -- as my first slide
15 indicates -- that although there are some 400 nuclear plants
16 which have come to fruition in the world, two of these have had
17 severe accidents which have destroyed them, and this led in
18 turn to some 31 deaths of individuals who were involved in the
19 Chernobyl accident.

20 Now in other activities, in other industrial
21 industries which have as extensive a background as nuclear
22 power has, this might be considered a not bad level of safety,
23 but INSAG recognized that the nuclear field is faced with
24 stronger requirements than have been imposed on other
25 industrial endeavors, and even a safety record which is good

1 for most industrial operations would not be adequate for the
2 nuclear field.

3 So the safety principles are directed toward an
4 improvement of that record, and I will tell, as I go on, just
5 how that improvement is to be achieved.

6 Also guiding the deliberations that led to the
7 document was a realization that especially since the Chernobyl
8 accident there has been a maturing and a converging of certain
9 concepts around the world, so that this seemed a propitious
10 time for trying to achieve the kind of document which had been
11 sought from a group of this sort.

12 Commonly shared safety principles now seem to become
13 a possibility.

14 [Slide.]

15 MR. KOUTS: Furthermore, again, as on my next slide,
16 the international consequences of accidents in nuclear power
17 plants were also recognized following the Chernobyl accident
18 and it became clear that we now have a need for safety
19 principles which can be accepted on an international basis, so
20 that activities in one country can be acceptable, or at least
21 there is a touchstone to determine whether the activities are
22 acceptable in other countries as well.

23 So these are the motivations which led to preparation
24 of this document at this time.

25 The document begins with some introductory

1 discussion, such as a preface and an introductory part, in
2 which certain areas which are necessary for the interpretation
3 and application of the principles are taken up.

4 First of all, the document is directed toward nuclear
5 plants of current types. Now by current types, I mean not only
6 light water reactors, which of course we are predominantly
7 interested in in this country, but other nuclear power plant
8 types which may be used in different countries around the
9 world. That includes fast breeder reactors as they are used in
10 France and in the Soviet Union, gas cooled reactors as they are
11 used in a number of countries, heavy water reactors -- all
12 reactors of current types had their safety characteristics
13 examined from a standpoint of formulation of this document and
14 it is meant to apply universally to all of these.

15 Now, there are some restrictions in the document.
16 First of all, it is a document which is pertinent to
17 electricity generating plants. We have concentrated on this.
18 However, it was pointed out by our Soviet colleague that a
19 number of plants in the Soviet Union are now directed toward
20 space heating of apartment buildings, industrial complexes and
21 that the safety principles that we were devising had more
22 general applicability -- or most of them did, at any rate, and
23 so it is pointed out that this broader applicability is still
24 possible.

25 However, there are some nuclear plants that are under

1 consideration, particularly in this country, which some of
2 their proponents have termed "inherently safe" types. We did
3 not up take up the question of inherently safe reactors. We
4 took the view that these are safety principles that are meant
5 to be applied universally, and if there are certain principles
6 which be virtue of plant design are not necessarily to be
7 covered by these principles, this is a situation which one
8 would have to argue again, rather than argue from the other
9 end.

10 That is the coverage from a standpoint of which
11 plants are treated.

12 The question of new plants versus old plants also
13 comes up, and the question of backfit. As you will see, we
14 have different objectives for old plants and for new plants and
15 make the comment that for backfitting with respect to old
16 plants, one has to take into account a number of
17 considerations. There must be a balance, a balance being
18 achieved through a cost benefit study to determine to what
19 extent the backfit is required.

20 Recognizing that nothing is absolutely safe and the
21 search for absolute safety is a fruitless one, secondly it is
22 necessary to optimize the use of resources. One would not want
23 to devote large amounts of resources to areas of improvement
24 that have only marginal benefit.

25 Thirdly, that some improvements have downsides as

1 well, and it is necessary to consider what might be wrong with
2 an "improvement" as well as what might be achieved with it.

3 So these are the considerations that have to be taken
4 into consideration in the backfit situation.

5 [Slide.]

6 MR. KOUTS: In the next slide, I have a note to the
7 effect that we have to recognize that, although nuclear plants
8 use high technology, and this is considered by many people to
9 be a source of fear, at least by the general public, because
10 high technology is so poorly understood, in fact, it is
11 necessary and it is proper to take advantage of high technology
12 to achieve safety in nuclear power, and, as a matter of fact,
13 with high technology, one can achieve higher levels of safety
14 than one can achieve in ordinary industrial endeavors.

15 This is a source of strength and not of weakness, and
16 it is, in fact, the underpinning of safety in nuclear power,
17 because it's the basis for use of defense in-depth and safety
18 rests on defense in-depth in this field.

19 [Slide.]

20 MR. KOUTS: Emphasized in the document is a concept
21 of safety culture which is a concept which was stated in our
22 report on the Chernobyl accident. Safety culture is the
23 pervasive presence of safety thinking which must accompany
24 activities by all individuals who are active in the process of
25 production of nuclear power. It's a safety thinking among all

1 those concerned in these activities and we bring in the concept
2 of safety culture and its application in many places throughout
3 the document. I would like to return to this shortly.

4 [Slide.]

5 MR. KOUTS: A couple of more aspects of the document.
6 The document is not a regulatory document. It is not directed
7 toward regulatory use. That is, it's not formulated in a style
8 which could be readily adopted by regulatory organizations. It
9 is, in fact, a document which is directed more to the nuclear
10 industry, and is associated with what we consider to be the
11 quest for excellence which nuclear industry should be expected
12 to be undertaking.

13 For this reason, the document is written in the
14 present tense. Everything is said as if the practices and the
15 principles which are discussed in the document are, in fact, in
16 current use. Now, as a matter of fact, almost everything in
17 the document is in current use in one place or another. After
18 all, we were seeking commonly safety principles and if we
19 introduced ideas which were radical, or brand new, they would
20 not be commonly shared principles.

21 So, you will find that much of what I have to say,
22 reflects practices that you are familiar with. You will find
23 that the document, however, written in this way, is a
24 structured document which tells why and what and how to achieve
25 what is recommended.

