NRC PDR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 14, 1992

MEMORANDUM FOR: Frank J. Congel, Director
Division of Radiation Protection
and Emergency Preparedness

THRU: William D. Beckner, Chief
Risk Applications Branch
Division of Radiation Protection
and Emergency Preparedness

FROM: Robert L. Palla
Risk Applications Branch
Division of Radiation Protection
and Emergency Preparedness

SUBJECT: SUMMARY OF DECEMBER 18, 1991 MEETING
WITH INDUSTRY ON ACCIDENT MANAGEMENT

On December 18, 1991, the NRC staff met with representatives of the Nuclear Management and Resources Council (NUMARC), the Electric Power Research Institute (EPRI) and their contractor SAROS Inc., and New Hampshire Yankee (licensee for Seabrook). The purpose of this meeting was to discuss the results of a trial application of the NUMARC "Process for Evaluating Accident Management Capabilities." This memorandum summarizes the most significant results of the meeting. A list of meeting attendees and the meeting agenda are presented in Enclosures 1 and 2. A copy of the meeting handouts is provided as Enclosure 3.

Following introductory remarks. D. Modeen (NUMARC) outlined the objectives and the planning/preparation for the application. Major points are summarized below.

- The trial application was intended as a limited test of the useability and practicality of the NUMARC process, with an emphasis on identifying strengths and weaknesses of the method, and areas in which the method and documentation might need to be modified.

- The trial application was carried out voluntarily by NHY in support of the NUMARC effort and was discussed in advance with NRC staff. The actual application was carried out at the Seabrook site over a two-day period allocated for the review of three sequences from the Seabrook IPE. The majority of time was spent considering the first sequence and a number of variations on that sequence. Review of the remaining two sequences suggested the post-core damage evaluation was not dependent on initial sequence selection.

DF02

° The intent was to test all five steps of the process, although from the beginning it was recognized the third step (Organize and Integrate Candidate Enhancements) would be difficult and the last two steps (Test Options Against Specific Sequences, Select Enhancements and Plant Implementation) would clearly be artificial due to time constraints of the table-top. As a result, greater attention was placed on the first two steps, with somewhat less attention on the third. EPRI/SAROS noted that from the table-top discussions, it appears the utility's approach toward the latter three steps would be consistent with those outlined in the process.

Utility preparations and details of the application were described by K. Kiper (NHY), who lead the evaluation effort. Key aspects of the trial application are noted below based on the presentation and discussions.

° The evaluation team for the trial application consisted of 7 utility staff members, with expertise in the areas of operations, emergency preparedness, PRA, and plant engineering. In retrospect, the same types of personnel would be used on the evaluation team, however, additional personnel with expertise in training and maintenance would have been added.

° The NUMARC process document was followed generally, but not specifically. The question sets in the document were found to facilitate discussions, and provided the structure for the detailed evaluation.

° The trial application was, in essence, a brainstorming session which represents a first phase of thoroughly evaluating the selected sequence and potential enhancements. Specifically, certain questions relevant to the evaluation were identified during the discussions but could not be answered within the time allotted. In a more complete evaluation process, the brainstorming session might be followed by an information gathering phase (in which team members collect specific additional information), followed by additional meetings as a team or a subset of the team.

° The two-day effort by the evaluation team was estimated by industry to be only a small portion of the total effort that would be required to complete the accident management evaluation for the selected sequence. Due to the limited application of the assessment process during the tabletop, the industry representatives were not comfortable with any specific estimates. Instead of providing a man-hour estimate to the NRC staff, Kiper explained how the five-step evaluation process might unfold at New Hampshire Yankee. He believes that the interdisciplinary team would only meet periodically to brainstorm or review proposals, and that two people working approximately half-time might require approximately a calendar year to nurture the candidate changes, evaluations, and documentation through the review points necessary to support implementation.

