UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

FOIA EXEMPTION (b)5
part 1

February 17, 1981

MEMORANDUM FOR: D. A. Ward, Chairman, ACRS Subcommittee on Plant Features Important to Safety

FROM: Richard Major, Staff Engineer Richard Major

SUBJECT: PROPOSED SUMMARY OF THE FEBRUARY 3, 1981 SUBCOMMITTEE ON PLANT FEATURES IMPORTANT TO SAFETY

I have prepared the attached meeting summary for your review. Copies are being distributed to the other ACRS members for their information and comment. Corrections and additions will be included in the minutes of the meeting.

Attachment:
As stated

cc: ACRS Members
ACRS Technical Staff
J. Stolz, NRR
J. Conran, NRR
W. Haass, NRR
E. Rossi, NRR
D. Ross, DSI
G. Zech, NRR

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PROPOSED SUMMARY
OF THE
ACRS SUBCOMMITTEE MEETING ON PLANT FEATURES IMPORTANT TO SAFETY
FEBRUARY 3, 1981
1717 H ST., NW, WASHINGTON, DC

PURPOSE:

The purpose of the meeting was for the Subcommittee to discuss with the NRC Staff the definitions of the terms, "safety grade," "safety related," and "important to safety" as developed for testimony related to the Three Mile Island, Unit 1 restart, as well as review the generic implications of the use of these definitions in the licensing process. The NRC Staff has asked for an ACRS opinion regarding these definitions and related implications regarding design of nuclear power plant systems.

ATTENDEES:

ACRS

D. Ward, Chairman
M. Bender, Member
E. Epler, Consultant
R. Major, ACRS Staff

NRC STAFF

J. Stolz, NRR
J. Conran, NRR
W. Haass, NRR
J. Spraul, NRR
T. Dunning, NRR
H. Levin, DE
E. Rossi, NRR
H. Ornstein, AEOD
M. Medieros, SD
E. Davidson, RES

DOE

P. Davis

EPRI

R. Leyse

WESTINGHOUSE

J. Gallagher

ALDERSON REPORTERS

P. Minson
S. Clinkson

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1. Mr. Ward noted in his opening remarks that as a result of contentions in the TMI-1 restart hearings, the Staff has found it necessary, as well as helpful, in organizing its own thinking to develop concise definitions for the terms: "important to safety," "safety grade," and "safety related."

The term "important to safety" is found in 10 CFR 50, Appendix A of the General Design Criteria. The term applies to those structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

The term "safety grade" is not explicitly used in the regulations, but its usage as applied by the Staff is derived from 10 CFR 100, Appendix A. It includes structures, systems, and components (designed to remain functional for the Safe Shutdown Earthquake) necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guidelines in 10 CFR 100.

The term "safety related" is defined in the regulations (10 CFR 50, Appendix B) in the context of quality assurance program requirements. The term is also used in Regulatory Guides and the Standard Review

Plan in contexts other than quality assurance. The term ~~was similar~~ applies to those structures, systems and components that prevent or mitigate the consequences of postulated accidents and could cause undue risk to the ~~defined as approximately the same as "important to safety" but currently the definition of this term has not been decided.~~ health and safety of the public. This term is generally equivalent to safety grade. and safety related are

Mr. Ward noted that, in general, safety grade ~~is a~~ subsets of important to safety.

Mr. Ward saw as a parallel, if not the same issue, the question of a graded quality assurance system. The Staff has expressed some unhappiness with industry's all or nothing approach to quality assurance. Quality assurance philosophers, in general, would like to see quality assurance applied commensurate with risk. This suggests defining subsets of "important to safety," as one way of starting a graded quality assurance approach. This then serves as a tie-in between the definitions of terms and quality assurance categories.

Mr. Ward noted that the Subcommittee should consider whether to concur with a set of well thought out semantics as proposed by the Staff or whether to work with the Staff to develop definitions of a more comprehensive nature which could have some impact on how systems are designed and evaluated in the future. He noted there was a spectrum of positions the Subcommittee could adopt in between.

2. Mr. Conran noted that converstationally, the Staff tends to use the terms, safety grade, safety related, and important to safety interchangeably a great deal. The terms do however have considerably different meanings in the regulations and regulatory guidance. The Staff's objective at the meeting was to discuss the two terms that the Staff has defined in the course of the IMI-1 restart hearing that is, safety grade and important to safety, and ask for Committee comments, if any, or concurrence if the Committee sees nothing wrong with the way the terms are defined. Mr. Conran noted the Staff has not arrived at a single definition of the term safety related other than in the context of safety assessment.