1 The report was originally, in our first thoughts, to
2 be a kind of deductive report. We wanted to establish
3 objectives to be achieved and then, to whatever extent we
4 could, derive from the objectives the things which should be
5 done to achieve the objectives. We found that this is not
6 really possible. It's not possible to derive all of nuclear
7 plant safety as an exercise in logic from the objectives
8 themselves, but this led us to a tiered approach in which we
9 have objectives, some fundamental principles and some specific
10 principles; each layer of which overlays those below and in
11 which each successive tier becomes more specific. We ended
12 these tiers, however, before we got to specific types of
13 nuclear plants because we wanted the generality.

14 [Slide.]

15 MR. KOUTS: We have three objectives. Twelve
16 fundamental principles and fifty specific principles in the
17 document and the specific principles are more specific
18 applications of the general principles, but you will find that
19 specific principles commonly are related to more than one
20 fundamental principle; and they all are related to several of
21 the objectives. I'd like to just go through the objectives.

22 [Slide.]

23 MR. KOUTS: As I said, there are three objectives.
24 They are not independent objectives. They are interrelated.
25 There is a general objective and there are two objectives

1 which, in a sense, are means of achieving the general
2 objective. The general objective is to protect individuals,
3 society and the environment by establishing and maintaining in
4 nuclear power plants, an effective defense against radiological
5 hazard. This is a concept which is not unfamiliar to you
6 gentlemen and, as a matter of fact, is not inconsistent with
7 objectives which you have discussed as safety goals in your
8 deliberations. In fact, we see this as representative of an
9 international consensus on safety goals, or on safety
10 objectives, as these have been discussed in many countries.

11 [Slide.]

12 MR. KOUTS: The second safety objective is a
13 radiation protection objective. I have given it a shorthand
14 statement on my slide. It really reads, "to ensure in normal
15 operation, that radiation exposure within the plant and due to
16 any release of radioactive material from the plant, is kept as
17 low as reasonably achievable," which is the ALARA concept, "and
18 to ensure mitigation of radiation exposure due to accidents."
19 Each of these objectives and each of the principles which
20 follow as concise a statement of the principle and the
21 objective as we could possibly give it. The idea being, that
22 we wanted to achieve a statement which somehow could be born in
23 mind. But, we could not enfold in the statement itself all of
24 the things we wanted say in this connection.

25 So, there is a discussion section which follows, and

1 the discussion section enlarges on the short statement, gives
2 the extent of it, gives the exceptions to it, and clarifies the
3 meaning. That's done in the objectives I'm reading out and,
4 for instance, in this particular objective, there's a
5 discussion of non-stochiastic and stochiastic effects of
6 radiation and the fact that the statement itself is directed
7 toward both of these kinds of radiation. The second safety
8 objective is a very long one, and a very important one. It's
9 on page 8 of your document and I've given it just a shorthand
10 statement on my slide which is that accidents are to be
11 prevented and especially to be prevented are accidents with
12 high consequences.

13 [Slide.]

14 MR. KOUTS: In fact, there are three aspects to this
15 technical safety objective; the prevention of accidents, the
16 prevention of accidents with high consequences and the
17 prevention of high consequences from accidents; and these are
18 not really the same thing. They are different things and they
19 are implemented in different ways in the course of the
20 document's unfolding.

21 There is a target which is established in the
22 discussion of the technical safety objective. This target is a
23 probability of severe core damage for nuclear power plants
24 which does not exceed 10^{-4} per year for
25 existing plants, 10^{-5} for plants in the future,

1 for plants of future construction and off-site consequences
2 which require extensive off-site measures, or any off-site
3 measures at all, an order of magnitude less probable than these
4 numbers. This is a safety objective which, again, you would
5 not find unfamiliar to you.

6 [Slide.]

7 MR. KOUTS: There are twelve fundamental principles;
8 three of these are related to management, three of them to
9 defense in-depth, and six of them, for want of a better term,
10 are called technical principles, and I'd like to run through
11 them with some reasonable speed, if I may, and then go into
12 some of the specific principles.

13 The fundamental principles on management; the first
14 of these is that an established safety culture governs the
15 actions and interactions of all individuals and organizations
16 engaged in nuclear power activities. In this principle, we
17 state the components of a safety culture. There are many
18 components and many implications of the concept.

19 Included are: the requirement for dedication and
20 accountability on the part of all individuals involved in these
21 activities, a dedication which starts with senior management of
22 the organizations involved, including the senior management of
23 the operating organization, who establish clear policies and
24 clear lines of responsibility and communication among their
25 staff, with strict adherence to requirements, with reviews and

1 training of their staff, leading to an openness with respect to
2 safety questions on the part of the staff and a questioning
3 attitude concerning safety matters. This is the principle
4 which outlines the requirements to be achieved in the quest for
5 excellence.

6 [Slide.]

7 MR. KOUTS: The second fundamental principle is one
8 which is closely related to this Commission. That is, that the
9 ultimate responsibility -- I'm sorry, I'm not at that one --
10 this says that the ultimate responsibility for the safety of
11 the nuclear power plant rests with the operating organization.
12 This is in no way diluted by the separate activities and
13 responsibilities of designers, suppliers, constructors and
14 regulators. In this, we are not discussing financial
15 responsibility, but moral and procedural responsibility.

16 This responsibility is such that when a nuclear plant
17 operator accepts his plant from whoever has constructed it for
18 him, he accepts all responsibility for what has gone before and
19 what is to go after. This is a cradle-to-grave responsibility.

20 At the same time, there are other responsibilities of
21 other organizations involved; suppliers, constructors,
22 designers and also a responsibility of the technical community
23 to ensure that the proper backup in safety is always available
24 to be used by the industry.

25 [Slide.]

1 MR. KOUTS: The next fundamental principle is the one
2 I started to refer to. The Government establishes the legal
3 framework for nuclear industry and independent regulatory
4 organization. This is, again, shorthand and I really want to
5 read the full statement as it is in the document. "The
6 principle establishes the legal framework for a nuclear
7 industry and an independent regulatory organization which is
8 responsible for licensing and regulatory control of nuclear
9 power plants and for enforcing the relevant regulations. The
10 separation between the responsibilities of the regulating
11 organization and those of other parties is clear; such that the
12 regulators retain their independence as a safety authority and
13 are protected from undue pressure."

