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ACRS - 2054

MINUTES OF THE  
ACRS SUBCOMMITTEE MEETING ON  
GENERIC ITEMS  
DECEMBER 8, 1982  
WASHINGTON, DC

INTRODUCTION

The ACRS Subcommittee on Generic Items held a meeting on December 8, 1982 at 1717 H Street, N.W., Washington, D.C. The purpose of this meeting was to discuss the following:

- ° Methodology used by the NRC Staff in the Prioritization of Generic Safety Issues.
- ° Priority rankings proposed by the NRC Staff for various Generic Safety Issues in the Draft NUREG-0933, "A Prioritization of Generic Safety Issues", dated November 10, 1982.

The entire meeting was open to public attendance. Mr. Sam Duraiswamy was the Designated Federal Employee for the meeting. A list of documents submitted to the Subcommittee is included in Attachment A.

ATTENDEES

ACRS: M. Bender (Subcommittee Chairman), C. P. Siess, D. Okrent, J. J. Ray, D. W. Moeller, P. G. Shewmon (Part Time), S. Duraiswamy (Designated Federal Employee)

Principal

NRC Speakers: W. Minners, M. Ernst, W. Milstead, and G. Sege

EXECUTIVE SESSION

Mr. Bender, the Subcommittee Chairman, convened the meeting at 8:00 a.m. and reviewed briefly the schedule for the meeting. He said that the Subcommittee had received neither written comments nor requests for time to make oral statements from members of the public.

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Prior to holding discussions with the NRC Staff, Mr. Bender provided a brief preamble, indicating that the NRC Staff has been involved in prioritizing the generic safety issues for quite sometime. The NRC Staff's plan for early resolution of generic safety issues included in SECY 81-513 was presented to the full Committee during the December 10-12, 1981 ACRS meeting. The Methodology proposed in SECY 81-513 for use in the prioritization of generic safety issues has been modified by the NRC Staff. Based on the modified methodology, the NRC Staff has prioritized certain generic safety issues and included the priority rankings in Draft NUREG-0933. He said that the NRC Staff plans to present to the Subcommittee the modified Methodology as well as the results of the application of the Methodology to individual generic safety issues.

PRESENTATION BY THE NRC STAFF - MR. W. MINNERS

Mr. Minners said that the NRC Staff has a program plan for the management of generic safety issues which includes the following elements:

- ° Identification of Generic Safety Issues
- ° Prioritization
- ° Allocation of NRC Resources
- ° Review and Approval
- ° Implementation

He said that the "Prioritization" element in the program management plan is an important one since it will help to identify those safety issues that have a high potential for reducing risk, and also to assist in allocating resources for resolving such issues in a timely and efficient manner.

Mr. Minners said that the Draft NUREG-0933 document includes priority rankings only for those generic safety issues that are assigned to the Office of Nuclear Reactor Regulation (NRR) for resolution. These items include generic safety issues identified prior to the start of FY 1982, Task Action Plan Items, and unresolved TMI Action Plan Items. Other Generic Issues for which NRR is not responsible for resolution are being prioritized and the priority rankings for such issues will be included in a Supplement to NUREG-0933.

Mr. Ray asked how they plan to keep track of the non-NRR issues (issues for which NRR is not responsible for resolution). Mr. Minners responded that this issue has not been thought out in detail and, at the present time they do not have any method for tracking non-NRR issues.

Mr. Ray suggested that it would be helpful if they keep one centralized document including NRR as well as non-NRR issues.

Mr. Ernst said that he believes that the Executive Director for Operations (EDO) wants to set up an overall tracking system consolidating all of the generic issues.

Dr. Siess asked whether generic issues are strictly an NRR problem. Mr. Minners responded that in his opinion, generic issues are primarily an NRR problem.

Dr. Siess asked whether those generic issues that require some sort of research for resolution are included in NUREG-0933. Mr. Minners responded that there are not too many generic issues that need research for resolution. He believes that by definition a generic issue does not require research; if it requires research, it will be called research project.