- It was generally agreed there is no clear criteria by which to judge when the evaluation is complete, i.e., when to stop. NUMARC reiterated its objective to provide guidance as to the appropriate accident management considerations and specific technical recommendations to enhance such capabilities. However, in contrast to NRC's desire to specify criteria, NUMARC believes that ultimately the utility must decide what level of implementation is appropriate.

- Documentation of the evaluation team's discussions was said to be an aspect of the evaluation process which requires close attention by the evaluation team, otherwise important items might be missed. This was facilitated somewhat by the use of a standard form developed by the team leader. However, the extent to which this improved the documentation and scrutibility of the trial application is unclear since completed forms were not provided to the staff. EPRI/SAROS has recommended the report call for a dedicated scribe to capture the useful information.

- Based on the application, the team identified several potential enhancements which they consider candidates for further consideraction. The one example cited involved identifying means by which the plant computer might be made more available late in an event.

R. Oehlberg (EPRI) and G. Boyd (SAROS) completed the presentations with a discussion of the insights gained from the trial application, and the planned modifications to the evaluation process document. These are described in Enclosure 3.

The following items were identified during closing discussions:

- NUMARC plans to issue the evaluation process document as a NUMARC report in the first half of 1992.

- NUMARC committed to determine whether the documentation developed during the trial application can be brought to the NUMARC office for inspection by NRC staff.

- A date for the next NRC/NUMARC meeting on accident management was tentatively set for January 30, 1992, at which time representatives of the Owners Groups would present their detailed plans and schedules for development of vendor-specific accident management guidance. D. Solberg (RES) offered to have INEL present the results of RES-sponsored work related to information needs for severe accidents at that time.

° A copy of a recent report on the trial application of the INEL methodology for developing and assessing accident management plans (Volume 2 to NUREG/CR-5543) was provided to NUMARC and will be placed in the PDR.

Robert L. Palla
Risk Applications Branch
Division of Radiation Protection
and Emergency Preparedness

Enclosures: As stated

° A copy of a recent report on the trial application of the INEL methodology for developing and assessing accident management plans (Volume 2 to NUREG/CR-5543) was provided to NUMARC and will be placed in the PDR.

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Enclosures: As stated

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ENCLOSURE 1

NRC/NUMARC MTG. ON ACCIDENT MGMT
DEC 18, 1991

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NRC - NUMARC MEETING ON THE TRIAL APPLICATION OF
"A PROCESS FOR EVALUATING ACCIDENT MANAGEMENT CAPABILITIES"

PRELIMINARY AGENDA

Time	Topic
1:00 pm	Introductions
1:10 pm	Table-top Objectives
1:20 pm	Table-top Preparations
	- EPRI/NUMARC/SAROS
	- Utility Team
1:45 pm	Insights Gained
3:00 pm	Future Plants, General Discussion and Response to Questions
4:00 pm	Adjourn

ENCLOSURE 3

TABLE TOP APPLICATION OF THE DOCUMENT

A PROCESS FOR EVALUATING ACCIDENT MANAGEMENT CAPABILITIES

NRC - NUMARC MEETING

DECEMBER 18, 1991
ROCKVILLE, MD

PRESENTATION OVERVIEW

o	OBJECTIVES	D. MODEEN
o	NUMARC-EPRI-SAROS PREPARATIONS	D. MODEEN
o	AM EXERCISE - UTILITY PERSPECTIVE PREPARATIONS AND PERFORMANCE	K. KIPER
o	INSIGHTS GAINED	R. OEHLBERG/ G. BOYD

