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PROPOSED RULE

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Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Domestic Licensing of Production and Utilization Facilities;
Operational Data Gathering. Comments on Advance Notice of
Proposed Rulemaking

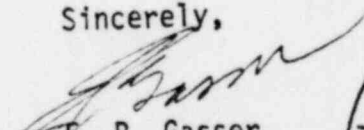
Dear Secretary:

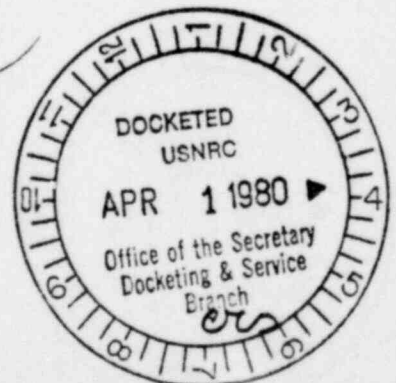
Gasser Associates is pleased to provide the Commission with specific comments and recommendations regarding the proposed rulemaking that would make licensee participation in the Nuclear Plant Reliability Data System (NPRDS) mandatory. By way of introduction we would like to point out that Gasser Associates has provided technical assistance to ten nuclear power units with the NPRDS and are about to start our eleventh project. This assistance has included defining the reportable scope, compiling and reporting equipment engineering data, and preparing reports of equipment failure. Gasser Associates has prepared more than 40,000 Reports of Engineering Data (Form NPRD-2/2A) for our utility clients. We believe that our substantial experience with the NPRDS clearly qualifies us to comment on the proposed rulemaking.

We have divided our response, included as Attachment 1 to this letter, into three parts. The first part presents an action plan that we feel should be implemented prior to any NRC rulemaking process. This action plan is a direct challenge primarily to the utility industry to develop answers to some important and longstanding questions regarding the future use and management of the NPRDS. The second part of our response includes answers to the twenty-one questions put forth by the NRC in the notice of proposed rulemaking. Finally, the last part includes specific comments regarding the content of the proposed rule presently being considered by the NRC.

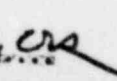
If the NRC is interested in discussing our comments with us, we would be pleased to meet with the appropriate individuals.

Sincerely,


E. R. Gasser
President



Enclosure

Acknowledged by card 4-1-80, 

Attachment 1

Part I

Proposed Action Plan

No one can deny that the present record of participation in the NPRDS leaves a lot to be desired. There are inconsistencies in the reportable scope from one plant to the next (see Figure 1) and a low level of commitment to reporting system and component failures to the NPRDS (see Figure 2). The principal reason for this in Gasser Associates' opinion is that at the plant level an already overburdened staff simply does not have much time for tasks which are considered to be "low priority." The remedy to this situation is not to redefine artificially the priority of the NPRDS by making a rule requiring participation. The remedy is to examine the reasons why plant operating and maintenance organizations consistently place such a low value on NPRDS participation and then to either remove these reasons as excuses for non-participation or abandon the NPRDS if its inherent value is truly low from a cost/benefit standpoint. This is the main thrust of the action plan proposed by Gasser Associates and illustrated in Figure 3. The key elements of the plan are described in the following paragraphs.

Action Item #1 - Responsibility is Assumed for Evaluation of the Use of the NPRDS

Gasser Associates strongly believes, based on our many years of experience working with nuclear plant operating staffs, that if the uses and benefits of the NPRDS are significant and, almost more importantly, can be effectively communicated to those staffs then full and meaningful participation can be achieved with a minimum of coercion. It is indeed unfortunate that since the inception of the NPRDS in 1972 very little effort has been made to develop generic programs and procedures that could be used by individual utilities to evaluate both their own failure data and data from the industry as a whole. In addition there has been almost no demonstrated interest on the part of the utility industry in assigning full-time responsibility to a single organization or group for the analysis of NPRDS data. Likewise, the NRC which has assumed a position somewhat critical of the industry has also been delinquent in using the data that has been readily available to it. One almost begins to wonder if the apparent preoccupation with data collection and reporting is not somehow symptomatic of a general lack of training and experience throughout the industry in system and equipment malfunction and failure analysis.

To remedy this situation Gasser Associates recommends that a single organizational group assume responsibility in the immediate future for an in-depth evaluation of the present and potential uses of the NPRDS. NPRDS use should be viewed in terms of both plant design and operation reliability improvement. NPRDS use should also be defined for both individual organizations (e.g. individual plants or vendors) and for the nuclear industry as a whole. There are a number of organizations that could assume the responsibility to define the value of the NPRDS. These include EPRI, specifically the Institute of Nuclear Power Operations (INPO), the ANSI N18-20 Subcommittee, EEI, the