Dr. Siess commented that it is not a proper distinction. Some generic issues can get resolved without research. Others like A-41 "Long Term Seismic Program" requires research from the beginning.

Mr. Bender commented that he does not believe that the ACRS ever concurred in such a definition. Further, separating the generic issues as NRR issues and non-NRR issues seems to imply that there is more than one regulatory agency.

Mr. Minners discussed briefly the schedule for the prioritization of NRR generic safety issues (Attachment B, page 1). He said that the Draft NUREG-0933 document which includes proposed priority rankings of the NRR generic issues will be issued for public comment in the middle of December 1982 and comments will be sought on the Methodology as well as the results

of the application of the Methodology. Any comments received from the public will be considered, as appropriate.

Mr. Minners discussed briefly the steps followed in the prioritization process (Attachment B, page 2). He mentioned that defining a generic issue was the most difficult and time consuming step in the prioritization process. He said that the prioritization of several generic issues that require technical analysis was assigned to Pacific Northwest Laboratories (PNL). The results of their effort were included in the Draft NUREG/CR-2800 document.

Mr. Minners said that during the prioritization process, they have identified certain issues that did not fall clearly into the category of generic safety issues. These have been listed as "Licensing Improvement" or "Environmental" issues and are being assessed separately. He mentioned that resolution of these Licensing Improvement issues is expected to provide input to revise the Standard Review Plan, Regulatory Guides, etc., and also to increase the efficiency of the licensing process.

Dr. Koeller asked whether the NRC Staff has considered the traumatic injuries to workers resulting from some mechanistic forces such as hydrogen explosion in the prioritization process. Mr. Minners responded that they have considered radiation hazards to workers in their prioritization effort, but not injuries to workers because the Commission is not authorized to deal with that issue.

Mr. Minners discussed the Methodology used by the NRC Staff in its prioritization of the generic safety issues (Attachment B, pages 3-6). He said that the method of assigning priority rankings involves two primary elements: the estimated safety importance of the issue, and the estimated cost of developing and implementing a resolution. To the extent reasonably possible, quantitative estimates were made of the projected worthwhileness of resolving a generic safety issue by calculating a Value-Impact Score that reflects the relation between the risk-reduction value expected to be achieved and the associated cost impact. The Value-Impact Score was calculated by using the following formula:

$$\text{Value-Impact Score, } S = \frac{\text{Safety Benefit}}{\text{Cost}}$$

Where,

Safety Benefit is the estimated risk reduction (event frequency x public dose averted) that is achieved, and Cost is that thought necessary to develop and implement a resolution in the number of plants involved. The total cost includes both the costs of developing the generic solution, which are typically NRC costs, and the costs of implementation of the solution in all affected plants, which includes design, equipment, installation, test, operation, maintenance, and plant downtime, and are typically industry costs. He said that the plant downtime cost used in the analysis was about \$300,000/day.

The scoring computation used in determining the Value-Impact Score of a specific generic issues is:

$$S = \frac{NFTD}{C} \text{ man-rem/million dollars}$$

Where,

- N - Number of reactors involved.
- T - Average remaining life of the affected plants, in years.
- F - Accident frequency reduction, in events/reactor-year.
- D - Public dose from the radioactive material released from containment, in man-rem.
- C - Total cost, in millions of dollars.

Dr. Siess and Mr. Ray commented that the plant downtime cost of \$300,000/day used in the analysis seems to be very low. Mr. Minners said that this figure was obtained from a report done by DOE in 1981.

Mr. Bender commented that the one billion dollars assumed for plant replacement cost seems to be very low.

Mr. Minners said that best estimates of the Safety Benefit parameter were done by using event-tree or fault-tree techniques or by using the information provided in WASH-1400 as a basis. He stated that the dose rate to the public was calculated by using the CRAC-2 code with the following input parameters:

- ° WASH-1400 source term
- ° Braidwood nuclear plant site meteorology

The calculated doses were adjusted to reflect the mean of the population density (340 people/square mile) within a 50-mile radius of the nuclear plants.

