Program Instruction
PI 2
Risk Significance Determination

Revision 2

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RISK SIGNIFICANCE DETERMINATION

1 PURPOSE

This instruction provides guidelines for determining which SSCs are considered risk significant. This instruction implements the technical requirements discussed in Section 4.1.2.

2 SCOPE

This program instruction provides the specific NU and unit guidance to implement the technical guidance provided in NUMARC 93-01, Section 9.3.1, Establishing Risk Significant Criteria.

3 GENERAL METHODOLOGY

Once the selection of those systems and sub-systems determined to be within the scope of the Maintenance Rule has been completed, it is then necessary to determine which of these are "Risk Significant". The methodology for accomplishing this is shown in Figure 1, "Risk Significance Determination Process".

Risk significant systems and/or sub-systems can be either safety-related or non-safety-related. There are risk significant systems that are in a standby mode which must perform a safety function. When called upon they are required to be available and reliable (e.g., high pressure coolant injection). Entry into a Technical Specification Limiting Condition for Operation, although important, is not necessarily risk significant.

The unit specific Probabilistic Risk Assessment (PRA) shall be used to identify risk significant systems and/or sub-systems with respect to core damage. The unit specific PRA only addresses the risk relative to operation in power modes. It is equally important to identify as risk significant those systems and/or sub-systems that prevent containment failures (or bypasses) which would result in an unacceptable release, and those systems and or sub-systems which present a significant risk in non-power modes. Additionally, the PRA fails to address the risk associated with containment failures (or bypasses) which would result in an unacceptable off-site releases. For these reasons "Risk Significance" shall be determined using a combination of the following methods:

- Unit specific Probabilistic Risk Assessment (PRA),
- "Expert Panel" review and approval

The unit specific PRA shall be used to identify those systems which: contribute to

more then 90 % of the overall Core Melt or Damage Frequency (CMF or CDF) or; which would result in an unacceptable increase in the CMF if their availability was degraded or; which would result in significant decreases in the CMF if their availability were improved. This approach shall include consideration of the following specific calculations if available: Fussell-Vesely Importance Function (FV) as a measure of CMF; Risk Achievement Worth (RAW) and; Risk Reduction Worth (RRW). It should be noted that each of these methods will identify a different set of systems/sub-systems based upon differing concepts of importance. Each method is useful in providing insights into risk significant systems/sub-systems selection, and shall be given consideration in the decision making process. The list of front-line systems identified by this methodology would be supplemented with any support systems which are assumed within the PRA model but which are not themselves specifically modelled and correlated to the plant systems. The aggregate plant system listing so produced would then be augmented from those plant systems identified by the Expert Panel as potentially risk significant.

The use of an "Expert Panel" will compensate for any limitations within the PRA approach resulting from the PRA structure (e.g., model assumptions, treatment of support systems, level of definition of cut sets, cut set truncation, shadowing effect of very large (high frequency) cut sets, and inclusion of repair or restoration of failed equipment) and limitations in the meanings of the importance measures.

The "Expert Panel" shall consist of not less than five (5) individuals experienced with the specific unit's operation, maintenance, and/or PRA model. The panel shall be structured consistent with the guidelines contained in reference 7.2 and 7.3. The panel shall utilize their expertise to rank the unit's systems as to their overall contribution to mitigation of plant accidents or the system's potential to initiate those accidents. This ranking will be accomplished using a Delphi process. The use of a Delphi process will result in a ranking of systems consistent with that achieved through a PRA model but which accounts for some of the short comings inherent in the PRA model.[1] The panel's judgments shall include consideration of those systems which are required to prevent containment failures (or bypasses) which would result in an unacceptable off-site releases. The system listing so produced would then be used to augment those systems identified by the PRA as potentially risk significant.

The systems identified by the unit's Shutdown Risk Management program shall be reviewed by the Expert Panel and incorporated within the final listing of Risk Significant Systems as appropriate. This will provide assurance that those systems which are important to safety under shutdown and refueling conditions are identified in the context of the Maintenance Rule as "Risk Significant".

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[1] Refer to memo MES-94-038 on "Risk Significance Determination: PRA vs. Expert Panel results" from R. Flanagan to K. Hastings dated February 9, 1994 for supporting information.

4 RESPONSIBILITIES

4.1 Unit Directors

4.1.1 Assign knowledgeable individuals to serve as members on the Expert Panel

4.2 Supervisor - Probablistic Risk Assessment (PRA)

4.2.1 Assign individuals to serve on the Expert Panel for each Unit.

4.3 Supervisor - Safety Integration and Analysis

4.3.1 Assign individuals to serve on the Expert Panel for each Unit.

4.3.2 Provide information as needed to conduct a Preliminary Risk Assessment.

4.4 Unit Maintenance Rule Coordinator

4.4.1 Coordinate performance of all steps in Section 5.

4.4.2 Facilitate PRA/RS training activities if needed.

4.4.3 Document results and decision processes.

4.5 Probabilistic Risk Assessment (PRA) Section Representative

4.5.1 Participate in training material development.

4.5.2 Provide Unit MR Coordinator with PRA outputs as needed.

4.5.3 Participate in Expert Panel discussions and decisions.

4.6 Expert Panel Members

4.6.1 Participate in Expert Panel discussions and decisions.

4.6.2 Provide input to the Delphi Process for Risk Determination

4.6.3 Evaluate the PRA outputs for reasonableness.

5 INSTRUCTIONS

5.1 Probalistic Risk Determination of "Risk Significance"

Make a preliminary assessment of "Risk Significance" for the systems and sub-systems considered as in-scope to the Maintenance Rule based on the Core Melt Frequency cut sets[2], the Risk Achievement Worth, and the Risk Reduction Worth contained within the specific Unit's Probalistic Risk Analysis.