Figure 1

DISTRIBUTION OF UNITS BY NUMBER OF COMPONENT REPORTS (NPRD-2)
IN THE NPRDS DATA BASE AS OF NOVEMBER 26, 1979

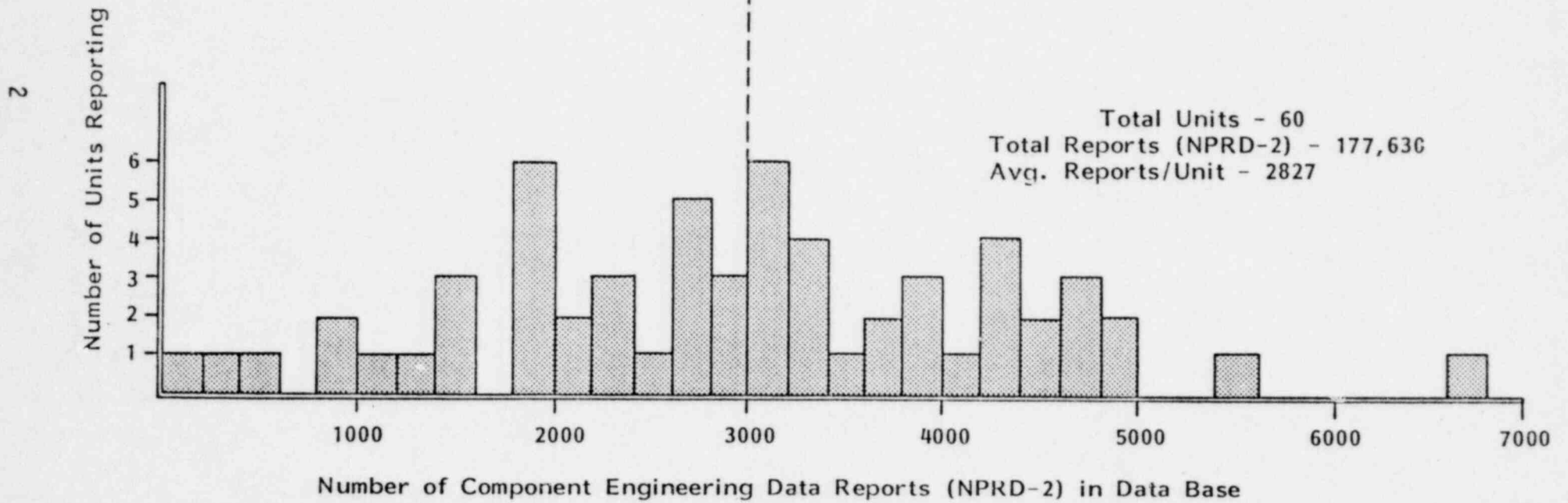
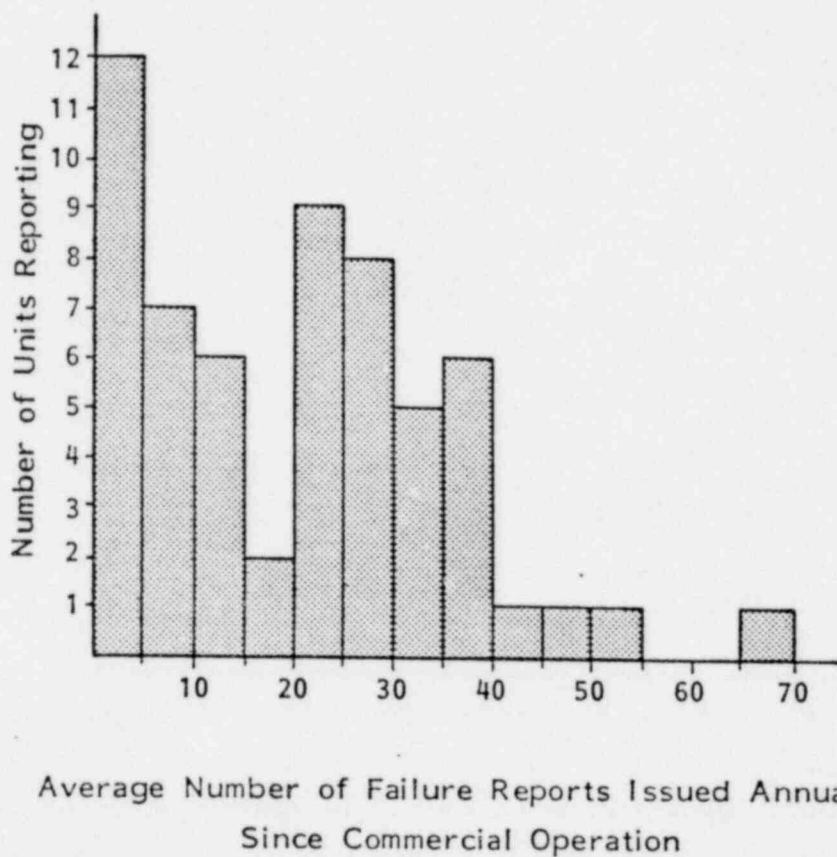


Figure 2

DISTRIBUTION OF UNITS BY AVERAGE NUMBER OF FAILURE REPORTS (NPRD-4) ISSUED ANNUALLY^{1 2}

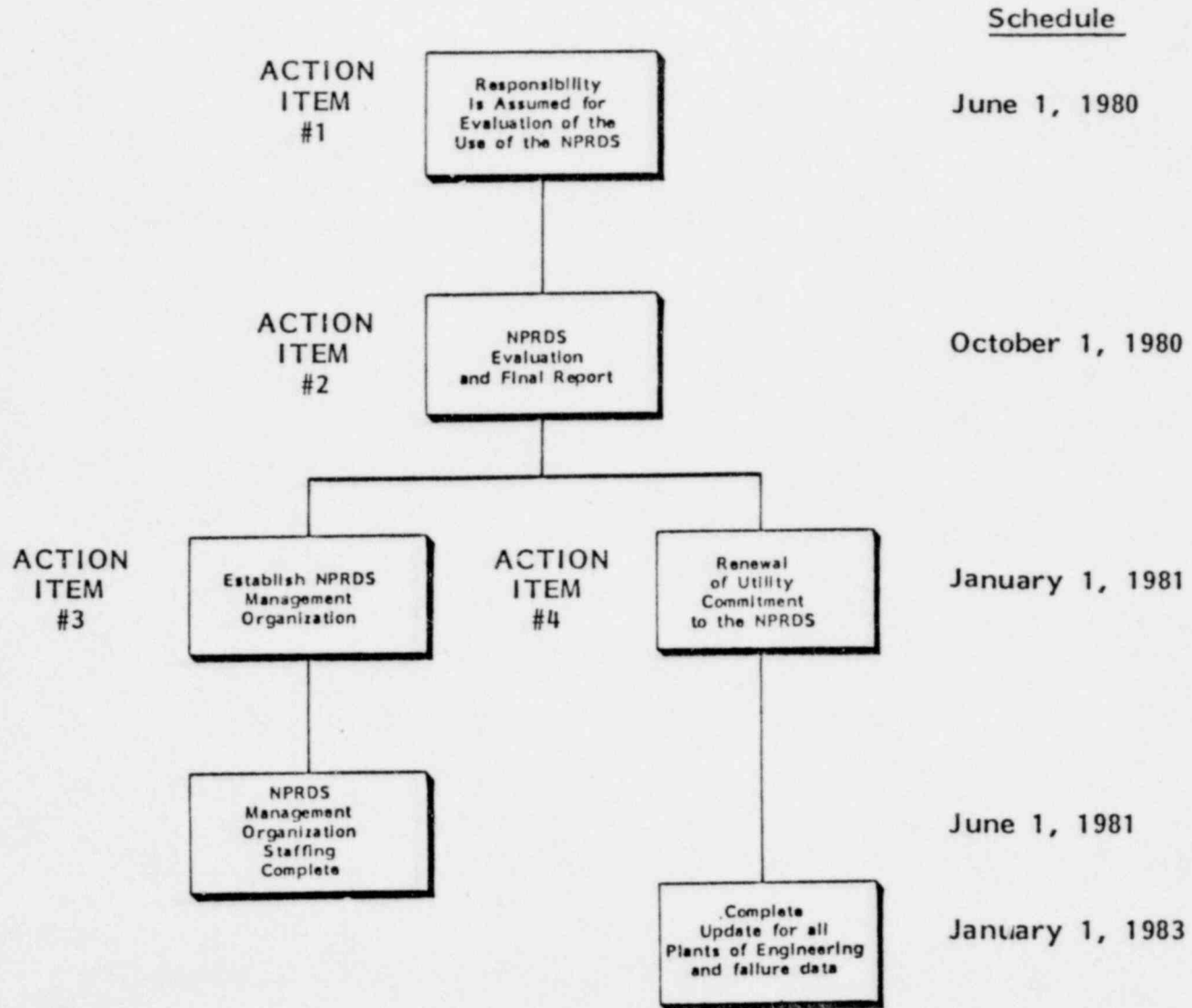


Notes:

- ¹ Basis is NPRDS Status Report as of November 26, 1979.
- ² Failure report issuance rates for all plants were normalized to a component engineering data base of 3000 components.