3. Mr. Bender noted that most of equipment at a nuclear power plant has some relationship to safety. It is the type of relationship that must be addressed. Mr. Bender suggested that there is a need to establish how to descriminate between safety relationships that require certain kinds of engineering provisions, special design treatment, or possibly operational treatment that is different from what would occur under conventional practice.

4. Mr. Conran noted that the Rogovin study had said: "The NRC lacks definitions for safety-related as applied to equipment, systems, structures, and so forth necessary to ensure that Appendix B Quality Assurance standards are implemented consistently. The consequence has been an ad hoc uncontrolled application of safety-related requirements to equipment outside

the reactor protection system and engineered safety features systems." This problem was addressed in the NRC Action Plan in Section I.F. The approach is to expand the "Q" list to cover all equipment important to safety not just components, structures, or systems used to prevent or mitigate accidents. A second aspect of the plan is to rank equipment in order of its importance to safety. There are preliminary steps underway toward developing a graded quality assurance program.

5. Mr. Conran noted that the term, "important to safety" encompasses the broad class of plant features, covered (not necessarily explicitly) in the General Design Critera, that contribute in important ways to the safe operation and the protection of the public in all phases and aspects of facility operation (i.e., normal operation and transient control, as well as accident prevention and mitigation).

6. Mr. Haass explained that the Quality Assurance Branch uses the term, "safety related" to define those items on the Q-list. Those items on the Q-list include items considered safety-grade (seismic Category 1) plus other systems considered ~~important to safety and requiring special requirements~~ significant to the prevention or mitigation of accidents such as radioactive waste systems and fire protection systems. Licensees are also free to include additional items on the list, even if the Staff doesn't consider the additional systems safety related. In general, the Q-list for each plant is composed on a case-by-case basis.

7. Mr. Bender suggested that in setting quality assurance requirements, consideration should be given to a piece of equipment's purpose and the conditions under which it must operate.

8. The Staff suggested in discussing the term, "important to safety" that there is a relationship to the consequences to the plant given a particular component fails. The more severe the consequences of a component's failure the more the assurance needed to lower the probability of the component failing.

9. Since the accident at TMI-2, the Staff noted that the list of safety grade equipment has not been expanded. However, there have been ~~upgrades~~ additions to the Q-list of systems and ~~to the reliability of~~ significant to the protection/mitigation of components ~~important to safety~~ such as the power supply to the pressurizer heaters and PORV position indication.

10. Mr. Bender suggested a set of definitions as follows:

- Importance to safety is a measure of the consequences of failure.
- Safety grade is a measure of quality needed to serve a safety function.
- Safety related refers to the conditions under which the safety function is to be performed.

11. Mr. Haass explained that the Quality Assurance Branch for the purposes of 10 CFR 50, Appendix B applicability separates plant structures, systems, and components into two separate groups -- safety related and important to safety. The safety related grouping contains those structures, systems, and components needed to prevent or mitigate the consequences of postulated accidents as defined by 10 CFR 50, Appendix B and Regulatory Guide 1.29. QA controls satisfy Appendix B and it is required that they be applied in a manner consistent with an item's importance to safety as stated in Criterion 2 of Appendix B. Items important to safety are those remaining structures, systems, and components in the plant that have some effect on safety (needed to provide reasonable assurance that the facility can be operated without undue risk). Quality assurance controls for these items satisfy General Design Criterion 1 of Appendix A (the Staff has not developed detailed requirements for such a QA program).

12. Mr. Haass noted that the Staff is proposing for the future to clarify the applicability of 10 CFR 50, Appendix B to all items important to safety. The basis for this action is derived from Appendix A to 10 CFR 50. Currently, the Staff does not have such a list. The TMI Action Plan describes a request for applicants to develop such a list. The Staff has issued a position to TMI-1, Zion 1&2, and Indian Point 2&3 to develop an expanded Q-list to include all structures, systems, and components important to safety. At this date, these licensees have not responded to the request.