14 This last statement is one which we were requested
15 specifically to have put in by some of the smaller countries in
16 which the maintenance of this clear responsibility by the
17 regulatory organization is sometimes jeopardized.

18 COMMISSIONER ROBERTS: Would you elaborate on that?
19 What undue pressures?

20 MR. KOUTS: Well, this was a subject for long
21 discussion inside our group as we wrote this, and the pressures
22 themselves were never clearly stated by the individuals who
23 said that they felt them in their countries.

24 These are pressures in countries where the
25 independence of the regulatory organization is not so clear at

1 the outset, and I could name countries which I feel have this
2 problem, but I don't think this is an appropriate time to do
3 so.

4 Generally, however, these are usually small countries
5 in which governmental organization is not as extensive and well
6 developed as it is in this country.

7 As you know, the Nuclear Regulatory Commission has
8 this unique character of not being an administrative
9 organization responsible to the administrative side of the
10 government, and it has a legislative responsibility and an
11 administrative responsibility as well. This is not so in many
12 countries, and the common thing in most countries is that the
13 regulatory organization is directly under the administration of
14 the country, so that the possibility for pressures to be
15 applied exists there as it does not exist in the United States.

16 I hope that makes it a little clearer.

17 COMMISSIONER ROBERTS: Well, that's fine. Thank you.

18 [Slide.]

19 MR. KOUTS: The principles of defense-in-depth are
20 three in number.

21 The first of these is a statement to be achieved
22 through defense-in-depth and that is my shorthand statement on
23 the next slide. Defense-in-depth is provided through a set of
24 physical barriers which are meant to ensure that radioactive
25 material in the plant is confined in regions where it is

1 supposed to be. These barriers are not to be jeopardized, and
2 for this reasons various mechanisms and procedures are built
3 into the plant design and into plant operations -- to ensure
4 that the barriers remain intact and that radioactive material
5 continues to be confined.

6 There is an appendix in the report which discussed
7 defense-in-depth very extensively, and I recommend it to the
8 readers. It is a very good appendix. It was largely put
9 together by our Soviet compatriots.

10 [Slide.]

11 MR. KOUTS: The next principle of defense-in-depth
12 says that particular attention is provided to the primary means
13 of achieving safety, which is the prevention of accidents,
14 particularly those which could cause severe core damage.

15 This principle in its discussion makes it clear that
16 this is to be achieved through a number of measures which are
17 necessary -- quality in construction and design, inspection in
18 the process of construction and design, monitoring in
19 construction, design and in operation at a later time, and
20 appropriate training of all individuals who will have
21 responsibilities in the operation of the plant.

22 [Slide.]

23 MR. KOUTS: The next fundamental principle is on
24 accident mitigation and management. It says that in plant and
25 off site mitigation measures are available or prepared for

1 which would ensure substantial reduction of the effects of any
2 accidental release of radioactive material.

3 There are, in fact, several components to this
4 fundamental principle, and they are discussed in connection
5 with it.

6 The first of these is accident management, and
7 accident management is given a strong position in this report.
8 I will take up accident management on its own in a little
9 while.

10 A second part is engineered safety features which are
11 accident management features built into the design which
12 provide an inherent mitigative component to the design of the
13 plant.

14 And the last is off-site counter measures which may
15 be prepared for in the event -- to be exercised in the event
16 that all other measures to prevent the accident have not been
17 successful.

18 There are then a number of fundamental principles
19 dealing with more technical matters and I'll go through these
20 quickly.

21 [Slide.]

22 MR. KOUTS: There is the fundamental principle on
23 design involving assured practices. Nuclear power plant
24 technology is based on engineering practices which have proven
25 by testing and experience and are reflected in approved codes

1 and standards and other appropriately documented statements.
2 This is the requirement for standards and for use of such
3 standards, not only in the design of a plant but in the supply
4 of components, in the manufacture and in the operation at a
5 later time. In all of these, and in maintenance and repair, in
6 all of these activities use of approved, appropriate standards
7 is called for.

8 [Slide.]

9 MR. KOUTS: There is a fundamental principle on
10 quality assurance, which is closely related. Quality assurance
11 is applied throughout nuclear power plant activities as part of
12 a comprehensive system to ensure with high confidence that all
13 items delivered and services and tasks performed meet specific
14 requirements. This has essentially the same coverage as the
15 previous principle and is related to achievement of quality and
16 to the documentation of this achievement.

17 [Slide.]

18 MR. KOUTS: A fundamental principle of training:
19 Personnel engaged in activities bearing on nuclear power plant
20 safety are trained and qualified. Design and operations
21 promote safety through preventing wrong actions and
22 compensating for their effects. This is the human factors
23 principle, and included in the discussion are the means by
24 which human factors can be built on in order to achieve safety
25 and to avoid problems.

1 [Slide.]

2 MR. KOUTS: There is a principle on safety analyses
3 which states -- I have a paraphrase in my slide -- detailed
4 safety assessments are made before design and operation of a
5 plant begin. These are well documented, independently reviewed
6 and updated as necessary. This principle is stated in such a
7 way that it does not specify the number of reviews to be called
8 for.

9 Now in the course of a safety review, one could have
10 one-step licensing, one could have two-step licensing,
11 depending on the national requirements and the specific needs.
12 The principle describes the contents of a safety analysis
13 report and introduces the need for probabilistic analysis to
14 accompany deterministic analysis in the safety review.

15 A fundamental principle on radiation protection which
16 implements the objective on radiation protection -- I need not
17 read it.

18 [Slide.]

19 MR. KOUTS: A fundamental principle on operating
20 experience feedback and the need for safety research, which we
21 consider extremely important. Organizations concerned ensure
22 that operating experience and the results of research relevant
23 to safety are exchanged, reviewed and analyzed and that lessons
24 are learned and acted on, and this is a responsibility and a
25 principle which applies to many organizations at the same time

1 -- to plant staff, to the regulatory organization and to
2 industry.

3 [Slide.]