Figure 3

PROPOSED ACTION PLAN



National Electric Reliability Council (NERC) and the NRC. It is Gasser Associates' recommendation that NSAC assume this responsibility. The NSAC staff should be supported in this effort by individuals from all segments of the industry including NSSS vendors, architect-engineers, equipment vendors, the NRC, and consultants.

Gasser Associates recommends that the industry impose a deadline upon itself for assigning responsibility for the evaluation of the uses of the NPRDS. A reasonable deadline would be June 1, 1980.

Action Item #2 - NPRDS Evaluation and Report

The organization (e.g. NSAC) that assumes responsibility for evaluation of the uses of the NPRDS should complete its evaluation and issue a final report by October 1, 1980. The evaluation should focus on the uses of the data base, present and future, both by plant designers to improve design reliability and by plant operators to improve operations reliability of installed systems and equipment. With regard to design reliability it is not unreasonable to require that the organization responsible for the evaluation outline specific programs and procedures that could be used to analyze NPRDS data on both a generic and plant specific basis. With regard to operational reliability, specific relationships between the NPRDS data base and, for example, plant surveillance testing, preventive maintenance, spare parts, and design change programs should be developed, if possible. Plant operations personnel must be able to read the final report of the NPRDS evaluation and identify the specific procedures that should be followed to analyze the data and apply it to their plants. These procedures should include evaluations of different reports that can be prepared from the data base, a description of the techniques that can be used for plotting and analyzing data, and a discussion of the conclusions that might be drawn from the analysis of NPRDS data and how those conclusions can be applied in practical terms to everyday plant activities. Every effort must be made to demonstrate to those responsible for data collection how the NPRDS can be used by them in a meaningful way.

An evaluation of the NPRDS can lead to one of two conclusions; namely, either the NPRDS is of value to the industry even if some modification to the program is necessary, or, the NPRDS is of inconsequential value even with substantial modification. The organization responsible for the NPRDS evaluation must arrive at one of these conclusions with sufficient evidence and logic to ensure that either the NPRDS moves forward with vigor or is dropped.

The NPRDS evaluation effort recommended by Gasser Associates should be highly visible. The results obtained should be effectively communicated to the rest of the industry, in particular, to the staffs at each operating plant who are responsible for data collection, reporting, and evaluation. Regional seminars to review the results of the evaluation would be appropriate.

Action Item #3 - Establish NPRDS Management Organization

In Gasser Associates' opinion, many of the problems that have plagued the NPRDS to-date have been related to the fact that there is no single full-time organization with responsibility for and authority over the collection, and

more significantly, the analysis of NPRDS data, the definition and interpretation of program requirements, and the verification of program implementation. The NPRDS cannot, in our opinion, be managed effectively by a committee that has very little authority over program participants and is not actively involved on a full-time basis.

Gasser Associates recommends that the management responsibility for the NPRDS be assigned to a single organization as illustrated in Figure 4. This NPRDS Management Organization should be divided into two sections; namely, a Design Reliability Section (DRS) and an Operations Reliability Section (ORS). The DRS should be responsible for evaluation of NPRDS data as it relates to nuclear plant system and component design. In this role the DRS would be a focal point for utilities designing new plants and modifying existing plants, NSSS vendors and vendors of critical items of plant equipment, architect-engineers, and the NRC. The DRS could be assigned, for example, the following responsibilities and duties:

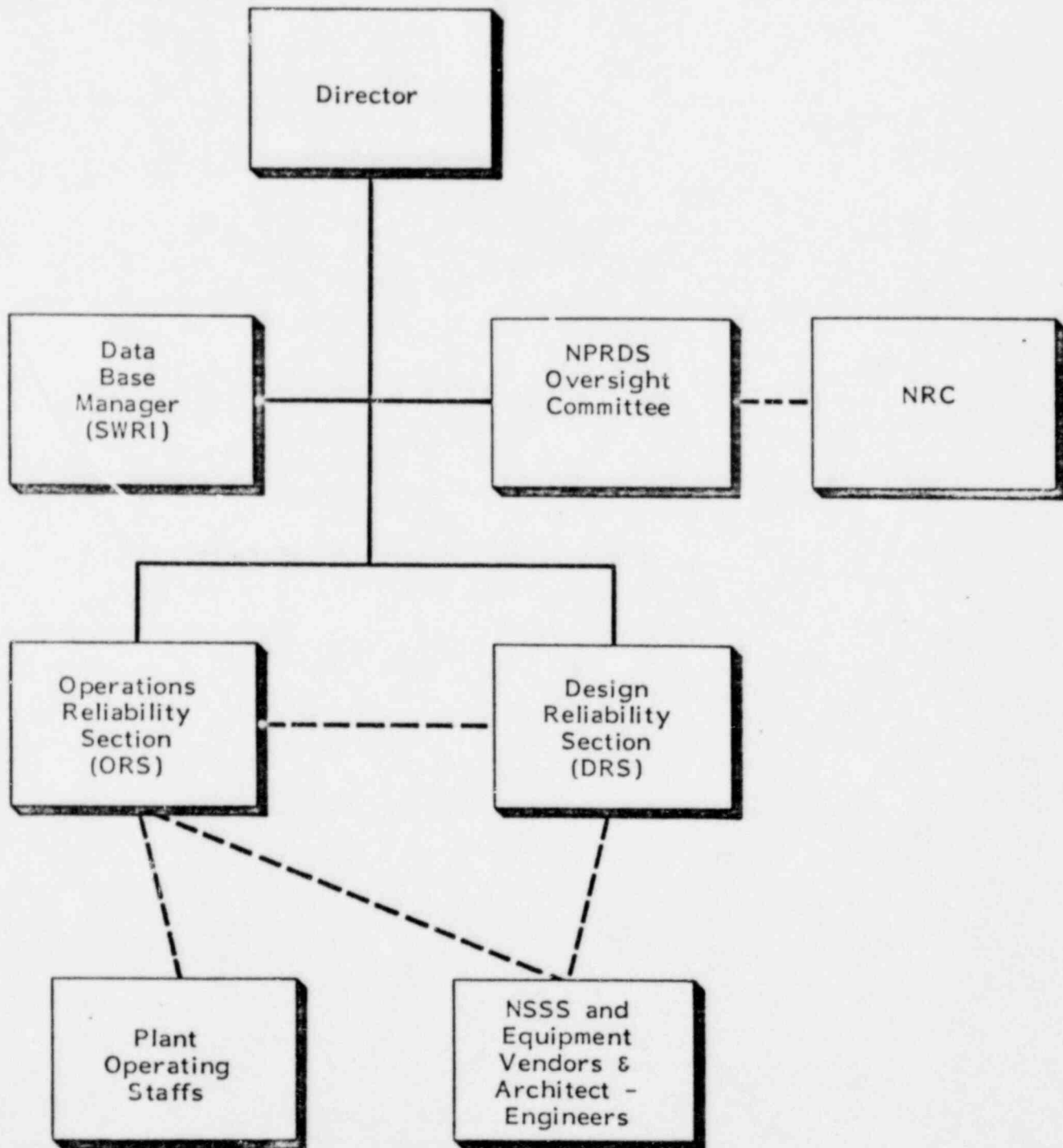
- a. Develop and maintain current a "reliability manual" similar in concept and form to IEEE Std 500-1977. The reliability manual would address both systems and equipment (mechanical, electrical and I&C) and would eventually become the single best source of reliability statistical data for nuclear power plants.
- b. Perform system design reliability analyses in conjunction with NSSS's, AE's and the NRC.
- c. Perform WASH-1400 type analyses of nuclear plant safety.
- d. Develop standardized reliability specifications for critical equipment and explore methods that can be used for obtaining realistic reliability warranties from equipment suppliers.