14. Mr. Gallagher, who chairs an ad hoc group that was established through a joint agreement with the NRC Office of of Standards Development and the IEEE, made a brief presentation. The scope of this group (IEEE P827) is to prepare a document that sets criterion for determining the level of importance to safety of the instrumentation, control, and electrical portions of nuclear power generating station systems not covered by IEEE Std. 603. Methods are provided for determining the design basis for each of these systems and for determining the degree of applicability of the requirements of other standards to each of these systems. This determination is based on the level of importance to safety of each system.

The purpose of the document to be prepared by the group is to present a uniform classification approach for determining the applicability of design criteria and design requirements for structures, components, and systems of nuclear power generating station systems, based on the level of their importance to safety.

The basic thought was to develop a graded approach. In this light, requirements already in place could be judged for applicability, and in some cases restrictions could be relaxed if safety functions were not as important with respect to the consequences of failure.

14. Mr. Medeiros from the NRC Office of Standards Development made a brief statement. He said it was his opinion that there is a lack of technical excellence in the area of plant control. He was also disturbed at the level of review for instrumentation and control equipment. He noted control room design needs attention.

FUTURE MEETINGS:

A Subcommittee Chairman's Report is currently scheduled for the March 1981 ACRS meeting, March 12-14, 1981.

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FOIA EXEMPTION (b)5
Part 2

February 17, 1981

MEMORANDUM FOR: D. A. Ward, Chairman, ACRS Subcommittee on Plant Features Important to Safety

FROM: Richard Major, Staff Engineer Richard Major

SUBJECT: PROPOSED SUMMARY OF THE FEBRUARY 3, 1981 SUBCOMMITTEE ON PLANT FEATURES IMPORTANT TO SAFETY

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PURPOSE:

The purpose of the meeting was for the Subcommittee to discuss with the NRC Staff the definitions of the terms, "safety grade," "safety related," and "important to safety" as developed for testimony related to the Three Mile Island, Unit 1 restart, as well as review the generic implications of the use of these definitions in the licensing process. The NRC Staff has asked for an ACRS opinion regarding these definitions and related implications regarding design of nuclear power plant systems.

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1. Mr. Ward noted in his opening remarks that as a result of contentions in the TMI-1 restart hearings, the Staff has found it necessary, as well as helpful, in organizing its own thinking to develop concise definitions for the terms: "important to safety," "safety grade," and "safety related."

The term "important to safety" is found in 10 CFR 50, Appendix A of the General Design Criteria. The term applies to those structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

The term "safety grade" is not explicitly used in the regulations, but its usage as applied by the Staff is derived from 10 CFR 100, Appendix A. It includes structures, systems, and components (designed to remain functional for the Safe Shutdown Earthquake) necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guidelines in 10 CFR 100.

The term "safety related" is defined in the regulations (10 CFR 50, Appendix B) in the context of quality assurance program requirements. The term is used in Regulatory Guides and the Standard Review

Plan in contexts other than quality assurance. The term ~~was almost~~ defined as ~~approximately~~ the same as "important to safety"; but currently the definition of this term has not been decided.

Mr. Ward noted that, in general, safety grade is a subset of important to safety.

Mr. Ward saw as a parallel, if not the same issue, the question of a graded quality assurance system. The Staff has expressed some unhappiness with industry's all or nothing approach to quality assurance. Quality assurance philosophers, in general, would like to see quality assurance applied commensurate with risk. This suggests defining subsets of "important to safety," as one way of starting a graded quality assurance approach. This then serves as a tie-in between the definitions of terms and quality assurance categories.

Mr. Ward noted that the Subcommittee should consider (1) whether to concur with a set of well thought out semantics as proposed by the Staff or (2) whether to work with the Staff to develop definitions of a more comprehensive nature which could have some impact on how systems are designed and evaluated in the future. He noted there was a spectrum of positions the Subcommittee could adopt in between.

2. Mr. Conran noted that converstationally, the Staff tends to use the terms, safety grade, safety related, and important to safety interchangeably a great deal. The terms do however have considerably different meanings in the regulations and regulatory guidance. The Staff's objective at the meeting was to discuss the two terms that the Staff has defined in the course of the TMI-1 restart hearing that is, safety grade and important to safety, and ask for Committee comments, if any, or concurrence if the Committee sees nothing wrong with the way the terms are defined. Mr. Conran noted the Staff has not arrived at a single definition of the term safety related.

3. Mr. Bender noted that most of equipment at a nuclear power plant has some relationship to safety. It is the type of relationship that must be addressed. Mr. Bender suggested that there is a need to establish how to discriminate between safety relationships that require certain kinds of engineering provisions, special design treatment, or possibly operational treatment that is different from what would occur under conventional practice.