OBJECTIVES

- o TEST THE OVERALL USEABILITY AND PRACTICALITY OF PERFORMING AN EVALUATION USING THE "A PROCESS FOR EVALUATING ACCIDENT MANAGEMENT CAPABILITIES" DOCUMENT
  - IDENTIFY ANY AREAS WHERE THE REPORT IS EITHER UNCLEAR OR POORLY WRITTEN
  - RESPONSIBILITIES AND INTERACTIONS OF THE EVALUATION TEAM MEMBERS
  - ADEQUACY OF SCOPE, STRUCTURE & CONTENT OF EXAMPLE QUESTION BANK
  - WHAT CONSTITUTES ADEQUATE DOCUMENTATION
- o EXPLORE TO SOME DEPTH THE FINAL STEPS OF THE EVALUATION - INTEGRATION, TESTING AND FINAL DECISION-MAKING - RECOGNIZING IT WILL BE LIMITED
- o IDENTIFY INSIGHTS AS TO HOW IT MAY BE USED IN CONJUNCTION WITH THE OWNERS GROUP-SPECIFIC AMG

NUMARC - EPRI - SAROS PREPARATIONS

- o PLAN TO CAPTURE THE INSIGHTS RESULTING FROM THE TABLE-TOP
  - CONSIDER HOW TO BEST REFLECT THOSE INSIGHTS

- o OUTLINE OF TABLE-TOP CONSIDERATIONS (FOR UTILITY AND NRC STAFF)
  - OBJECTIVES
  - PROPOSED GROUNDRULES
  - LOGISTICAL SUPPORT OF NHY
  - SCOPE OF ACCIDENT SEQUENCES TO ASSESS
  - DOCUMENTATION
  - SCHEDULE

NUMARC - EPRI - SAROS PREPARATIONS

- o CHRONOLOGY OF EVENTS
  - JUL 12: VERBAL DISCUSSION WITH NRC STAFF
  - AUG 28: WRITTEN OUTLINE OF TABLE-TOP OBJECTIVES AND PROCESS SHARED WITH NRC STAFF
  - NOV 1: CONFERENCE CALL AMONG NUMARC, EPRI, SAROS AND NHY
  - NOV 13: CONFERENCE CALL AMONG SAME PARITES ABOVE PLUS NRC STAFF
  - NOV 21-22: PERFORM THE TABLE-TOP
  - DEC 18: DEBRIEFING

- o SCOPE OF EFFORT
  - TWO DAYS @ UTILITY SITE
  - ALL FIVE STEPS OF THE PROCESS
  - ALL ACCIDENT MANAGEMENT ELEMENTS

- o NUMARC/EPRI AVOIDED PRESCRIBING FOR THE UTILITY ANY CRITERIA, DOCUMENTATION FORMAT, ETC PRIOR TO THE CONDUCT OF THE TABLE-TOP

AM Exercise - Utility Perspective

December 18, 1991

Ken Kiper
Reliability and Safety Engineering
New Hampshire Yankee

Utility Preparation

- Studied SAROS document
- Chose team - Ops, EP, PRA, Eng., (Training,...)
- Summarized process
- Set up agenda for meeting
- Selected sequences - IPE Report
- Prepared documentation forms

AM Planning Meeting

- Lead/directed independent of "observers"
- Defined purpose - to identify existing AM capabilities and need for enhancements
- Discussed process, existing capabilities, IPE sequences
- Followed document process generally, questions specifically
- Free-form discussion, brain-storming

Utility Follow-up

- Summarized comments/potential AM enhancements - sent to group for corrections, additions
- Proposed priorities
  1. Before Generic Information is available
  2. Generic Information/guidance/analysis
  3. Plant-specific input to Generic Info
  4. Long term enhancements

Conclusions About Process

- Process - common sense, questions useful to cover all AM areas
- Process - helped identify significant AM capabilities already in place - e.g., lessons learned from EP drills
- Personnel - experienced in PRA, AM, EP, beyond-design-basis eng.
- Documentation - difficult in brain-storming

Conclusions About Process

- Table Top Exercise - compressed in time; limited w.r.t. preparation, team composition; raised questions that could not be answered without analysis - iterative process
- Timing - meeting would have been more appropriate after generic information available

INSIGHTS FROM THE TABLE-TOP APPLICATION OF THE EVALUATION PROCESS

Richard Oehlberg
Electric Power Research Institute

Gary Boyd
SAROS, Inc.