An overall objective of the DRS would be to improve the design reliability of nuclear power plants. The DRS would rely heavily on NPRDS data and could be expected to require changes to the system as experience with its use grew. Requests for changes would be submitted to an Oversight Committee which would weigh the costs and benefits of the proposed change and decide on its implementation. This committee would include members from all segments of the industry including utilities, NSSS vendors, architect/engineers, consultants, and the NRC.

The role of the ORS would be to help plants in operation improve their reliability of operation. Gasser Associates feels very strongly that the ORS should be staffed with experienced plant operation and maintenance personnel. These must be individuals with actual hands-on experience with power plant equipment. They must have the ability to "read between the lines" of problem descriptions submitted to the NPRDS and analyze problem causes and evaluate corrective actions. An ideal ORS would be staffed with very experienced (e.g. over twenty years) plant operations and maintenance personnel having both fossil and nuclear plant experience. We would go so far as to recommend that the ORS staff include a number of former plant operation or maintenance superintendents who may be close to retirement or in retirement but still active enough to share their years of experience on either a full or part-time basis.

Figure 4

PROPOSED NPRDS MANAGEMENT ORGANIZATION



Primary Communication lines - - - -

Gasser Associates views the ORS as the key to the future of the NPRDS. Plant personnel responsible for implementation and use of the NPRDS must be able to identify an organizational group that is working for them and with them. In particular, the ORS would provide needed support with the following tasks which for the most part are generic to all operating plants:

- a. Develop maintenance recommendations on either a generic basis by, for example, plant system or equipment type, or on a specific basis by manufacturer model number. These PM recommendations would be developed primarily for equipment that have poor records of performance as evidenced by NPRDS reports of failure.
- b. Investigate poor performance trends with reporting plants and equipment vendors.
- c. Publish notices of potential equipment problems for distribution to operating plants. Coordinate such reports with the NRC's Inspection and Enforcement Branch and their issuance of IE Bulletins, Circulars, and Information Notices.
- d. Develop programs and procedures that can be used by individual plants for evaluation of equipment problems including root cause analysis and performance trending.
- e. Develop and hold training seminars and workshops related to plant equipment performance evaluation and failure analysis. This would be of particular value to Shift Technical Advisors and/or other members of the plant staff responsible for failure and trend analysis.
- f. Perform special investigations of system and equipment performance problems as may be requested by individual operating plants.
- g. Develop spare parts inventory recommendations based on equipment performance data submitted to the NPRDS.
- h. Develop a ranking system for manufacturers of specific components based on population and failure data in the NPRDS. Use the results of these evaluations to persuade specific vendors to take corrective actions.
- i. Publish reports of investigations and evaluations of NPRDS data for distribution to the industry.
- j. Focus on identifying weaknesses in operation and maintenance personnel qualifications and training and develop specific action plans that individual plants can use to improve personnel performance.

The ORS, like the DRS, could be expected to require changes to the NPRDS as experience with its use grew. Such change requests would also be submitted

to the Oversight Committee for approval.

With regard to the operational control of the NPRDS (e.g. data base computerization, NPRDS Reporting Procedures Manual updates and distribution, computer searches and reports, etc.) Gasser Associates feels that Southwest Research, Inc. has the experience and record of performance to continue in this role.

With regard to the NPRDS Management Organization (i.e. the DRS, ORS and the Oversight Committee) there are many choices of existing organizations that could assume this role. Choices include EPRI, specifically NSAC and/or INPO, EEI, the NRC, an independent contractor, to name a few. Many of these groups have recently expressed their intention to assume some of the responsibilities described earlier. Our view is that responsibility for the management of the NPRDS should rest with a single group which can be held accountable by the industry and the NRC for the effectiveness and use of the system. Given a choice, Gasser Associates would recommend EPRI's Nuclear Safety Analysis Center (NSAC). We would suggest a change in the name, however, to Nuclear Reliability Analysis Center to better reflect its charge which, in our opinion, should include improved plant design and operation performance from both a safety and electricity generation standpoint.

Gasser Associates recommends that the NPRDS Management Organization be established by January 1, 1981. Staff should be in place for both the DRS and the ORS by June 1, 1981. Establishment of the NPRDS Management Organization is predicated, however, on the evaluation of the NPRDS and a conclusion that the program should go forward.

Action Item #4 - Renewal of Utility Commitment to the NPRDS

Assuming that it can be concluded based on the evaluation of the NPRDS that the program should be continued, a renewal of utility commitment to the NPRDS will be required. This renewal should include a recognition of the authority of the NPRDS Management Organization to define and interpret the reportable scope of the NPRDS engineering data base on a plant-by-plant basis and to define and interpret requirements for documenting and reporting system and equipment failures. The NPRDS commitment renewal made by each utility should be acknowledged by both corporate and plant management.

Assuming that the NPRDS Management Organization is established by the proposed deadline of January 1, 1981, the renewal of each utility's commitment to the NPRDS should be made by the same date. A commitment should also be made to update each plant's data base (engineering and failure) within a period of two years, i.e., by January 1, 1983, in accordance with program requirements and guidelines to be developed by the NPRDS Management Organization.

Attachment 1 (cont'd)

Part II

Answers to NRC Questions

The notice of proposed rulemaking included twenty-one questions prepared by the NRC for review and comment by the industry. This part includes Gasser Associates' recommendations regarding the points raised in these questions.