4 MR. KOUTS: This is the last of the fundamental
5 principles. As I have said, there are 50 specific principles.
6 The principles of a specific character are put in a form which
7 advances from the earliest concepts of the plant -- when siting
8 is being considered -- to the time when the plant is in
9 operation and even may go through to decommissioning.

10 Those principles are included in the first five
11 categories on this slide: siting, design, manufacturing and
12 construction, commissioning and operation. There are also two
13 other categories of specific principles, dealing with the
14 possibility that accidents might occur to plants and that there
15 will be a need to do something as a result.

16 So, there are three principles on accident management
17 and three principles on accident preparedness.

18 [Slide.]

19 MR. KOUTS: As I said earlier, these are concepts,
20 principles and objectives which one finds broadly used
21 throughout industry, throughout the world. Some of the
22 concepts we have pushed a little farther than one finds in many
23 places, and I have listed the principal ones of these on my
24 next slide.

25 That is, first of all, the use of probabilistic risk

1 analysis in safety analysis at the outset. I should say first
2 that these may not be absolutely new to the Nuclear Regulatory
3 Commission. Some of these are in fact being implemented by the
4 Commission, but they are not -- all of them -- broadly accepted
5 in this form throughout the world. PRA to be used in safety
6 analysis.

7 The second is reliability targets for safety systems.
8 In some quarters it has been proposed that reliability targets
9 be established on the basis of various events having assigned
10 probabilities associated with them for each plant. This would
11 be a sub-division of probability of accident occurrence which
12 we are not in accord with. We do not believe that this makes
13 very much sense. It does not allow for the constructors,
14 designers and operators of nuclear plants to make the trade-
15 offs on safety which are necessary to achieve optimum safety,
16 but this particular concept is stated in the form that if any
17 safety analysis which includes a risk assessment, credit is
18 taken for a certain reliability of a certain safety component
19 of the plant. There should be some basis for judging that that
20 reliability is achieved, and this is precisely what is said
21 here.

22 There is a discussion in the specific principles of
23 training and qualification of maintenance personnel. This goes
24 beyond what is done in many places, but we recognize that many
25 of the problems that are had with respect to nuclear plants are

1 the result of failures in maintenance and maintenance
2 organizations.

3 CHAIRMAN ZECH: Could you talk to us just a little
4 bit more on the reliability targets, just very briefly. In
5 other words, could you elaborate on how the reliability target
6 could be demonstrated, perhaps for a new safety system that
7 might be contemplated. What was the discussion that resulted
8 in your reference to reliability targets in safety systems?

9 MR. KOUTS: The discussion did not establish how
10 reliability targets should be verified. That is a matter which
11 will have to be taken up in connection with each application.

12 I could direct a few of my thoughts toward this.

13 CHAIRMAN ZECH: Yes, please do -- just briefly.
14 Thank you.

15 MR. KOUTS: Some application of this principle is
16 already made within the Nuclear Regulatory Commission. There
17 are reliability targets for containments which require testing
18 of containments as the -- I'm not sure which appendix to Part
19 50. Appendix J of Part 50 applies here. There are reliability
20 targets for the emergency diesel systems. There are well-
21 established methods by which reliability of these components is
22 established and maintained in the process of operation, well,
23 before operation and after operation of the plant.

24 CHAIRMAN ZECH: I was thinking of specifically for
25 advanced reactor designs and perhaps for designs in advanced

1 reactors you don't really have the established data for what
2 kind of reliability targets and how would you proceed towards
3 something you don't have all the data for.

4 Did you have any discussion on that?

5 MR. KOUTS: Well, we did in an earlier principle,
6 where we talked about proven engineering principles, in which
7 we talk about how tests are to be made on a component or system
8 basis or either in miniature -- not in miniature -- scale
9 tests, or on systems as they are to be constructed and used or
10 how reliability could be based on firmly established analytical
11 models and how these models are to be verified and on what
12 basis reliability can be vested in them.

13 CHAIRMAN ZECH: All right. Thank you.

14 MR. KOUTS: There is a discussion of this in that
15 section.

16 CHAIRMAN ZECH: All right. Thank you.

17 To get back to the training and qualification of
18 maintenance personnel, this is the concept which extends
19 somewhat beyond its application in many places. We also have a
20 similar extension with respect to the instruction of operating
21 staff in the results of probabilistic risk assessments
22 pertinent to the plant.

23 This does not mean that operating staff are to be
24 instructed in the PRA or to be even able to understand the PRA,
25 but they should understand the significance of the PRA from the

1 standpoint of what are the possible things they should be
2 prepared to work against in the operation of the plant.

3 [Slide.]

4 MR. KOUTS: Finally, we include a section on accident
5 management and discuss accident management procedures and
6 training.

7 I would like to briefly illustrate the design process
8 as part of the document devoted to specific principles. The
9 design process has three specific principles attached to it,
10 one on proven management, one on proven technology and the
11 general basis for design. The general basis for design is an
12 extremely important principle and a very long one.

13 I have two slides with respect to each one of these.
14 Design management, statement of design management, assignment
15 and subdivision of responsibility for safety are kept well
16 defined throughout the design phase and during any subsequent
17 modification.

18 To illustrate how the discussion goes, design
19 management is to be under a single manager, the design manager,
20 who is responsible entirely for the design of the plant, and
21 who is responsible for establishing an organization with clear
22 interfaces and clear assignment of responsibility.

23 He does include in his staff a safety coordinating
24 group which is responsible of ensuring that all of the
25 activities associated with building and the safety of the plant

1 are adequately met and who is also responsible for coordinating
2 the safety aspects of these among the various groups. This
3 safety coordinating group is also responsible for ensuring that
4 the operating group is coordinated to the assigned group.
5 This is a practice which architect engineers commonly use.
6 Quality assurance is used in the design configuration control,
7 is importantly implied.

8 COMMISSIONER CARR: Now that single manager design
9 concept goes from a reactor all the way through balance of
10 plant?

11 MR. KOUTS: Yes. There is one man who's responsible
12 for putting it all together.

13 CHAIRMAN ZECH: Let me ask a question, too, on this
14 design management subject. For example, I didn't see that the
15 report addresses the question of containment performance.
16 Maybe you didn't get into that level of specifics, but it seems
17 to me that I would be interested to know if there was any
18 discussion of current containment performance or any objectives
19 for future plants for containment performance? Was that
20 discussed under this design concept that we are looking at
21 here?