December 18, 1991

BACKGROUND

- Application carried out by utility independent of EPRI/SAROS/NUMARC
- Some preliminary work was completed independently by the utility prior to the actual meeting:
  - Sequence selection
  - Question review and summary
  - Selection of participants
- One and one-half days devoted to utility demonstration
- A few hours of debriefing at the end to maximize insights

INSIGHTS TO BE DISCUSSED BY TOPIC

- Sequence Selection
- Evaluation Questions
- Identification of Enhancements
- Steps 3 through 5 of the Evaluation Process
- Evaluation Team Makeup
- Logistics of the Evaluation

INSIGHTS: SEQUENCE SELECTION

Observation

- Focus was on sequences dominating IPE results.

Discussion

- Utility's extensive PRA experience yielded insights applicable to a broad range of sequences.
- Others might gain more benefit from considering some lower-frequency sequences to enhance defense-in-depth of process

Action

None. The report already includes a discussion about the need for coverage of a range of different accident types, but allows utility judgment concerning scope.

INSIGHTS: SEQUENCE SELECTION

Observation

- Post-core damage evaluation was not dependent on initial sequence selection. Some participants suggested that all insights would be derived from considering one sequence type.

Discussion

- It was expected that sequence specifics would not have a large impact on post core damage evaluation. In this case appropriate specifics on guidance were assumed to be forthcoming from the owners group work. An evaluation after availability of owners group guidance could test the coverage of plant-specific scenarios.

Action

Need to clarify that the sequence selection would be dependent on the objectives for the evaluation process.

INSIGHTS: SEQUENCE SELECTION

Observation

- The utility participants felt that adequate coverage would be supplied by doing the evaluation once through, and that there would be limited additional insights through coverage of other sequences. It was suggested that other sequences could be used for testing, as in step 4 of the process.

Discussion

- This result may not be generic. The evaluation tended to cover areas not specific to a sequence, but it is not clear that other, less-experienced groups would gain comprehensive coverage once through the process.
- A number of the insights were specific to station blackout. If the evaluation had started with a different sequence, the coverage would have been different.
- The dominant sequences in this plant are similar in terms of accident management characteristics.

INSIGHTS: SEQUENCE SELECTION

Observation

- Coverage by examining a single sequence (continued)

Discussion

- Part of this conclusion could be the result of timing of the demonstration. It was possible to assume coverage with guidance that will be provided by the owners groups. An evaluation after owners group guidance might test coverage of different sequence types.
- For utilities less advanced in deriving IPE insights, the coverage of different sequences could be important for discovery of pre-core damage enhancements.

INSIGHTS: SEQUENCE SELECTION

Observation

- Coverage by examining a single sequence (continued)

Discussion

- There is repetitiveness in some of the questions, particularly for some evaluation areas not much affected by the type of accident.
- Part of this conclusion could have resulted from the fact that the utility has previously considered many issues related to accident management

Action

Currently considering ways to improve the process, perhaps by identifying the areas that do not change much (e.g., decision processes, TSC support) and streamlining the process to eliminate repetitiveness. This requires more thought since the process is intended to serve utilities that are developing their own guidance, in addition to those using the owners groups' work, and may also be used by less experienced utilities.

INSIGHTS: SEQUENCE SELECTION

Observation

- The evaluation covered a station blackout scenario, and many insights were specific to that scenario.

Discussion

- Station blackout (and some external events) may uniquely stress the accident management provisions.

Action

Currently considering additional, more specific sequence selection guidance that station blackout be included in the evaluation.

INSIGHTS: SEQUENCE SELECTION

Observation

- Some participants noted that the report section in this area was still somewhat confusing.

Discussion

- Upon reexamination, it appears that the sequence selection report section is out of balance relative to the rest of the report. The additional detail creates confusion rather than clarification. The detail is not needed for utilities that have completed an IPE.