Q1. How should NPRDS effort be apportioned between improving plant availability and improving plant safety? Where should the emphasis be?

A1. Gasser Associates feels that this question cannot be answered until an in-depth evaluation is made of the uses of the NPRDS. If this evaluation reveals that the NPRDS is of significant value with respect to improving plant design and operation reliability then obviously the program should address all those systems and components that are of critical importance to both plant safety and productivity. If, on the other hand, the evaluation of the uses of the NPRDS reveals only a limited usefulness then the program should be dropped or the reportable scope redefined such that the costs of data collection are more in proportion to the expected benefits of the program. In either case it is time that the input to the NPRDS, in terms of data collection and reporting, be defined in terms of the specific output expected from the program. It is foolhardy to continue to collect data with the hope that someday someone will find a good use for it. If that good use exists today then let's define it, publish it, and evaluate it in a full and open forum before changing the data collection program.

Q2. How should NPRDS data be used by industry, the public and the NRC to achieve this emphasis? What other uses, if any, should be made of NPRDS data?

A2. The fact that this question has to be asked is the prime reason that the NPRDS is under scrutiny at the present time. To date, no single group has answered this question. This includes the NRC which has had NPRDS data available to it for many years but, like most other organizations, has done little with it. Gasser Associates recommends that a single organization assume responsibility for answering this question from both a plant design reliability and plant operation reliability standpoint. If the answer, which should be subject to industry review, indicates minimal usefulness of the NPRDS then the program should be dropped or drastically overhauled. If the answer is positive, Gasser Associates feels certain that the industry will embrace the system wholeheartedly and the entire question of making NPRDS mandatory will be moot. The key point is that a single organization be responsible for this determination and that its responsibility in this regard be highly visible.

Q3. How should NPRDS data be gathered and analyzed to facilitate recommended uses?

A3. Assuming that the recommended evaluation of the uses of the NPRDS concludes that the program is worthwhile, Gasser Associates feels that the present method of data gathering and reporting should be continued. An option that could be considered for gathering equipment engineering data would be to let the proposed NPRDS Management Organization assume responsibility for defining the reportable scope at each plant and managing data collection. The latter could be accomplished by personnel assigned full-time to the NPRDS Management Organization or through contracts for data collection made with the Management Organization. The benefits of this approach would be increased consistency in the reportable scope between plants and better data quality achieved by using NPRDS experienced personnel for all data collection.

In addition to data gathering Gasser Associates also recommends that the NPRDS Management Organization assume prime responsibility for the analysis of NPRDS data. The large majority of analyses that can conceivably be performed using the NPRDS are generic in nature. One reason the NPRDS has not measured up to expectations is the failure of the industry to designate a single group as responsible for data analysis. The ANSI N18-20 Subcommittee has focused its attention primarily on the mechanics of data collection, storage, retrieval and reporting but has not shown signs of assuming responsibility for data analysis. If responsibility for data analysis is not assumed by a single industry-oriented organization on a full-time basis, the utility industry should anticipate that the NRC will assume that responsibility probably through its new Office for Analysis and Evaluation of Operational Data. This assumption of responsibility will in all likelihood include management control over program design and implementation.

Q4. Who should alert appropriate persons concerning problems uncovered from analysis of NPRDS data? Who should initiate design, maintenance, or operating improvements?

A4. The NPRDS Management Organization recommended by Gasser Associates should have central responsibility for analyzing NPRDS data and alerting plant owners, the NRC and vendors of problems. The NRC, besides being a member of the Oversight Committee, would be responsible for independent technical reviews and audits of the NPRDS management organization's activities and audit of implementation at individual plants. Design, maintenance, or operating improvements considered by the NRC to require mandatory implementation could be enforced through IE Bulletins or other appropriate mechanisms available within the licensing process.

Q5. What systematic analysis is conducted currently by licensees and the public? To what extent and for what purpose should each licensee, the NRC and the public analyze data?

A5. Measured in terms of published results little analysis, systematic or otherwise, of NPRDS data appears to be performed by licensees, the public or the NRC. Since most analyses of NPRDS data would be of general interest to most elements of the nuclear industry, Gasser Associates feels that prime responsibility for performing such analyses should rest with a single organization. This organization, described earlier, should have representatives from all elements of the industry. Since the analyses would in all probability address both safety and non-safety problems, this single organization should not be the NRC.

Q6. If NPRDS reporting is made mandatory, what form of NPRDS management (i.e. industry, NRC or joint industry/NRC) will best lead to fully responsive reporting and to meaningful analysis?

A6. Gasser Associates recommends that an NPRDS Management Organization similar to that described in Part I of our response be established. The proposed NPRDS Management Organization should, in Gasser Associates' opinion, be part of EPRI. Specifically, Gasser Associates recommends that NPRDS management responsibility be assigned to the NSAC. The NPRDS Management Organization would include an Oversight Committee which should include representatives from utilities, NSSS vendors, equipment vendors, architect-engineers, the NRC, and consultants. The NPRDS Management Organization would have the responsibility and authority to ensure full and adequate participation by each plant and would be held accountable by the industry and the NRC for the useful analysis of NPRDS data and the communication of the results of those analyses to the industry and the public.

Gasser Associates recommends that the NRC's responsibilities for the NPRDS include independent technical review and audit. The independent technical review function should involve reviews of analyses performed by the NPRDS Management Organization. These reviews could be performed by the recently established Office for Analysis and Evaluation of Operational Data (OAEOD). Individuals from the OAEOD could work directly with the NPRDS Management Organization and would be members of the Oversight Committee. The NRC could also conduct audits of plant participation in the NPRDS and ensure that failures are properly documented and reported.

Q7. To what extent, if any, should the NRC manage NPRDS reporting and data analysis?

A7. The NRC may argue that industry has not exercised its management responsibilities in the past for the NPRDS and that this is justification for the NRC to assume this responsibility. Gasser Associates believes that most of the problems with the NPRDS are tied to the fact that no one, including the NRC, has proven conclusively that worthwhile analyses of NPRDS data can or cannot be performed. In our opinion the NRC shares as much responsibility as any other industry group for the present low level of interest in the NPRDS.

The NRC is not free, therefore, to stand in judgment of industry's past performance regarding NPRDS management and is certainly in no position to conclude that management of the program by a federal agency will automatically improve its usefulness. In all likelihood management of the NPRDS by the NRC would result in significantly increased program costs to both utilities and the public without a corresponding increase in usefulness of the system.

Q8. If NPRDS reporting is made mandatory, how should the NRC inspect and enforce mandatory licensee participation? Should licensees be subject to enforcement penalties for noncompliance with NPRDS requirements?