22 MR. KOUTS: No. Containment was not specifically
23 discussed, but the concept of confinement was discussed,
24 confinement as a means of restricting the dispersal of
25 radioactive material in case it becomes liberated from fuel.

1 The activity of confinement is discussed at
2 substantial length. What think you are asking about is found
3 only in this objective -- technical safety objective -- in
4 which we state that the probability that off-site measures
5 would be needed as a result of an accident should be at least
6 an order of magnitude less than the probably of severe core
7 damage itself.

8 So this in itself contains implicitly a kind of
9 containment/performance criteria, without specifically saying
10 so.

11 CHAIRMAN ZECH: But you didn't get into the specifics
12 of containment performance?

13 MR. KOUTS: No, we did not.

14 CHAIRMAN ZECH: All right.

15 MR. KOUTS: We recognized the fact that the objective
16 of confining radioactive material after an accident can be met
17 by a number of methods and it gets very complicated to try to
18 analyze them method by method.

19 CHAIRMAN ZECH: But you didn't get into any of those
20 specific methods?

21 MR. KOUTS: No, we did not.

22 CHAIRMAN ZECH: All right. Thank you. You may
23 proceed.

24 [Slide.]

25 MR. KOUTS: The second specific principle is a

1 restatement of design purposes of the use of proven technology
2 as stated in the fundamental principles, and I will just pass
3 over those two slides and get into the general basis -- it
4 should be "general basis" instead of "general basic" for
5 design.

6 [Slide.]

7 MR. KOUTS: As I said, this is a very important
8 principle, and I would just like to read it. "A nuclear power
9 plant is designed to cope with a set of events including normal
10 conditions, anticipated operational occurrences, extreme
11 external events and accident conditions. For this purpose,
12 conservative rules and criteria incorporating safety margins
13 are used to establish design requirements. Comprehensive
14 analyses are carried out to evaluate the safety performance or
15 capability of the various components and systems of the plant."

16 [Slide.]

17 MR. KOUTS: In the discussion section, it is made
18 clear that this means that no plant damage should result from
19 normal operation. No plant damage should result from
20 reasonably expected events. The role of engineered safety
21 features is then introduced and design basis accidents are
22 defined. There is a somewhat new concept here, because it is
23 pointed out that the including of engineered safety features to
24 prevent plant damage should lead in the long term to the
25 elimination of any risk outliers in the safety analysis.

1 There should be no single means by which the plant is
2 threatened in a way outside compared to any other way.

3 COMMISSIONER CARR: By plant damage you mean core
4 damage?

5 MR. KOUTS: Yes, we mean core damage.

6 [Slide.]

7 MR. KOUTS: My last slide relates to accident
8 management, and I state it simply to emphasize the fact that
9 accident management is dealt with at such length in the report.
10 This is not a report. This is not a set of big safety
11 principles addressed to accidents. It is a set of safety
12 principles addressed to maintaining the safety of the --
13 protecting the safety of the public, primarily through
14 protecting the plant itself, but recognizing the fact that
15 accident management measures are necessary.

16 I'll simply say, however, that the report recognizes
17 two levels of safety -- of accident management.

18 The first of these is accident management to prevent
19 any accident initiator from developing a sequence which could
20 threaten the existence of the plant and its safety.

21 The second is accident management after the fact,
22 after an accident damaging the core.

23 CHAIRMAN ZECH: In your discussions of this accident
24 management topic, did you -- did the group try to come up with
25 any definition of the large off-site release?

1 MR. KOUTS: No, we did not define a large, off-site
2 release -- a large off-site release is one which requires
3 extensive measures off-site. That is the closest we came to
4 it.

5 CHAIRMAN ZECH: All right.

6 MR. KOUTS: We did not include action levels or any
7 concepts of that sort in this report.

8 CHAIRMAN ZECH: You didn't get into the specifics in
9 that regard?

10 MR. KOUTS: No, we did not. That scenario we leave
11 to organizations like the International Radiation Protection
12 Committee.

13 That is the report, Mr. Chairman.

14 CHAIRMAN ZECH: All right, thank you very much, Dr.
15 Kouts. Appreciate it very much.

16 Mr. Stello, did you have some comments to make? I
17 know you attended, with Mr. Denton, I believe, the meeting in
18 Sorrento recently, where I believe this was a subject of a
19 discussion over there.

20 Perhaps you could give us your views on discussions
21 at that time very briefly, and then perhaps comment on Dr.
22 Kouts' presentation.

23 MR. STELLO: Let me start by observing that as I read
24 and understood this report, a number of times in fact, it
25 became clear to me that this is the kind of document that has

1 considerable value to the entire nuclear industry.

2 The point I made at that time, which I firmly
3 believe, if some of the utilities that have had difficulty in
4 the United States had read, understood and faithfully
5 implemented the basic philosophy and policy of this document,
6 they would not have had problems.

7 I think there is a message in here for all the
8 industry, not just the owners and operators of the utility, but
9 the architect engineers, consultants, regulators, DOE, and
10 anyone else associated with the nuclear industry would benefit
11 would from reading and studying this document.

12 That led me to what I think is the first point I wish
13 to make, the question of what further distribution ought this
14 document have in the United States, what ought be NRC's view,
15 and I would recommend with the Commission's concurrence that we
16 would undertake widespread, and have gotten permission to copy
17 the document, widespread distribution in the United States to
18 bring this document into the hands of organizations that would
19 indeed benefit from it.

20 I don't believe that it's even close to suggesting or
21 recommending to the Commission any mechanism by which the
22 Commission would formally incorporate or adopt such a document
23 as part of our regulatory process. That would be some
24 considerable time in the future, if at all. If, indeed, there
25 is any need to suggest that this ought to, in any way, shape or

1 form, be folded in as a requirement.

2 In fact, I don't think the document is written in
3 such a way that it is, indeed, intended to be requirements as
4 Dr. Kouts has already said.