4. Mr. Conran noted that the Rogovin study had said: "The NRC lacks definitions for safety-related as applied to equipment, systems, structures, and so forth necessary to ensure that Appendix B Quality Assurance standards are implemented consistently. The consequence has been an ad hoc uncontrolled application of safety-related requirements to equipment outside

Rick: See comments on previous page; staff now has agreed on a single definition

the reactor protection system and engineered safety features systems." This problem was addressed in the NRC Action Plan in Section I.F. The approach is to expand the "Q" list to cover all equipment important to safety, not just components, or systems used to mitigate accidents. A second aspect of the plan is to rank equipment in order of its importance to safety. There are preliminary steps underway toward developing a graded quality assurance program.

5. Mr. Conran noted that the term, "important to safety" encompasses the broad class of plant features, covered (not necessarily explicitly) in the General Design Critera, that contribute in important ways to the safe operation and the protection of the public in all phases and aspects of facility operation (i.e., normal operation and transient control, as well as accident mitigation).

6. Mr. Haass explained that the Quality Assurance Branch uses the term, "safety related" to define those items on the Q-list. Those items on the Q-list include items ~~considered safety-grade~~ (seismic Category 1) plus other systems considered important to safety ~~and requiring special requirements~~ such as radioactive waste systems and fire protection systems. Licensees are also free to include additional items on the list, even if the Staff doesn't consider the additional systems ~~safety~~ related. In general, the Q-list for each plant is composed on a case-by-case basis.

7. Mr. Bender suggested that in setting quality assurance requirements, consideration should be given to a piece of equipment's purpose and the conditions under which it must operate. *Agreed!*

8. The Staff suggested in discussing the term, "important to safety" that there is a relationship to the consequences to the plant given a particular component fails. The more severe the consequences of a component's failure the more the assurance needed to lower the probability of the component failing.

9. Since the accident at TMI-2, the Staff noted that the list of safety grade equipment has not been expanded. However, there have been upgrades to the reliability of components important to safety such as the power supply to the pressurizer heaters and PORV position indication; *and the components involved in such upgradings have been added to the "Q" list.*

10. Mr. Bender suggested a set of definitions as follows:

- Importance to safety is a measure of the consequences of failure.
- Safety grade is a measure of quality needed to serve a safety function.
- Safety related refers to the conditions under which the safety function is to be performed.

We agree This is a good sensible approach and common-sense usage of terms. This set of definitions (or something similar) should be developed in connection with development of "grading" methods for safety level and Q.A.

No! Sounds like groups are exclusive of each other; and Haass admitted he did not intend that. Fitch: We later worked out acceptable words by telecon. gmr

11. Mr. Haass explained that the Quality Assurance Branch for the purposes of 10 CFR 50, Appendix B applicability separate plant structures, systems, and components into two separate groups -- safety related and important to safety. The safety related grouping contains those structures, systems, and components needed to prevent or mitigate the consequences of postulated accidents as defined by 10 CFR 50, Appendix B and Regulatory Guide 1.29. QA controls satisfy Appendix B and it is required that they be applied in a manner consistent with an item's importance to safety as stated in Criterion 2 of Appendix B. Items important to safety are those remaining structures, systems, and components in the plant that have some effect on safety (needed to provide reasonable assurance that the facility can be operated without undue risk. Quality assurance controls satisfy General Design Criterion 1 of Appendix A (the Staff has not developed detailed requirements for such a QA program).

this is OK

OK

12. Mr. Haass noted that the Staff is proposing for the future to clarify the applicability of 10 CFR 50, Appendix B to all items important to safety. The basis for this action is derived from Appendix A to 10 CFR 50. Currently, the Staff does not have such a list. The TMI Action Plan describes such a list. The Staff has issued a position to TMI-1, Zion 1&2, and Indian Point 2&3 to develop an expanded Q-list to include all structures, systems, and components important to safety.

But we do have a ready source for such a list. It would be comprised of structures, systems and components identified explicitly in (a) the GDC (b) The SRPs and (c) Reg. Guides.