Action

Simplify the sequence selection part of the report (since everyone will have completed an IPE when it is used) and reevaluate the need for a tie to the TBR core damage and containment condition descriptors.

INSIGHTS: SEQUENCE SELECTION

Observation

- The utility consolidated the accident pathways into three phases: pre-, during, and post-core damage.

Discussion

- This breakdown appeared to be adequate, as long as phases are well-defined.

Action

May be possible to simplify the discussion of accident pathways. As noted previously, the tie to the TBR through definition of core damage and containment conditions is being reconsidered. This could simplify this part of the report.

INSIGHTS: EVALUATION QUESTIONS

Observation

- Some participants initially wondered about the usefulness of the questions, but concluded that they brought about the necessary discussion.
- A few questions were confusing.
- No new questions were added.

Discussion

- The questions appeared to be a successful means of evaluation and stimulated discussion.

Action

No major changes; clarification of a few questions.

INSIGHTS: EVALUATION QUESTIONS

Observation

- The discussion frequently wandered off the specific questions, with useful results.
- In a few cases, the group tended to limit discussion to the very specific question, perhaps overly restricting the discussion.

Discussion

- The questions were intended to stimulate discussion, and it was expected that the questions would bring about secondary discussions.
- The few cases where discussion might have been too restrictive would probably not be a problem in a real evaluation where time would not be the limiting factor as in the demonstration.

Action

Note in the report that the process should not be considered a step-by-step rigid procedure, and that evaluation of all areas related to accident management should be encouraged.

INSIGHTS: EVALUATION QUESTIONS

Observation

- After the first sequence, the utility chose to summarize the findings and then consider other sequences against those findings rather than the questions.

Discussion

- For the general types of findings that applied to all sequences, this method appeared to be appropriate.

  It is not clear that this would have been done without the time constraint of the table-top, or that it would be a good practice for less-experienced participants.

Action

None. Although the utility chose a slightly different tack, the current process allows for the flexibility observed.

INSIGHTS: ENHANCEMENT IDENTIFICATION

Observation

- The questions tended to elicit a list of areas that should be considered for possible improvement rather than specific enhancements.

Discussion

- It was expected that some responses would be general areas for investigation while other might be very specific proposals. In an actual evaluation, the team (or a subset thereof) would investigate each area resulting in a specific change or concluding that the current situation was acceptable.

Action

Discuss the table top experience in the report, noting that the process would best be carried out in stages rather than in one or two sessions, allowing time for investigation of specific topics.

INSIGHTS: ENHANCEMENT IDENTIFICATION

Observation

- In some cases it took persistence on the part of individuais to express a viewpoint that was not universally held.
- The team leader was generally successful in focusing the discussion and eliciting responses.

Discussion

- The dynamics of the evaluation team are important. A strong leader who can facilitate and draw out all applicable discussion is essential.

Action

Strengthen the report section on team makeup and leadership, and mention the table top insights. Consider workshop session devoted to leadership of the evaluation process.

INSIGHTS: ENHANCEMENT IDENTIFICATION

Observation

- The principal sequence had been the subject of a realistic plant drill; several of the evaluation responses were based on insights that were derived from drills.

Discussion

- For this particular utility, the drill insights were an important input for the evaluation process.

Action

Ensure inclusion on the evaluation team of several participants with drill experience.

Also, include a discussion of the benefit derived from drills and walkthroughs, and consider suggesting such drills as a useful precursor to the evaluation.

INSIGHTS: ENHANCEMENT IDENTIFICATION

Observation

- A frequent response was that the owners group input would handle the evaluation area.

Discussion

- The timing of the table top was not ideal for a utility that will use owners group input. Some areas were not fully examined because of assumptions about what the owners groups would provide.

Action

Clarify the description in the report of when the evaluation would best be done--after availability of the owners group input.

Revise the report after the owners groups are further along to ensure a smooth interface between their products and the evaluation.