5 There is going to be a task, and I don't know what
6 the next steps will be with IAEA, of responding to the request
7 from IAEA to all the member countries of which the United
8 States is a member, of what our comments might be and
9 suggestions back to IAEA, and I think the Commission may want
10 to consider whether it wishes to offer itself as a vehicle to
11 coordinate the kind of response that go back to IAEA. That's a
12 question that I think will be coming to us shortly.

13 I think there's no question that within the technical
14 staff, within the general staff of the NRC, that we will -- in
15 fact, I've started to make copies to distribute within the
16 staff so the staff would have the benefit of reading it. I
17 think it is a good document. I think it would not be, in my
18 view, productive to try to fine-tune this document with a lot
19 of detailed requirements. I think the document will serve a
20 very useful purpose. We need to take some next steps and come
21 back to the Commission at some point in the future; perhaps as
22 long as six months from now, depending on what IAEA's views are
23 on the document. I suspect it will be a long term affair.

24 It's up to the Commission, I think, to react, at
25 least, informally. I would suggest that what I do is to draft

1 a letter and get widespread distribution of the document, of
2 the information to the industry as the first step and let the
3 others follow as they will.

4 Harold, did you want to say anything?

5 MR. DENTON: No.

6 CHAIRMAN ZECH: Don't have anything else, Mr. Denton,
7 to add to that?

8 MR. DENTON: No.

9 CHAIRMAN ZECH: You were at the meeting too, where
10 they discussed the report. Do you subscribe to what Mr. Stello
11 has said and he'd given his views on the value of the document.

12 MR. DENTON: I think the document is a milestone.
13 That it's got -- a particular virtue is it's scrutable and
14 readable. So much of the technical literature has been written
15 in jargon, in the past, and in textbooks which deal with
16 reactor physics issues and thermal hydraulics. These are
17 stated in principles that everyone in the industry can
18 understand and apply and I think the Committee's done a great
19 job in pulling them together and they are -- they're all that
20 new or novel, but the fact that they're in one place and in one
21 setting you can read them, is a real accomplishment, and I
22 think the group was well -- the report was well received in the
23 meeting where they were presented.

24 CHAIRMAN ZECH: All right, thank you very much.

25 Questions from my fellow Commissioners? Commissioner Roberts?

1 COMMISSIONER ROBERTS: No.

2 CHAIRMAN ZECH: Commissioner Carr?

3 COMMISSIONER CARR: Yes, I've got one question for
4 Dr. Kouts. Why did you not consider Wind Scale a severe
5 accident?

6 MR. KOUTS: Well, Wind Scale was certainly a severe
7 accident, but it was not to a nuclear power plant; it was to a
8 production plant. Even though -- it was a dual purpose plant,
9 of course. It's certainly not a plant of modern type, because
10 it was an air-cooled reactor. That is essentially it.

11 COMMISSIONER CARR: Okay, I would say that the
12 document's a very nice policy statement for overall policy. I
13 certainly, as part of the Commission, wouldn't have any
14 hesitation in endorsing it as a policy statement, if that's
15 what the IAEA expects or something. If they want comments,
16 that -- it's more or less a motherhood type statement and so
17 you could -- it's good words and I think, as you said, Vic,
18 people should have read it a lot of years ago and heeded it and
19 so I offer that comment anyway.

20 CHAIRMAN ZECH: Thank you very much.

21 MR. DENTON: If I could respond to that. I think the
22 IAEA will be asking for comments and I would think our aim
23 would be to review it thoroughly, with the aim toward improving
24 it and fostering its use. We'll get that opportunity.

25 CHAIRMAN ZECH: All right, fine, thank you. Dr.

1 Kouts, I just had one question. Did the discussion of human
2 factors and personnel errors come into the group's critique and
3 analysis of all of the principles that we've talked about here
4 today?

5 MR. KOUTS: Very much so. One of the fundamental
6 principles is a human factors principle. We discussed this to
7 a considerable extent and came to the conclusion that human
8 factors have to enter into accident prevention and accident
9 mitigation in two ways. One of these is through design of the
10 plant in the first place; design in such a way as to reduce the
11 possibility that incorrect things will be done and correct things
12 will be done when they're necessary, and the second is through
13 extensive training and qualification of personnel. These are
14 points which are strongly emphasized in the document.

15 CHAIRMAN ZECH: Did the group think that there was
16 adequate attention being given to human factors, as regards
17 commercial nuclear power plants today?

18 MR. KOUTS: I don't know that that question was ever
19 raised in exactly that form.

20 CHAIRMAN ZECH: But it was emphasized.

21 MR. KOUTS: Strongly emphasized, and, in fact, there
22 is a realization in the INSAG organization that the greatest
23 benefits to be gained in reactor safety in the future are
24 probably in the field of human factors. And, as a matter of
25 fact, through accident management measures, measures to

1 terminate a sequence of events that might be developing and
2 through mitigation measures, again procedures, procedure
3 development for this purpose; substantial benefit could be
4 gained in lowering risk levels in nuclear plants. This is
5 probably the direction which offers the greatest advantage in
6 the future in reduction of risk in nuclear plants.

7 CHAIRMAN ZECH: Was any significant discussion of
8 maintenance -- did that take place during the discussion
9 period? Maintenance of the power plants themselves?

10 MR. KOUTS: Absolutely.

11 CHAIRMAN ZECH: Could you tell us just a little bit
12 about that? I know there's a difference of philosophy in some
13 of the various countries on it. Perhaps you could enlighten us
14 a little bit on the discussion that took place.

15 MR. KOUTS: We did not review the difference in the
16 way maintenance is treated in different countries, but we
17 certainly reviewed the implications of the reportable events as
18 they come into the Nuclear Regulatory Commission and the fact
19 that they are approximately equally divided among maintenance-
20 caused problems and problems of other kinds. The fact that not
21 enough is being done with respect to maintenance personnel to
22 instruct them, to qualify them, and to make them aware of the
23 importance of their actions.

24 CHAIRMAN ZECH: Was there any discussion of testing
25 and surveillance, especially at power levels?

1 MR. KOUTS: We did not discuss that, except for the
2 point made that no activities are to be done without written
3 procedures. Certainly that was discussed in connection with
4 the Chernobyl accident.