14. Mr. Gallagher, who chairs an ad hoc group that was established through a joint agreement with the NRC Office of of Standards Development and the IEEE, made a brief presentation. The scope of this group (IEEE P827) is to prepare a document that sets criterion for determining the level of importance to safety of the instrumentation, control, and electrical portions of nuclear power generating station systems not covered by IEEE Std. 603. Methods are provided for determining the design basis for each of these systems and for determining the degree of applicability of the requirements of other standards to each of these systems. This determination is based on the level of importance to safety of each system.

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The basic thought was to develop a graded approach. In this light, requirements already in place could be judged for applicability, in some cases restrictions could be relaxed if safety functions were not as important with respect to the consequences of failure.

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FOIA EXEMPTION (b)5
Part 2-3

February 17, 1981

MEMORANDUM FOR: D. A. Ward, Chairman, ACRS Subcommittee on Plant Features Important to Safety

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PURPOSE:

The purpose of the meeting was for the Subcommittee to discuss with the NRC Staff the definitions of the terms, "safety grade," "safety related," and "important to safety" as developed for testimony related to the Three Mile Island, Unit 1 restart, as well as review the generic implications of the use of these definitions in the licensing process. The NRC Staff has asked for an ACRS opinion regarding these definitions and related implications regarding design of nuclear power plant systems.

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1. Mr. Ward noted in his opening remarks that as a result of contentions in the TMI-1 restart hearings, the Staff has found it necessary, as well as helpful, in organizing its own thinking to develop concise definitions for the terms: "important to safety," "safety grade," and "safety related."

The term "important to safety" is found in 10 CFR 50, Appendix A of the General Design Criteria. The term applies to those structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

The term "safety grade" is not explicitly used in the regulations, but its usage as applied by the Staff is derived from 10 CFR 100, Appendix A. It includes structures, systems, and components (designed to remain functional for the Safe Shutdown Earthquake) necessary to assure (1) the integrity of the reactor coolant pressure boundary, (2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guidelines in 10 CFR 100.

The term "safety related" is defined in the regulations (10 CFR 50, Appendix B) in the context of quality assurance program requirements. The term is used in Regulatory Guides and the Standard Review

Plan in contexts other than quality assurance. In the Q.A. context, OSD has proposed a change to the regulations that would establish "safety-related" as equivalent to "important to safety". NRR has opposed the OSD proposal because, in other than the QA context, "safety-related" has been widely-used as equivalent to "safety-grade." At this point, the definition has not been finally decided. Mr. Ward noted that, in general, safety grade is a subset of important to safety.

Mr. Ward saw as a parallel, if not the same issue, the question of a graded quality assurance system. The Staff has expressed some unhappiness with industry's all or nothing approach to quality assurance. Quality assurance philosophers, in general, would like to see quality assurance applied commensurate with risk. This suggests defining subsets of "important to safety," as one way of starting a graded quality assurance approach. This then serves as a tie-in between the definitions of terms and quality assurance categories.

Mr. Ward noted that the Subcommittee should consider (1) whether to concur with a set of well thought out semantics as proposed by the Staff or (2) whether to work with the Staff to develop definitions of a more comprehensive nature which could have some impact on how systems are designed and evaluated in the future. He noted there was a spectrum of positions the Subcommittee could adopt in between.

The staff's immediate aim (i.e. obtain ACRS concurrence in the definitions set forth in JHK's TMI testimony and in the 1/29/81 Ross to Denton letter. would be a longer-term goal to be pursued in conjunction with the development of methods for ranking SSC's with respect to degree of importance to safety and appropriately grading Q.A. programs

(... 1/29/81 ... Ross to Denton for further detail)

2. Mr. Conran noted that converstationally, the Staff tends to use the terms, safety grade, safety related, and important to safety interchangeably a great deal. The terms do however have considerably different meanings in the regulations and regulatory guidance. The Staff's objective at the meeting was to discuss the two terms that the Staff has defined in the course of the TMI-1 restart hearing that is, safety grade and important to safety, and ask for Committee comments, if any, or concurrence if the Committee sees nothing wrong with the way the terms are defined. Mr. Conran noted the Staff has not arrived at a single definition of the term safety related.

3. Mr. Bender noted that most ~~of~~ equipment at a nuclear power plant has some relationship to safety. It is the type of relationship that must be addressed. Mr. Bender suggested that there is a need to establish how to descriminate between safety relationships that require certain kinds of engineering provisions, special design treatment, or possibly operational treatment that is different from what would occur under conventional practice.