INSIGHTS: STEPS 3 - 5

Observation

- The results of this limited evaluation tended toward areas requiring investigation, rather than specific options. Artificial time constraints of the table-top made it impossible to fully demonstrate an integration process (as in step 3).

Discussion

- It would appear that this group would have leaned toward an initially ad hoc method of integrating the options, rather than a more formal method. A more formal review of the identified potential changes may have been pursued after the initial evaluation. This flexibility is allowed in the process.

Action

No change needed.

INSIGHTS: STEPS 3 - 5

Observation

- None of the options involved specific proposals requiring testing against individual sequences (as in step 4).
- The participating utility suggested that the different sequences could be tested in this step, rather than evaluated separately using questions in step 2.

Discussion

- The demonstration was too limited in this area to suggest proposed changes.

Action

No change needed.

INSIGHTS: STEPS 3 - 5

Observation

- It was not possible to test step 5, enhancement section and implementation.
- Decision criteria were discussed, but there was no possibility of actually applying criteria in the table-top demonstration.

Discussion

- In discussion with the utility, it appears that any proposed changes would be handled in the same way as other plant changes. There is nothing special about accident management relative to other needs.
- There could be some simple quantitative calculations of avoided financial risk, but the decision would not be based on strict quantitative criteria.

Action

None needed. The report allows flexibility in the decision criteria and there were no insights that would suggest the need for any change.

INSIGHTS: TEAM MAKEUP

Observation

- Team members would benefit from a thorough discussion of accident management objectives, philosophy and groundrules at beginning of the evaluation process.

Discussion

- Setting the stage would help to avoid sidetrack discussions, such as role of cost-benefit, and would help to ensure focus on appropriate types of enhancements to accident management.

Action

Address pre-evaluation briefing of participants in report and at future workshop.

INSIGHTS: TEAM MAKEUP

Observation

- Several participants thought that less experienced utilities might have a problem putting together a team that would perform a truly effective and broad-scoped evaluation.

- Many insights derived from the evaluation were based on extensive PRA experience, realistic drills, and years of study of many safety issues. Although not all utilities would have this level of experience, all will have benefit of a recent IPE, participation in emergency planning exercises, and owners group-specific accident management guidance. It is judged that with proper leadership, the evaluation process could be completed successfully at any utility.

Action

At future industry workshop(s), focus on the need to form a team that can be effective in the evaluation.

INSIGHTS: TEAM MAKEUP

Observation

- The team for the demonstration was quite strong, and represented individuals with knowledge of the IPE, the emergency drills, the TSC, emergency procedures, plant systems, emergency planning, and past studies related to accident management.
- It appeared that the team could have used more representation from operations and maintenance.

Discussion

- The team makeup represented most of the recommended disciplines.
- The utility indicated that more involvement of operations and maintenance would probably be included in an actual evaluation, but that a table top demonstration would necessarily be limited due to resource limitations.

Action

No change needed.

INSIGHTS: LOGISTICS

Observation

- At times, discussion involved extensive interaction and, because of it, some good insights and potential enhancements might not have been captured for future consideration.

Discussion

- Some of the discussions involved several topics at once, and it was not always possible to catch all of the topics being discussed.
- A dedicated scribe could have helped ensure all useful information was captured.

Action

Stress the importance of tracking the evaluation.

Include discussion in the industry workshop(s) on the evaluation process.

SUMMARY

- Table-top demonstration showed basic evaluation process to be sound
  - questions and questioning process good
  - multidisciplinary team effective
  - useful insights generated even in two-day demonstration
  - flexibility in process met utility-specific objectives

SUMMARY

- Some improvements were suggested
  - simplification and clarification of the report
  - need for strong team leadership
  - reconsideration of number of sequences to be studied

SUMMARY

- The demonstration was not complete with respect to all process steps
  - not possible to simulate 2-3 month process in two days
  - timing not optimal since owners group guidance was not available
  - the demonstration identified mostly areas for further study rather than specific options
  - through discussions with the utility it seemed that their anticipated next steps would be consistent with the process, although less formal than the steps in the process would imply