5 CHAIRMAN ZECH: All right. Well, let me thank you
6 very much for your participation and a very fine report. I too
7 feel that -- you know, I recognize that it is difficult on an
8 international scale to attempt to put together a document that
9 can be acceptable to a broad group of nations. I think we
10 should recognize that, as you point out, it is basic safety
11 principles and you haven't gotten into the specifics, as you
12 have emphasized here today several times.

13 On the other hand, I agree with Mr. Denton and also
14 Mr. Stello that a document of this kind, that has considerable
15 value, especially written in language that can be understood --
16 and is not as technical as many of the documents that we deal
17 with on a day to day basis. So I think it does have
18 considerable value. I would certainly agree that it should be
19 given widespread dissemination.

20 I think the Commission should review it carefully and
21 decide whether some further action and endorsement on our part
22 would be appropriate. I think that most of the principles that
23 we talked about here today and that I've had a chance to review
24 in the document are principles that -- as I say, most of them
25 are certainly generally ones that we have already adopted in

1 our country, and it isn't a lot of new, startling information.
2 it is a compilation in my view of generally sound principles
3 that can contribute towards safety.

4 So I would suggest that the staff review it carefully
5 too, and come to the Commission perhaps with a recommendation
6 for any further action that you think should be warranted on
7 the part of the Commission in commenting on or in support of
8 the document. It certainly seems one that should be generally
9 accepted. I think we would have to study it a little bit more
10 carefully to see if there is any parts of it that we might have
11 problems with, but I do think, Dr. Kouts, that you and your
12 colleagues have made a valuable contribution to providing in
13 one document some principles that certainly look like they can
14 in general be acceptable.

15 They do, of course, as far as I can see -- I'll maybe
16 ask you one last question. As far as our development of the
17 safety goal, which took place over a very lengthy period of
18 time as you are well aware, it does appear to me that the
19 principles you have articulated here are quite consistent with
20 our development and our philosophy in developing the safety
21 goal.

22 Would you care to comment on that?

23 MR. KOUTS: I think they are completely consistent
24 with the objectives that you have been discussing, yes.

25 CHAIRMAN ZECH: All right. Thank you very much.

1 Are there any other questions from my fellow
2 Commissioners?

3 [No response.]

4 CHAIRMAN ZECH: If not, we thank you very much for a
5 very fine presentation and for your contribution again to our
6 country.

7 We stand adjourned.

8 [Whereupon, at 3:03 p.m., the briefing was
9 concluded.]

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

SPECIFIC PRINCIPLES

SITING (4)

DESIGN (22)

DESIGN PROCESS (3)

GENERAL FEATURES (7)

SPECIFIC FEATURES (12)

MANUFACTURING AND CONSTRUCTION (2)

COMMISSIONING (4)

OPERATION (12)

ACCIDENT MANAGEMENT (3)

EMERGENCY PREPAREDNESS (3)

PRA TO BE USED IN SAFETY ANALYSIS

RELIABILITY TARGETS FOR SAFETY SYSTEMS

TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL

OPERATING STAFF INSTRUCTED IN PRA RESULTS

ACCIDENT MANAGEMENT PROCEDURES AND TRAINING

DESIGN PROCESS

DESIGN MANAGEMENT

PROVEN TECHNOLOGY

GENERAL BASIS FOR DESIGN

DESIGN MANAGEMENT (2)

UNDER A SINGLE MANAGER

CLEAR INTERFACES AND CLEAR RESPONSIBILITIES

A SAFETY COORDINATING GROUP

QUALITY ASSURANCE IN THE DESIGN

CONFIGURATION CONTROL

DESIGN MANAGEMENT (1)

THE ASSIGNMENT AND SUBDIVISION OF RESPONSIBILITY FOR SAFETY ARE KEPT WELL DEFINED THROUGHOUT THE DESIGN PHASE OF A NUCLEAR POWER PLANT PROJECT, AND DURING ANY SUBSEQUENT MODIFICATION.

PROVEN TECHNOLOGY (1)

TECHNOLOGIES INCORPORATED INTO DESIGN HAVE BEEN PROVEN BY EXPERIENCE AND TESTING. SIGNIFICANT NEW DESIGN FEATURES OR NEW REACTOR TYPES ARE INTRODUCED ONLY AFTER THOROUGH RESEARCH AND PROTOTYPE TESTING AT THE COMPONENT, SYSTEM OR PLANT LEVEL, AS APPROPRIATE.

PROVEN TECHNOLOGY (2)

USE APPROPRIATE STANDARDS

VALIDATE ANALYTICAL METHODS

USE REALISTIC OR CONSERVATIVE METHODS

GENERAL BASIC FOR DESIGN (1)

A NUCLEAR POWER PLANT IS DESIGNED TO COPE WITH A SET OF EVENTS INCLUDING NORMAL CONDITIONS, ANTICIPATED OPERATIONAL OCCURRENCES, EXTREME EXTERNAL EVENTS AND ACCIDENT CONDITIONS. FOR THIS PURPOSE, CONSERVATIVE RULES AND CRITERIA INCORPORATING SAFETY MARGINS ARE USED TO ESTABLISH DESIGN REQUIREMENTS. COMPREHENSIVE ANALYSES ARE CARRIED OUT TO EVALUATE THE SAFETY PERFORMANCE OR CAPABILITY OF THE VARIOUS COMPONENTS AND SYSTEMS IN THE PLANT.