4. Mr. Conran noted that the Rogovin study had said: "The NRC lacks definitions for safety-related as applied to equipment, systems, structures, and so forth necessary to ensure that Appendix B Quality Assurance standards are implemented consistently. The consequence has been an ad hoc uncontrolled application of safety-related requirements to equipment outside

~~Subsequent~~ As discussed with you in our telcon last week, NRR/OSD/ELD ~~have~~ have reached agreement on a single definition of safety-related (this happened subsequent to the 2/3/81 subcommittee meeting) OSD has agreed to our (NRR) 1/29/81 comments & "alternative" proposed and are now preparing the 10 CFR 50 App. A & App. B changes proposed by NRR.

the reactor protection system and engineered safety features systems." This problem was addressed in the NRC Action Plan in Section I.F. The approach is to expand the "Q" list to cover all equipment important to safety, not just structures, components, or systems used to prevent or mitigate accidents. A second aspect of the plan is to rank equipment in order of its importance to safety. There are preliminary steps underway toward developing a graded quality assurance program.

5. Mr. Conran noted that the term, "important to safety" encompasses the broad class of plant features, covered (not necessarily explicitly) in the General Design Critera, that contribute in important ways to the safe operation and the protection of the public in all phases and aspects of facility operation (i.e., normal operation and transient control, as well as accident prevention and mitigation).

6. Mr. Haass explained that the Quality Assurance Branch uses the term, "safety related" to define? those items on the Q-list. Those items on the Q-list include items considered safety-grade (seismic Category 1) plus other systems considered important to safety ~~and requiring special requirements~~ such as radioactive waste systems and fire protection systems. Licensees are ~~also~~ free to include such additional items on the list, even if the Staff doesn't consider the additional systems ~~safety related~~. In general, the Q-list for each plant is composed on a case-by-case basis.

"in connection with" ... "Yes" may be

required for the critical safety functions identified in 10CFR100 App. A / Reg. Guide 1.29

7. Mr. Bender suggested that in setting quality assurance requirements, consideration should be given to a piece of equipment's purpose and the conditions under which it must operate. Agreed!

8. The Staff suggested in discussing the term, "important to safety" that there is a relationship to the consequences to the plant given a particular component fails. The more severe the consequences of a component's failure the more the assurance needed to lower the probability of the component failing.

9. Since the accident at TMI-2, the Staff noted that the list of safety grade equipment has not been expanded. However, there have been upgrades to the reliability of components important to safety such as the power supply to the pressurizer heaters and PORV position indication; and components involved in such upgradings have been added to the "Q" list.

10. Mr. Bender suggested a set of definitions as follows:

- Importance to safety is a measure of the consequences of failure.
- Safety grade is a measure of quality needed to serve a safety function.
- Safety related refers to the conditions under which the safety function is to be performed.

We agree that this is a sensible approach and preferable semantically (i.e. from the view point of common-sense usage of the terms) to the set of definitions currently in use. The main drawback in going to this set of definitions on a short-term basis is the truly enormous amount of editorial effort required to incorporate these definitions into existing SRPs and Reg. Guides. The set of definitions put forth in JTCs TMI-1 testimony and in the 1/29/81 letter (Ross to Denton) have been established by practice and would not require significant editorial effort.

No! Sounds like groups are exclusive of each other. Haass agrees that "safety-related" is a subset of "important to safety".

11. Mr. Haass explained that the Quality Assurance Branch for the purposes of 10 CFR 50, Appendix B applicability separate plant structures, systems, and components into two separate groups -- safety related and important to safety. The safety related grouping contains those structures, systems, and components needed to prevent or mitigate the consequences of postulated accidents as defined by 10 CFR 50, Appendix B and Regulatory Guide 1.29. QA controls satisfy Appendix B and it is required that they be applied in a manner consistent with an item's importance to safety as stated in Criterion 2 of Appendix B. Items important to safety are those remaining structures, systems, and components in the plant that have some effect on safety (needed to provide reasonable assurance that the facility can be operated without undue risk. Quality assurance controls satisfy General Design Criterion 1 of Appendix A (the Staff has not developed detailed requirements for such a QA program).

this part is OK

12. Mr. Haass noted that the Staff is proposing for the future to clarify the applicability of 10 CFR 50, Appendix B to all items important to safety. The basis for this action is derived from Appendix A to 10 CFR 50. Currently, the Staff does not have such a list. The TMI Action Plan describes such a list. The Staff has issued a position to TMI-1, Zion 1&2, and Indian Point 2&3 to develop an expanded Q-list to include all structures, systems, and components important to safety.