Mr. Minners said that the criteria and estimating process on which the priority rankings are based are neither rigorous nor precise. Other considerations such as occupational dose, averted plant damage from a postulated accident, and professional judgment were used in arriving at a sound priority ranking, or adjusting the tentative formula-derived ranking. He said that considerable application of professional judgment, sometimes guided by good information but often tenuously based, occurs at a number of stages in the prioritization process. He mentioned that professional judgment played a major role in assessing priorities for issues in the human factors' area.

Mr. Minners discussed briefly the categories used in the prioritization process, indicating that four categories of priorities were used; HIGH, MEDIUM, LOW, and DROP. He said that since several people were involved in assigning priority rankings, they had used the guidelines included in the Commission's Safety Goal Policy in order to achieve consistency in ranking. A chart showing how the tentative priority rankings are derived from the safety importance of an issue is included in Attachment B, page 7.

Mr. Minners said that assignment of a HIGH priority means that an important safety deficiency is involved and strong efforts to achieve an earliest practical resolution are necessary. A MEDIUM priority means that no safety deficiency demanding high priority attention is involved, but there is believed to be potential for safety improvements or reductions in uncertainty of analysis that may be substantial or worthwhile. Efforts at resolution for such issues

should be planned, perhaps over the next several years, but without interfering with the efforts for resolving a high-priority issue. A LOW priority means that no safety deficiencies demanding at least MEDIUM-priority attention are involved, and the DROP category covers issues that are without merit or whose significance is clearly negligible.

Mr. Minners said that they are recommending that the issues listed under the LOW and DROP categories be combined and that no further work be done by the NRC Staff for resolving these issues. However, they plan to keep these issues in the file, and in the future, if someone can demonstrate that some of these issues are important and need to be reassessed, then they will reconsider the rankings assigned to such issues.

Indicating that although some members of the NRC Staff have been telling that the absolute value of risk or the likelihood of core melt should not be used as a vital input in the decisionmaking, the Study (Draft NUREG/CR-2800) performed by PNL for prioritizing certain generic issues uses the results of WASH-1400 or some Probabilistic Risk Assessment techniques as an important input in deciding whether certain issues are dominant contributors to risk. He asked whether this approach by PNL is compatible with what some members of the NRC Staff have been telling. Mr. Minners responded that since they have a limited amount of time, they have to use some sort of standardized approach. He believes that a standardized approach may not apply to all cases. However, any mistakes made in the application of a standardized procedure may be picked up during the peer-review process.

Dr. Okrent asked how the averted-plant-damage factor included under "other considerations" is used in the prioritization process. Mr. Minners said that this factor has not always been automatically used in the prioritization process. He said that the priority ranking is based mainly on the safety significance of an issue. However, under certain circumstances, they have used other considerations to either upgrade or downgrade the formula-based tentative priority ranking of an issue.

Dr. Okrent felt that the role of "other considerations" in the prioritization process is not made clear.

ACTION EXPECTED OF THE ACRS

Mr. Minners requested that the ACRS review and report on the following:

- ° Adequacy of the Methodology used in the prioritization of generic safety issues.
- ° Adequacy of the application of the Methodology to individual generic safety issues.

Dr. Siess asked whether the NRC Staff wants the ACRS views on the application of the professional judgment in the prioritization process. Mr. Minners said that they would like to have ACRS comments on the application of the Methodology including the application of the professional judgment.

With reference to the NRC Staff's proposal to drop the Turbine Missiles issue from further consideration, Dr. Okrent asked if the NRC Staff feels that the Turbine Missiles issue is not important to be pursued, why did they ask the applicants to change the orientation of the turbine from tangential to peninsular. Mr. Minners responded that this issue is evaluated on the basis of the existing requirements in this area, and not based on what they did in the past.