GENERAL BASIC FOR DESIGN (1)

NO PLANT DAMAGE FROM NORMAL OPERATION

NO PLANT DAMAGE FROM REASONABLY EXPECTED EVENTS

FOR IMPORTANT ACCIDENT SEQUENCES:

ESF'S TO PREVENT PLANT DAMAGE

ESF'S TO MITIGATE CONSEQUENCES

DEFINES DESIGN BASIS ACCIDENTS

NO RISK OUTLIERS

ATTENTION TO MAINTENANCE AND TESTING

ACCIDENT MANAGEMENT

STRATEGY FOR ACCIDENT MANAGEMENT

TRAINING AND PROCEDURES FOR ACCIDENT MANAGEMENT

ENGINEERED FEATURES FOR ACCIDENT MANAGEMENT

400 NUCLEAR POWER PLANTS

2 SEVERE ACCIDENTS

MATURITY OF SAFETY CONCEPTS

INTERNATIONAL CONSEQUENCES OF ACCIDENTS

NUCLEAR POWER PLANTS OF CURRENT TYPES

BALANCE IS NEEDED IN SAFETY

NOTHING IS ABSOLUTELY SAFE

OPTIMIZE USE OF RESOURCES

CONSIDER GOOD AND BAD EFFECTS OF CHANGES

NUCLEAR POWER PLANTS USE HIGH TECHNOLOGY

THIS IS WHY THEY CAN BE SO SAFE

SAFETY CULTURE

STRUCTURE OF THE REPORT

OBJECTIVES

FUNDAMENTAL PRINCIPLES

SPECIFIC PRINCIPLES

GENERAL OBJECTIVE

**TO PROTECT INDIVIDUALS, SOCIETY AND THE ENVIRONMENT
BY ESTABLISHING AND MAINTAINING IN NUCLEAR POWER
PLANTS AN EFFECTIVE DEFENCE AGAINST RADIOLOGICAL
HAZARD.**

RADIATION PROTECTION OBJECTIVE

ALARA IN NORMAL OPERATION

MITIGATION OF RADIATION EXPOSURES FROM ACCIDENTS

TECHNICAL SAFETY OBJECTIVE

PREVENT ACCIDENTS

ESPECIALLY THOSE WITH HIGH CONSEQUENCES

FUNDAMENTAL PRINCIPLE

**AN ESTABLISHED SAFETY CULTURE GOVERNS THE
ACTIONS AND INTERACTIONS OF ALL INDIVIDUALS AND
ORGANIZATIONS ENGAGED IN NUCLEAR POWER
ACTIVITIES.**

FUNDAMENTAL PRINCIPLE

**THE GOVERNMENT ESTABLISHES THE LEGAL FRAMEWORK
FOR A NUCLEAR INDUSTRY AND AN INDEPENDENT
REGULATORY ORGANIZATION.**

FUNDAMENTAL PRINCIPLE

THE ULTIMATE RESPONSIBILITY FOR THE SAFETY OF A NUCLEAR POWER PLANT RESTS WITH THE OPERATING ORGANIZATION. THIS IS IN NO WAY DILUTED BY THE SEPARATE ACTIVITIES AND RESPONSIBILITIES OF DESIGNERS, SUPPLIERS, CONSTRUCTORS, AND REGULATORS.

FUNDAMENTAL PRINCIPLE

SAFETY IS ACCOMPLISHED THROUGH USE OF DEFENCE IN DEPTH.

FUNDAMENTAL PRINCIPLE

**SPECIAL ATTENTION IS DEVOTED TO THE PREVENTION OF ACCIDENTS,
PARTICULARLY ANY WHICH COULD CAUSE SEVERE CORE DAMAGE.**

FUNDAMENTAL PRINCIPLE

**IN-PLANT AND OFF-SITE MITIGATION MEASURES ARE
AVAILABLE OR PREPARED WHICH WOULD ENSURE
SUBSTANTIAL REDUCTION OF THE EFFECTS OF ANY
ACCIDENTAL RELEASE OF RADIOACTIVE MATERIAL.**

FUNDAMENTAL PRINCIPLE

NUCLEAR POWER PLANT TECHNOLOGY IS BASED ON ENGINEERING PRACTICES WHICH ARE PROVEN BY TESTING AND EXPERIENCE, AND WHICH ARE REFLECTED IN APPROVED CODES AND STANDARDS AND OTHER APPROPRIATELY DOCUMENTED STATEMENTS.

FUNDAMENTAL PRINCIPLE

**QUALITY ASSURANCE IS APPLIED THROUGHOUT NUCLEAR POWER
PLANT ACTIVITIES AS PART OF A COMPREHENSIVE SYSTEM TO
ENSURE WITH HIGH CONFIDENCE THAT ALL ITEMS DELIVERED
AND SERVICES AND TASKS PERFORMED MEET SPECIFIED
REQUIREMENTS.**

FUNDAMENTAL PRINCIPLE

**PERSONNEL ENGAGED IN ACTIVITIES BEARING ON NUCLEAR
POWER PLANT SAFETY ARE TRAINED AND QUALIFIED. DESIGN
AND OPERATIONS PROMOTE SAFETY THROUGH PREVENTING
WRONG ACTIONS AND COMPENSATING FOR THEIR EFFECTS.**

FUNDAMENTAL PRINCIPLE

DETAILED SAFETY ASSESSMENTS ARE MADE BEFORE DESIGN AND OPERATION OF A PLANT BEGIN. THESE ARE WELL DOCUMENTED AND INDEPENDENTLY REVIEWED, AND UPDATED AS NECESSARY.

FUNDAMENTAL PRINCIPLE

A SYSTEM OF RADIATION PROTECTION PRACTICES, CONSISTENT WITH RECOMMENDATIONS OF THE ICRP AND THE IAEA, IS FOLLOWED IN THE DESIGN, COMMISSIONING AND OPERATIONAL PHASES.

FUNDAMENTAL PRINCIPLE

**ORGANIZATIONS CONCERNED ENSURE THAT OPERATING
EXPERIENCE AND THE RESULTS OF RESEARCH RELEVANT TO
SAFETY ARE EXCHANGED, REVIEWED, AND ANALYZED, AND THAT
LESSONS ARE LEARNED AND ACTED ON.**

TRANSMITTAL TO:

X Document Control Desk, 016 Phillips

ADVANCED COPY TO:

 The Public Document Room

DATE:

4/11/88

FROM:

SECY Correspondence & Records Branch

Attached are copies of a Commission meeting transcript and related meeting document(s). They are being forwarded for entry on the Daily Accession List and placement in the Public Document Room. No other distribution is requested or required.

Meeting Title:

Briefing on Basic Safety Principles
for Nuclear Power Plants

Meeting Date:

4/6/88 Open X Closed

Item Description*:

Copies
Advanced
to PDRDCS
Copy

1. TRANSCRIPT

1

1

w/ mimeographs

2.

3.

4.

5.

6.

* PDR is advanced one copy of each document, two of each SECY paper. C&R Branch files the original transcript, with attachments, without SECY papers.