A8. First, NPRDS reporting should not be made mandatory so long as industry adequately responds to what has become a clear requirement to improve the overall management of the NPRDS. It should be noted that Gasser Associates' recommendations for the NPRDS Management Organization provide for NRC involvement on the Oversight Committee. We have also recommended in our response to Question #6 that the NRC assume responsibility for the independent technical review and audit of NPRDS program effectiveness and implementation. Problems would be communicated to the NPRDS Management Organization for resolution. Failure of the NPRDS Management Organization to correct problems identified by the NRC could lead to a requirement for mandatory participation.

It should be pointed out that mandatory participation in the NPRDS could be accomplished without a rule change to 10CFR50. An alternative would be for the NRC to issue a Regulatory Guide describing what it considered to be an acceptable method of implementing requirements for documenting and reporting significant conditions adverse to quality described in Criterion XVI, "Corrective Action," of 10CFR50, Appendix B. Use of a Regulatory Guide would provide the NRC an opportunity to clarify NPRDS reporting procedures if needed. The Regulatory Guide could also include recommendations regarding how such data should be analyzed and the results applied to the solution of practical problems. The NRC could also clarify exactly what is meant by "significant conditions adverse to quality" so that plant staffs would have a clear understanding of what should be reported. Use of a Regulatory Guide would also provide individual plants the opportunity to propose alternative measures if, for example, it is clear that their participation in the NPRDS should be limited (e.g. older vintage plants).

Gasser Associates feels that a rule change, while impressive in terms of its public relations value to the NRC, is nevertheless the wrong way to improve participation in a program that, so far, no one has proven to be of significant benefit to the industry or the public from either a safety or plant productivity standpoint.

Q9. What improvements should be made to the NPRDS Manual or other guiding vehicle to enhance uniformity of reportable scope, completeness and

accuracy of reporting, and usability of the data?

A9. Gasser Associates has substantial experience with the use and interpretation of the NPRDS Reporting Procedures Manual. In general, we feel the manual is good although some improvements in the definition of reportable scope and what constitutes a failure are obviously needed. The details of these improvements should be addressed by the proposed NPRDS Management Organization. These are basically technical and administrative issues which should not be discussed in comments on a proposed rulemaking. Gasser Associates does have a major comment regarding the overall scope of the NPRDS Procedures Manual. Specifically, we recommend that the title of the manual be changed to "NPRDS Reporting and Data Analysis Procedures Manual" and that additional information be included spelling out the analyses of NPRDS data that can be performed and the methods that should be used. The revised manual should also describe how to use the results of such analyses to improve plant design, operation and maintenance. The fact that the revised manual might be considered by some to be an unesoteric "cookbook" does not daunt our feelings regarding its ultimate usefulness and value especially to plant operations personnel.

Q10. Any data gathering system needs feedback to maintain and upgrade system capability in the face of changing events, methodological advances, and other factors. Feedback is particularly necessary to modify data-gathering activity upon which the whole analytical system rests. What feedback features, if any, should be addressed by rule-making?

A10. Inherent in any question of feedback is the assumption that there is some single organization responsible for the management of the NPRDS and having the authority to effect changes in the program and ensure implementation. If Gasser Associates' recommendations for the NPRDS Management Organization are implemented feedback will take care of itself.

Q11. Should the NPRDS and LER systems be restructured to avoid overlapping data-gathering requirements or should present system formats be retained?

A11. Gasser Associates recommends that the Licensee Event Reports (LER's) be retained but that they be used principally for communicating information and data on major safety events to the NRC on a more immediate basis, for example, as required by the new section 10CFR50.72, "Notification of Significant Events." We would revise the LER form somewhat to reflect its primary purpose. For example, the LER should draw attention to circumstances and plant operating conditions surrounding an event, potential problems yet to be dealt with, corrective actions underway or proposed, etc. The NPRDS failure report form should be used more as a historical record of equipment problems, their causes as determined by evaluations and

analyses conducted after the failures, and the corrective actions finally decided upon as well as followup evaluations of the suitability of those corrective actions.

Q12. In the event you recommend eliminating duplication between LER and NPRDS reporting, how would you restructure each system's reporting requirements?

A12. See response to Q11.

Q13. Do you agree with the summary paragraph 2 estimate of a minimum of 3,500 components as an appropriate scope? Assuming a reportable scope of 3,500 components how many NPRDS failure reports should be expected per month per operating plant?

A13. The average value of the reportable scope for all plants could very well be between 3,000 - 3,500 components assuming a uniform interpretation of the NPRDS Reporting Procedures Manual. It should be noted, however, that significant variations can exist due to differences in plant type, vintage, number of shared systems for multiple unit stations, etc. Our experience tells us that it is not wise to put too much emphasis on so called "typical numbers" without tying those numbers to a specific plant. This, to be honest, is one of our chief fears about the possibility of the NRC assuming approval authority over each plant's reportable scope. There is too much chance of these approvals becoming a "numbers game" especially when the reviews and approvals will, in all likelihood, be done by NRC personnel located in Washington, D.C. In our experienced opinion it is virtually impossible to perform a meaningful evaluation of an NPRDS program without spending a considerable amount of time at the plant.

Gasser Associates' fear of the NPRDS reportable scope "numbers game" is substantiated in part by a study prepared by an NPRDS Working Group established by the NRC in 1977. This group recommended increasing the reportable scope to include all structures, systems, and components identified by NRC as important to safety. The Working Group went so far as to identify a list of systems that represented a good start for developing the necessary scope. Based on Gasser Associates' evaluation of this list, it is our opinion that the total number of components to be reported would be 6,000 - 7,000 if not more. Recent statements by the NRC regarding post-TMI actions that should be taken clearly indicate that the NRC would strongly favor this higher level of reporting. That being the case Gasser Associates questions the NRC's candor in the notice of proposed rule-making with respect to the ultimate size of the data base and the NRC's probable directions regarding reportable scope rule requirements. Unfortunately such lack of candor often raises suspicions in the nuclear industry regarding the NRC's ultimate intentions. The NPRDS has yet to be proven to be worth such intrigue.

With regard to failure reports there is insufficient data to play the numbers game at this time.

Q14. Should the scope of systems and components presently summarized by the NPRDS Manual be expanded or contracted and, if so, in what areas?

A14. Gasser Associates would prefer to leave the answer of this question to our proposed NPRDS Management Organization. It should be based on an evaluation of the true usefulness of the NPRDS. To expand the present scope of the NPRDS without being able to show specifically what will be done with the data and how those results will significantly contribute to improved safety and/or reliability is to compound the problem that presently exists with the NPRDS.

Q15. Do the costs of preparing and submitting failure reports differ between the LER and NPRDS systems? What do you estimate these costs to be?