Dr. Okrent asked whether they have any technical basis to justify their conclusion on the Turbine Missiles issue. Mr. Minners said that they do not have any more information other than that in Draft NUREG-0933. He added that the Staff's conclusions on some other issues are also not justified by analyses; because of the time constraint, they have to use professional judgment to arrive at a conclusion on certain issues.

Dr. Okrent said that the NRC Staff should provide the ACRS with copies of background documents for all the generic issues prioritized in the Draft NUREG-0933 for use in reviewing these issues.



Mr. Minners said that he will provide as much background information as he can to facilitate the ACRS' review.

Dr. Okrent commented that, in his opinion, the cost estimates used by the Staff for plant downtime, cleanup, and replacement seem to be very low. He believes that the psychological impact from an event would be very large so that the man-rem factor used to assess the safety significance may not be a good measure.

Dr. Moeller asked whether there is consensus among the NRC Staff on the proposed priority rankings. Mr. Minners said that there is consensus on about 99% of the issues. The differing opinions among the Staff on the remainder of the issues are documented in Draft NUREG-0933.

Mr. Bender proposed the following approach for performing the ACRS review of the prioritization of generic issues:

- ° ACRS review can be performed at two separate phases. In Phase I, the ACRS can review and comment on the Methodology used by the NRC Staff in the prioritization process. This Phase may be completed in January 1983.

In Phase II, the ACRS can review and comment on the application of the Methodology to individual issues. The items prioritized in Draft NUREG-0933 will be assigned to various ACRS members, and with the help of cognizant ACRS Staff Engineers, and ACRS Fellows, the members can review and comment on the items assigned to them by March 1983.

Mr. Bender also suggested that one of the ACRS Fellows be assigned to evaluate the Methodology with respect to its sensitivity and uncertainties. The findings and recommendations of the ACRS Fellow will be discussed at the next Subcommittee meeting on the Generic Items.

The Subcommittee did not raise any objection to the approach proposed by Mr. Bender.

Mr. Bender said that the Subcommittee may also want to think about the following:

- ° Should a Methodology be used at all in prioritizing issues?
- ° If a Methodology is used, should it be used with any qualification?
- ° Are there other criteria that can be used in prioritizing the generic issues?

Mr. Bender thanked all participants and adjourned the meeting at 9:50 a.m.

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NOTE: Additional details can be obtained from the transcript located in the Public Document Room, 1717 H Street, N.W., Washington, D.C. 20555 or from Alderson Reporting, Inc., 400 Virginia Avenue, S.W. Washington, D.C. (202) 554-2345.

LIST OF DOCUMENTS SUBMITTED  
TO THE SUBCOMMITTEE

1. Draft NUREG-0933, "A Pricritizationof Generic Safety Issues".
2. Presentation Material by W. Minners, "Prioritization by Generic Safety Issues".

SCHEDULE FOR PRIORITIZATION OF NRR GENERIC ISSUES

1. TMI ACTION PLAN ITEM IV.E.2 (5-80)
2. SECY-81-513 (8-81)
3. ACRS LETTER ACCEPTING STAFF'S LIST (3-17-81)
4. ACRS BRIEFING ON SECY-81-513 (12-81)
5. PRELIMINARY REPORT (3-26-82)
6. COMMISSION BRIEFING (4-13-82)
7. DRAFT REPORT ON NRR ISSUES, NUREG-0933  
(9-30-82)
8. FEDERAL REGISTER NOTICE FOR PUBLIC  
COMMENT (12-15-82)
9. MEET WITH ACRS (1-7-83)
10. SUBMIT REPORT TO EDO (1-21-83)
11. MEET WITH COMMISSIONERS (2-21-83)
12. PUBLISH NUREG-0933 (3-21-83)
13. PRIORITIZATION OF NEW GENERIC ISSUES  
IDENTIFIED BY ALL OFFICES