But we do have the basis for such a list already. It would include structures, systems, and components identified explicitly in (a) the General Design Criteria (b) the SRPs and (c) the Reg. Guides.

14. Mr. Gallagher, who chairs an ad hoc group that was established through a joint agreement with the NRC Office of of Standards Development and the IEEE, made a brief presentation. The scope of this group (IEEE P827) is to prepare a document that sets criterion for determining the level of importance to safety of the instrumentation, control, and electrical portions of nuclear power generating station systems not covered by IEEE Std. 603. Methods are provided for determining the design basis for each of these systems and for determining the degree of applicability of the requirements of other standards to each of these systems. This determination is based on the level of importance to safety of each system.

The purpose of the document to be prepared by the group is to present a uniform classification approach for determining the applicability of design criteria and design requirements for nuclear power generating station systems, based on the level of their importance to safety.

The basic thought was to develop a graded approach. In this light, requirements already in place could be judged for applicability, in some cases restrictions could be relaxed if safety functions wer not as important with respect to the consequences of failure.

14. Mr. Medeiros from the NRC Office of Standards Development made a brief statement. He said it was his opinion that there is a lack of technical excellence in the area of plant control. He was also disturbed at the level of review for instrumentation and control equipment. He noted control room design needs attention.

FUTURE MEETINGS:

A Subcommittee Chairman's Report is currently scheduled for the March 1981 ACRS meeting, March 12-14, 1981.

Part 2-4

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

August 12, 1980

Mr. William J. Dircks, Acting Executive
Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: CASCADING FAILURES IN NUCLEAR PLANTS

Dear Mr. Dircks:

The Committee has, in the recent past, had occasion to address several matters which may have had accident or failure "cascades" as a common element. The Committee has been increasingly concerned that this aspect has not always had the early and vigorous attention that it warrants when it has arisen either in the course of a licensing review or as the result of analysis of operating events.

In general, a cascade may be visualized as a series of failures each occurring as a consequence of some previous event which gave rise to a set of conditions (environmental, electrical, mechanical, etc.) not originally considered in the design. As a rule, the later failures in such sequences tend not to be considered in the same depth, if at all, as those occurring earliest, even though they may be causally related. Examples are:

- The potential environmental effects of operation of the PORV and block valves operated in a bleed-feed mode, on equipment in containment, and in particular on the power and control circuitry associated with those same valves;

- The potential for BWR containment overpressurization due to failure of a safety/relief valve discharge line as a result of sustained flow at resonance conditions through a stuck-open relief valve (the initial failure);

- The consequences of an instrument line failure if this small break LOCA can also lead to a loss of control or safety function. Generally, instrument line failure analyses stop with evaluation of the resulting SBLOCA;

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- The effects on containment electrical penetrations of "post-accident" conditions within containment which could cause overcurrent or short-circuit conditions of non-IE equipment therein. This should be considered in light of the nonqualified nature of much of the equipment currently used to clear such faults; and

- The consequences of failure of an HPCI steam supply line, outboard of the isolation valves in that line, particularly in light of the probable effects of such a break on these valves and their controls.

In NUREG-0572, "Review of Licensee Event Reports (1976-1978)," the Committee observed in a discussion of Systems Interaction,

> "Redundancy and defense in depth are widely used in essential reactor systems to assure their availability. Implicit in such usage is the assumption that a high degree of independence exists between the redundant elements (or the various echelons of defense in depth). Occasionally an LER discloses an unintentional or previously unrecognized interdependence between such elements. ... Because of the potentially serious implications of such situations, more attention needs to be directed to seeking them out."

The Committee believes that many considerations of failure consequences are often either unrealistically narrow or are not investigated at all if they appear to have obvious primary effects which are supported by a general analysis. The instrument line failure is a good example.

The Committee recognizes that this is a complex subject and that any decision on an approach to requiring the consideration of cascades as the rule rather than the exception will require a great deal of study and interpretation. We expect, therefore, to have our Subcommittee on Safety Philosophy, Technology and Criteria begin in the near future to schedule discussions for consideration of these matters. The Committee would appreciate your identifying for us appropriate points of contact within the NRC Staff for this purpose.

Sincerely,

Milton S. Plesset

Milton S. Plesset
Chairman