A15. By all rights the cost for preparing each of these reports should not differ greatly since the same tasks are involved in developing the information to be reported. This information is very similar. However, it is a fact that most plant staffs will spend more time on LERs than NPRDS failure reports because of the licensing requirements, hence, priority, that applies to LER submittal. The cost of developing failure reports will vary greatly with the component involved, the nature of the failure, the experience of the individuals assigned to determine cause and corrective action, etc. If a conscientious evaluation of equipment failures is made, the cost can be substantial and can involve many different individuals or groups.

It should be emphasized that the cost of completing and submitting the forms, NPRDS or LER, is usually a small part of the costs to develop the information that is written on the form. It is important, therefore, when discussing costs to be absolutely sure of what tasks are included in the cost figure.

Q16. Are the per plant figures of \$75,000 to \$200,000 for one time development of NPRDS engineering data and \$50,000 for annual NPRDS reporting considered valid or are these figures understated or overstated?

A16. Gasser Associates has developed the NPRDS engineering data base for ten nuclear units. On average the total time involved in defining the reportable scope, collecting equipment data and preparing engineering data reports (Form NPRD-2/2A) is about 0.5 manhours per component. It should be noted, however, that this manhour figure is achieved by Gasser Associates' personnel very experienced with the NPRDS. Our data indicates that with inexperienced personnel time estimates are closer to 1.0 manhour per component and in some

cases have ranged as high as 2-3 manhours per component.

The cost for compiling engineering data for the NPRDS will depend on the experience of the individuals doing the work (i.e. their average per component data compilation time) and the cost for their time. Considering that some utilities have chosen to use inexperienced people for this work, the range of costs listed in the question is probably appropriate. It should be pointed out, however, that Gasser Associates' cost for providing all services necessary to develop the NPRDS engineering data base has never exceeded \$20 per component.

With regard to the impact of a future expansion of the reporting scope requirements, the NRC should be aware of the fact that the man-effort involved will not be insignificant. Consider, for example, the sixty operating plants presently participating in the NPRDS. A change in the reportable scope to about 7,000 components, a value not inconsistent with the NRC's present inclination to expand the data base to include all safety related equipment, would require the preparation of an additional 242,360 engineering data reports (NPRD-2). NPRDS experienced personnel assigned full time to the work would require, as a minimum, over sixty (60) man-years to complete this effort. Given the fact that this type of task is usually assigned by the utility to inexperienced people working part time, the actual effort could be at least twice this level, that is, more than 120 man-years. Note that these figures do not take into account the needs of plants that will enter into commercial operation in the next few years. Our estimate of the number of engineering data reports that will have to be prepared for these plants over the next three years is about 300,000. The man-effort involved will be anywhere between 75 and 150 man-years depending on the experience of the individuals assigned to the work. In terms of dollars the total cost to upgrade presently operating plants to 7,000 components each and to develop the data base for plants coming on line over the next three years could range from \$6-12 million depending on the experience of the individuals assigned to the work. It is important, therefore, to define clearly the uses of the NPRDS before requiring further data collection effort.

With respect to the second part of question Q16, \$50,000 per year per plant is unrealistically low if this cost is defined to include failure and trend analysis and determination of corrective actions. Preparation and submittal of the forms once this information is developed is the smallest part of the overall cost.

- Q17. What alternatives to mandatory reporting would provide the data necessary for complete and accurate reliability analyses and at what level of assurance?
- A17. Gasser Associates has described a reasonably specific alternative to mandatory reporting that we feel will provide a very high level of data quality. This alternative has not been tried yet and should be explored.

- Q18. Do the benefits to the utility and the public of improved availability and increased reactor safety warrant the cost of NPRDS or is there a less costly way to realize equivalent benefits in regulatory action?
- A18. This question cannot be answered until the benefits of the NPRDS are evaluated and defined in specific terms. This task should receive the highest priority from both the industry and NRC and should be done before any rule is imposed to make NPRDS mandatory.
- Q19. How should the NPRDS be funded? Should industry fund fully or should the NRC contribute funds to support the industry system?
- A19. Gasser Associates feels that the NPRDS should be funded by the utility industry primarily so that it can retain control over the collection, analysis and general use of the data. Data collection could be funded by each participant or through an organization such as EPRI which would contract for data collection services, principally engineering data. The latter approach could help ensure consistency, quality and timeliness in data collection. Gasser Associates does not feel the NRC should contribute funds to support the industry system. We do feel, however, that the NRC should provide people to work with the proposed NPRDS management organization and should assist with the review and evaluation of NPRDS data.
- Q20. Should the six early design plants, excluded when the NPRDS commenced, continue to be excluded or should all plants be required to participate?
- A20. Exclude the six plants. In addition, there are a number of other plants of an older vintage that might be dropped. This assessment could be made once the equipment engineering data base is updated and a determination can be made of the commonality of equipment.
- Q21. Certain operator errors must now be reported within the scope of the LER system. Furthermore, NPRDS reports sometime include corresponding human error information. To what extent, if any, should an improved NPRDS collect man-machine interface data and perform reliability analyses which consider human factors.
- A21. This aspect of the NPRDS should receive substantial attention during the evaluation of the uses of the NPRDS and the changes that could be made to improve its effectiveness. However it must be realized from the outset that there will be a tremendous reluctance on the part of the industry to report human errors whose cause is not directly related to man-machine interface problem. Human errors related to poor training or inadequate procedures, for example, might be reported if a special program can be set up that protects the anonymity of the reporting plant.

Attachment 1 (cont'd)

Part III

Comments on Proposed Rule

The notice of proposed rulemaking includes a summary of features being considered for the proposed rule. Gasser Associates feels that a new rule is not needed to improve participation in the NPRDS. Be that as it may we are providing comments on the features of the proposed rule presently under consideration.

1. The NRC would require each licensee operating a nuclear power plant to prepare a list of systems and components defining the scope of NPRDS reporting for its nuclear power plant.

This requirement would be an unnecessary part of a rule making participation in the NPRDS mandatory. The NRC's objectives should be to ensure that the NPRDS Reporting Procedures Manual requirements and guidelines are clear, well understood by program participants and, most importantly, are auditable.

2. The NRC would refer the licensee to the latest revision of Chapter 4 of NASI N18-20 Reporting Procedures Manual for the Nuclear Plant Reliability Data System (Manual), prepared by Southwest Research Institute, for guidance in developing the system and component scope list.