PROCESS

1. IDENTIFY ALL ISSUES
  - SOURCES - NRR, ACRS, AEOD, OIE
2. ASSIGN ISSUES
  - SPEB
  - CONTRACTOR ASSISTANCE FROM PNL (NUREG/CR-2800)
3. DEFINE ISSUES BY CONSULTING WITH LEAD NRR ORGANIZATIONS
4. PRIORITIZE SAFETY ISSUES USING DEFINED METHODOLOGY
5. IDENTIFY NON-SAFETY ISSUES FOR SEPARATE PRIORITIZATION
  - LICENSING IMPROVEMENT
  - ENVIRONMENTAL
6. CIRCULATE PRODUCT FOR NRR PEER-REVIEW
7. ACRS REVIEW
8. SCHEDULE RESOLUTION OF HIGH PRIORITY ISSUES IDENTIFIED BY PROCESS
9. PUBLIC COMMENT

SAFETY BENEFIT

1. CHANGE IN FREQUENCY, F (EVENTS/R<sub>Y</sub>)
  - SPECIFIC EVENT / FAULT TREE
  - WASH-1400 (SPEB)
  - OCONEE 3 AND GRAND GULF 1 RSSMAP (PNL)
  - DATA - LERS, PRAS, JUDGMENT (HUMAN FACTORS)
  
2. CHANGE IN CONSEQUENCE, D (MAN-REM/EVENT)
  - SOURCE TERM: SPECIFIC ESTIMATE,  
WASH-1400 RELEASE CATEGORIES
  
  - DOSE : CRAC 2 - TYPICAL METEOROLOGY  
(BRAIDWOOD), MEAN POPULATION  
DENSITY (340 PEOPLE/SQ. ML.),  
50-MILE RADIUS

## CHANGE IN RISK

$$\Delta R = (\Delta F)(\Delta D)(L)(N)$$

WHERE  $\Delta F$  = FREQUENCY  
 $\Delta D$  = DOSE  
 $L$  = REMAINING LIFE  
 $N$  = NUMBER OF REACTORS

## COST

$$C = C_I N + C_R$$

WHERE  $C_I$  = INDUSTRY IMPLEMENTATION COST  
 $N$  = NUMBER OF REACTORS  
 $C_R$  = NRC COST

## SAFETY PRIORITY SCORE

$$S_i = \frac{\Delta R}{C}$$

IMPLEMENTATION COST, C (\$MILLION) ?

1. INDUSTRY COST
  - DESIGN, INSTALLATION, MAINTENANCE: STUDIES  
ACTUAL  
INDUSTRY ESTIMATE  
NRC ESTIMATE
  - DOWNTIME  
\$300/DAY    \$ 200K/Day
2. NRC COST
  - RESOLVE, IMPLEMENT, MONITOR

IMPLEMENTATION COST, C (\$ MILLION) ?