WHAT'S NEXT

- Report findings and recommendations to JOG AMAC and SAWG for review
- Improvement of report as suggested in individual responses
- Development of clearer interface with owners group output when owners groups are further along

Worksheet 1: Evaluation of Candidate Accident Man..gement Enhancements

Sequence:				
Accident Management Capabilities [from SAROS document, Rev. 1, May 1991]	**Response - Accident Phase**			**Candidate Options**
	Pre-Core Melt	Core Me	Post Core Melt	
1.0 Personnel Resources				
1.1 Training [p.33]				
training for all groups appropriate				
modifications to current training				
drill/walkthrough adequately simul: accident conditions				
feed-back of drill experience				
drills adequately test recovery actio:s				
aware of limitations of drills				
consistent with realistic understanding, factor in new knowledge				
trained re: limitations of instrumentation				
proper balance with other training				
1.2 Decision-Making / Organization [p.34]				
responsibilities for decision-making and backup decision-making optimal				

Worksheet 1: Evaluation of Candidate Accident Management Enhancements

Sequence:

Accident Management Capabilities [from SAROS document, Rev. 1, May 1991]	Response - Accident Phase			Candidate Options
	Pre-Core Melt	Core Melt	Post Core Melt	
roles for operators, tech-support, management adequate/consistent				
provisions for bypassing / expediting admin controls				
availability of personnel				
emerg. response team organization optimal				
ensure personnel safety				
protective action guidance improvements				
1.3 Communication [p.34]				
Comm. between CR and equip. operators adequate for repairs/recoveries				
Comm. between CR operators and TSC, EOF				
Comm. with general office, offsite support locations				
communication paths for various levels of decision making adequate				

Worksheet 1: Evaluation of Candidate Accident Management Enhancements

Sequence:

Accident Management Capabilities (from SAROS document, Rev. 1, May 1991)	Response - Accident Phase			Candidate Options
	Pre-Core Melt	Core Melt	Post Core Melt	
2.0 Systems and Equipment				
2.1 Repair/Restoration [p.38]				
process for determining priorities for repair				
access to equipment				
spare parts or replacements				
repair provisions to address effects of accident				
habitability				
2.2 Alternatives [p.38]				
other existing systems available				
overcoming support system failures				
advance preparations needed				
offsite resources identified, prepared				

Worksheet 1: Evaluation of Candidate Accident Management Enhancements

Sequence:

Accident Management Capabilities [from SAROS document, Rev. 1, May 1991]	Response - Accident Phase			Candidate Options
	Pre-Core Melt	Core Melt	Post Core Melt	
2.3 Instrumentation [p.39]				
adequate to support each phase of accident				
ranges and limitations understood				
physical effects due to accident conditions				
other plant instrumentation could be used to support decisions				
3.0 Information Resources				
3.1 Procedures and Guidance [p.41]				
adequate written procedures and guidance				
clear transition from EOPs to AM guidance				
current state of understanding re: severe accident behavior				
guidance needed to facilitate use of alternative systems or equipment				
guidance clear for reliable timely action				
information supporting AM in support facilities up-to-date				
guidance adequate to support decision -making				

Worksheet 1: Evaluation of Candidate Accident Management Enhancements

Sequence:

Accident Management Capabilities [from SAROS document, Rev. 1, May 1991]	Response - Accident Phase			Candidate Options
	Pre-Core Melt	Core Melt	Post Core Melt	
3.2 Process Information [p.42]				
control and verification indications available				
indications incorporated into procedures/guidance				
adequate info to judge positive and negative impacts of actions				
interpretation of indications when conditions are outside normal range				
3.3 Computational Aids and Technical Information [p.42]				
capabilities to perform limited calculations				
technical info re: positive and negative impact of mitigation action				
technical resources available - e.g. drawings, design descriptions,...				
technical resources kept current				
access to key safety analyses				