From a purely administrative standpoint a rule included in 10CFR50 should not make reference to a specific revision of the NPRDS Reporting Procedures Manual. A logical place for this would be a Regulatory Guide which could also be used by the NRC to provide any clarifications or interpretations of the Manual that may be needed to ensure reporting consistency and program auditability. In fact, Gasser Associates believes that in lieu of a rule change to 10CFR50 the NRC could issue a new Regulatory Guide describing an acceptable program for implementing requirements in 10CFR Appendix B, Criterion XVI, "Corrective Action." The Regulatory Guide could refer to the NPRDS Reporting Procedures Manual and provide any clarification to the reporting instructions the NRC felt appropriate. The use of a Regulatory Guide would be more in line with the NRC Commission's pre-TMI feelings that the NPRDS should not be made mandatory. The use of a Regulatory Guide would provide each plant the opportunity to justify its non-participation or limited participation in the NPRDS if warranted because of, for example, plant vintage.

3. The NRC would require each applicable licensee to submit its scope list to the Director, Office of Nuclear Reactor Regulation (NRR) for approval.

Gasser Associates recommends that if the NRC feels compelled to involve itself in the review of the NPRDS reportable scope for each plant that the responsibility be assigned to NRC Inspection and Enforcement personnel located in the field. The field location is critical to this type of review due to the accessibility of documentation and the actual equipment.

As a general comment we are concerned with the apparent naivete of the NRC with regard to the methods and problems associated with defining the NPRDS reportable scope and compiling equipment data. For example, the initial identification of the reportable boundaries can best be done by marking up a set of system flow diagrams. This definition is refined continuously throughout the data collection phase as interpretations are made regarding the reportability of certain components or subassemblies. An "approval" function carries no real meaning until the data collection phase is complete. At this point individuals who are familiar with the plant's systems and equipment (e.g. IE inspectors in the field) can review the final documentation and verify that the reported scope conforms to the reporting procedures requirements. However, even at this stage there can be many questions and differences of opinion regarding how or if a particular component is to be reported.

The NRC should consider what it intends to "approve" scope lists for. If such approval is intended to mean that the scope is in conformance with the NPRDS Manual as it presently exists the NRC will be in for a big surprise. If the NRC through its approval function intends to assume responsibility for interpretation of those requirements then it might as well assume total responsibility for the management of the program including the collection of the data.

Gasser Associates would like to propose that if NRR feels compelled to "approve" scope lists Gasser Associates can provide NRR with typical scope lists from actual plants so that NRR personnel can have a trial-run at their approval function. At the end of the trial-run NRR should report the costs involved in the review and the results achieved. If, as our experience indicates, the benefit/cost ratio of NRR's direct involvement proves to be low this idea should be dropped. If, on the other hand, NRR personnel can demonstrate that a significant contribution can be made by reviewing equipment lists in Washington, D.C. than we are sure that such reviews will be welcomed by the industry. Our point is, try it first before making a rule.

4. The NRC would require each applicable licensee to file Reports of Engineering Data, as described in Chapter 9 of the Manual, within approximately one year after notification of NRR approval of the scope list.

We strongly disagree with the need for NRR approval of scope lists. With regard to a deadline for updating the NPRDS data base Gasser Associates has proposed an action plan that we believe is reasonable. This plan calls for a renewal of utility commitment to full participation in the program by January 1, 1981, and completion of the data base update by January 1, 1983. It should be noted that many plants are planning or are in the process of expanding their equipment data base for reasons not directly related to the NPRDS. The one year requirement could in some cases seriously disrupt existing project schedules and manpower assignments. The NRC should show some flexibility where adequate justification can be provided for extending the deadline.

5. From the date the scope list is submitted to NRR for approval, the NRC would require each applicable licensee to file, within approximately one month of a failure, Reports of Failure as described in Chapter 11 of the Manual.

Gasser Associates recommends that the NPRDS reporting procedures manual which should be the guiding document be changed to permit failure reports to be submitted quarterly. We have found from experience that a greater degree of data quality control can be achieved if failure reports can be reviewed and clarified on a batch basis prior to submittal to SWRI. The extra time also helps ensure that the failure reports have been properly closed out with regard to determination of cause and corrective action. It provides an opportunity for the final reviewer to investigate reports that are poorly written or misleading.

Another aspect of reporting frequency is related to the analysis of the data. If it can be shown that the value of the analysis of NPRDS data available in the data base is significantly dependent on the speed with which data is submitted following a failure then Gasser Associates will change its recommendation. Otherwise, requirements for submittal of failure data should be based primarily on achieving high data quality.

6. The NRC would request that the NPRDS manual be upgraded to establish a standard reportable scope and instructions for consistent reporting or would otherwise establish such standardization.

It could be concluded based on the wide variation in the number of components reported by different plants to the NPRDS that the Manual is inadequate. Gasser Associates, having completed the data base for ten nuclear units, cannot entirely support this conclusion. The Manual, in our opinion, definitely needs some clarification. However, by and large, our personnel have not had difficulty in implementing the instructions. It is our feeling that the variation in plant data base size is due primarily to factors other than interpretation of reporting requirements. Chief among these is the failure of individual participants to see any significant end use for the data that they must compile. Apart from what we agree is a need for certain clarifications in the Manual, Gasser Associates has reservations regarding the NRC's interest in upgrading the Manual to "establish a standard reportable scope." In the notice of proposed rulemaking, it was noted that at least 3,500 components would comprise an appropriate scope. Based on Gasser Associates' experience, we concur with this average value estimate if one only considers safety class 1 and 2 and electrical class 1E components. However, if all safety related systems and components are included the reportable scope will increase to between 6,000 - 7,000 components and probably more. This was, in fact, the recommendation made by an NRC Working Group assigned in June, 1977 to evaluate the NPRDS. In light of TMI and the many NRC pronouncements made since regarding the importance of reliability data for all safety equipment and some non-safety equipment it is hard to believe that the NRC does not intend to require an increase in the reportable scope. That being the case one can question the NRC's candor in its notice of proposed rulemaking. If there is truly no intention of changing the present reporting requirements then there is little need, for example, to submit lists of systems and components to the NRC for review. Half of all operating plants have already established data bases in excess of 3,000 components per unit. On the other hand, if the NRC intends to increase the reportable scope the public should know this now, not after the rule is developed.

7. The NRC would require the utilities to participate meaningfully. Based on public response to questions which follow concerning industry, public and NRC end use of NPRDS data, adequacy of utility participation will be judged. From the hundreds of component problems that occur each year at each power plant, the NRC would decide which ones were sufficiently important to safety or availability to cause an NPRDS failure report to be written.

We cannot determine how the above relates to a feature of the proposed rule; therefore no comment.

8. The NRC would consider reducing LER reporting by eliminating the requirement for LER reports for most component failures or malfunctions covered by the NPRDS; the NRC would consider requiring equipment LER's only for those component failures or malfunctions that are of major safety significance.

Gasser Associates concurs with this recommendation especially in light of the recent amendment to 10CFR dealing with notification of significant events. If the NRC decides to pursue this course of action, Gasser Associates recommends that the LER form be modified to better suit its purpose of immediate notification.

9. See comments under #8.