1. INDUSTRY COST

- DESIGN, INSTALLATION, MAINTENANCE: STUDIES

ACTUAL

INDUSTRY ESTIMATE

NRC ESTIMATE

- DOWNTIME

\$300/DAY    \$ 300K/Day

2. NRC COST

- RESOLVE, IMPLEMENT, MONITOR

CHANGE IN RISK

$$\Delta R = (\Delta F)(\Delta D)(L)(N)$$

WHERE

$\Delta F$  = FREQUENCY

$\Delta D$  = DOSE

L = REMAINING LIFE

N = NUMBER OF REACTORS

COST

$$C = C_I N + C_R$$

WHERE

$C_I$  = INDUSTRY IMPLEMENTATION COST

N = NUMBER OF REACTORS

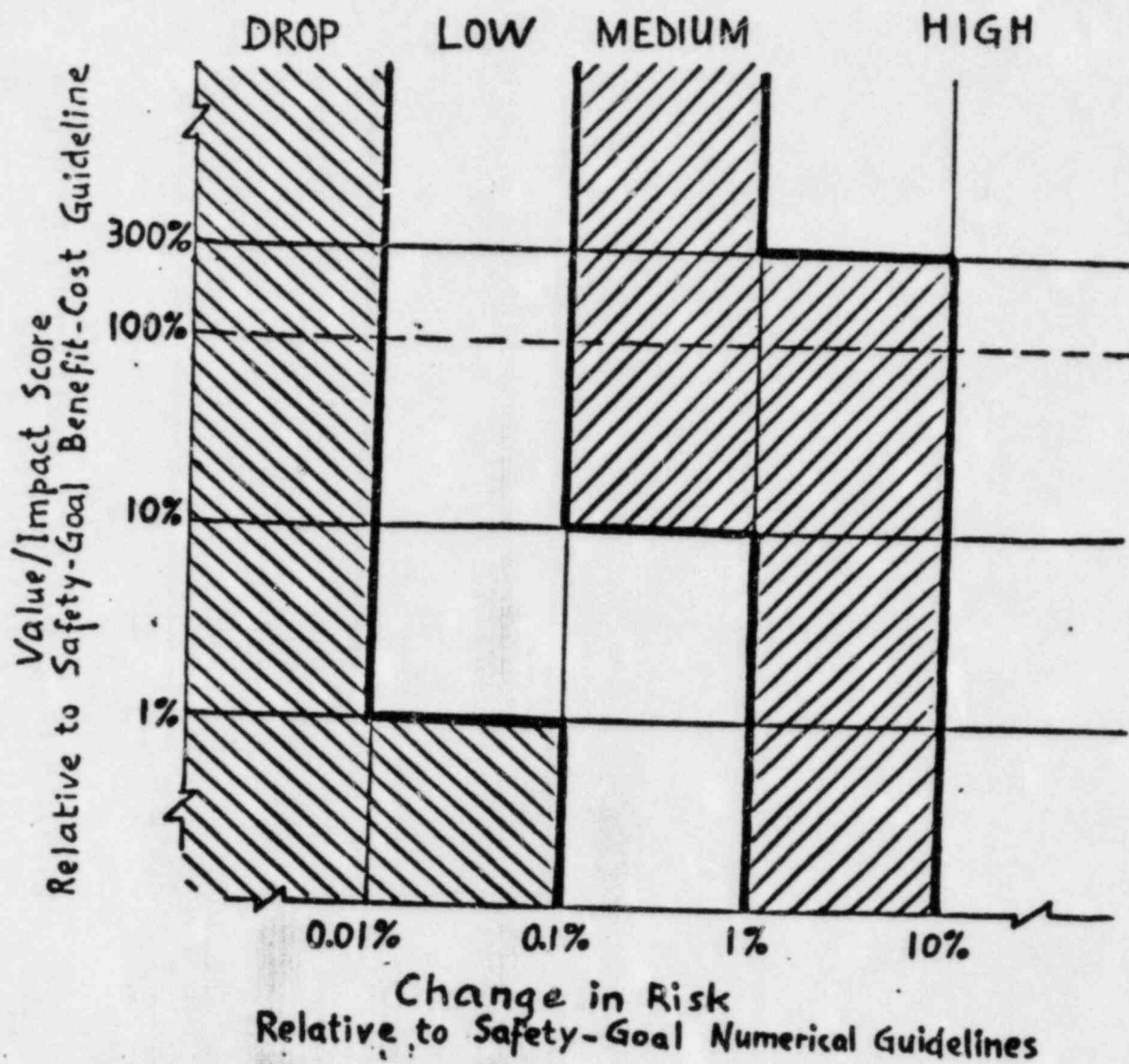
$C_R$  = NRC COST

SAFETY PRIORITY SCORE

$$S_i = \frac{\Delta R}{\dots}$$



POTENTIAL GENERIC ISSUES  
SAFETY PRIORITY RANKING CRITERIA



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OTHER CONSIDERATIONS

1. OCCUPATIONAL DOSE.
2. AVERTED PLANT DAMAGE
  - CLEANUP - \$400 MILLION
  - REPLACEMENT - \$1,000 MILLION

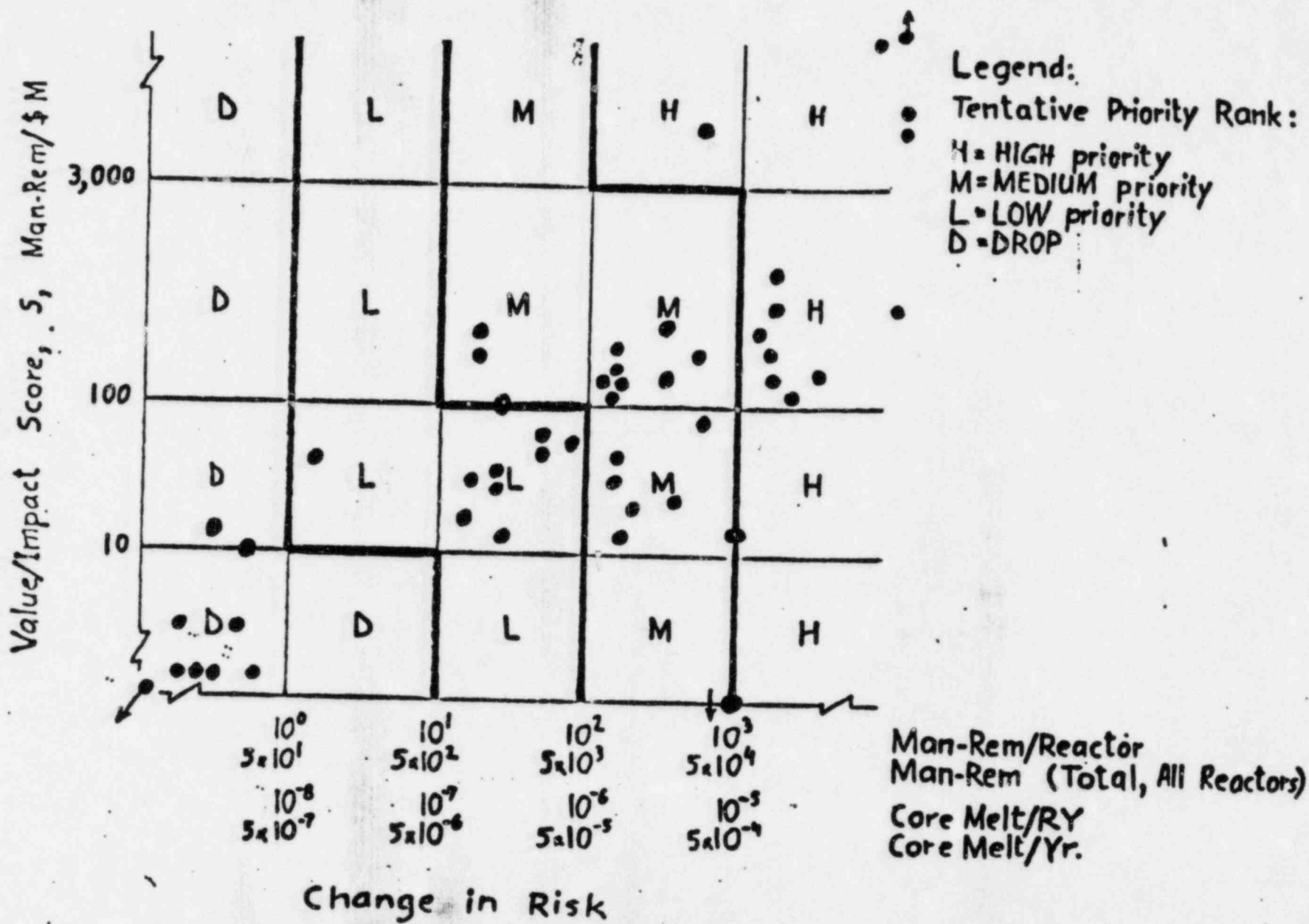


Figure 1 - Priority Ranking

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