5.1.1 Obtain the cut sets for Core Melt Frequency from the Probalistic Risk Assessment (PRA) Section Representative.

5.1.2 Identify those front-line systems which should be considered risk significant by performing the following sequential steps utilizing the cut sets for Core Melt Frequency:

5.1.2.1 Rank the cut sets for Core Melt Frequency in decreasing order.

5.1.2.2 Identify the cut sets that cumulatively account for 90% of the overall Core Melt Frequency.

5.1.2.3 Eliminate cut sets that are not related to maintenance (e.g., operator error and external initiating events).

5.1.2.4 Considered risk significant those front-line systems included in the remaining cut set and provide a listing of them to the expert panel as an input in risk determination.

5.1.3 Obtain the Risk Achievement Worth (RAW) from the Probalistic Risk Assessment (PRA) Section Representative.

5.1.3.1 Calculate the Risk Achievement Worth for the individual front-line systems.

5.1.3.2 Rank the front-line systems in decreasing order of the Risk Achievement Worth.

5.1.3.3 Eliminate Risk Achievement Worth which are not specifically related to maintenance (e.g., operator error and external initiating events).

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[2] Fussel-Vesely importance measures may be utilized in lieu of CMF or CDF.

5.1.3.4 Consider as risk significant those front-line systems whose Risk Achievement Worth shows at least a doubling of the overall Core Damage Frequency (Risk Achievement Worth >2.00). A listing of these systems and their Risk Achievement Worth shall be provided as an input in risk determination.

> **NOTE:**
>
> The RAW value of 2.00 in NUMARC 93-01 assumes that the analysis is performed at the component or train level. If the analysis is performed at the system level, a value of 10.0 should be used. (ref. memo MES-94-312).

5.1.4 Obtain the Risk Reduction Worth (RRW) from the Probalistic Risk Assessment (PRA) Section Representative.

5.1.4.1 Calculate the Risk Reduction Worth for the individual front-line systems.

5.1.4.2 Rank the front-line systems in decreasing order of the Risk Reduction Worth.

5.1.4.3 Eliminate Risk Reduction Worth that are not specifically related to maintenance (e.g., operator error and external or initiating events).

5.1.5 Identify the front-line systems which are risk significant and produce a listing of these systems by performing the following sequential steps utilizing the Risk Reduction Worth:

5.1.5.1 Considered as risk significant those front-line systems whose Risk Reduction Worth exceeds 0.5 percent of the overall Core Damage Frequency (Risk Reduction Worth >1.005).

NOTE:

The RRW value of 1.005 in NUMARC 93-01 assumes that the analysis is performed at the component or train level. If the analysis is performed at the system level, a value of 1.05 should be used. (ref. memo MES-94-312).

5.1.6 Compile the three listings of front-line systems identified from F-V, RRW, or RAW into a single aggregate listing of PRA Risk Significant front-line systems using Form 5, "PRA - RISK SIGNIFICANT SYSTEMS". Indicate which risk measure caused the front-line system to be selected.

5.2 Correlation of PRA Systems to Plant Systems

The front-line systems identified in paragraph 5.1.6 are typically comprised of multiple plant systems. Additionally, the PRA assumes certain support equipment and systems are available whenever these front-line systems are required to operate. With the assistance of the Probabilistic Risk Assessment (PRA) Section Representative, catalog the in-scope systems which have been identified by F-V, RRW, or RAW as Risk Significant by completing the "PLANT SYSTEM" and "SUPPORT SYSTEM" portions of Form 5, "PRA - RISK SIGNIFICANT SYSTEMS".

5.2.1 Correlate the front-line systems defined within the unit specific Probalistic Risk Analysis to the systems/subsystems listed as in-scope to the Maintenance Rule Program on Form 5, "PRA - RISK SIGNIFICANT SYSTEMS". Front-line systems may be comprised of multiple plant systems.

5.2.2 Correlate the support systems assumed (i.e. not explicitly modelled) by the unit PRA to the systems/subsystems listed as in-scope to the Maintenance Rule Program for each front-line system on Form 5, "PRA - RISK SIGNIFICANT SYSTEMS".

5.2.3 Document the plant systems that are risk significant by entering "YES" in the "PRA" column on Form 6 next to the plant system

5.2.3.1 Enter "YES*" for those support systems which are assumed by the unit PRA in the "PRA" column on Form 6 next to the plant system

5.3 Expert Panel Determination of "Risk Significance"

NOTE:

Based on lessons learned at CY, MP2, & MP3 through the use of the risk significance decision process that follows, a modified polling process was developed for Milstone Unit 1as described in memo MES-94-367.

5.3.1 The Expert Panel shall make a Risk Significant Determinations based on the operational mode of the unit. The mode considerations shall be limited to Power operation. All systems/sub-systems shall be evaluated as to their risk significance in the mode.[3]

5.3.2 Each member of the Expert Panel shall rank each Critical Safety Function, utilizing Form 1, as to its relative importance with respect to accident mitigation.

5.3.2.1 Tabulate the results. The tabulation shall include the "arithmetic average value" for each Critical Safety Function (AVG CSF WT) as well as the value assigned by each Expert.

5.3.3 Each member of the Expert Panel shall rank each Event Initiator, utilizing Form 2, as to its Severity (consequence) and its Frequency (likelihood of occurrence).

5.3.3.1 The Unit Maintenance Rule Program Coordinator and the Probalistic Risk Assessment (PRA) Section Representative shall prepare Form 2 utilizing the "collapsed" PRA Initiator listing containing those events provided by the PRA Section representative.

5.3.3.2 Calculate an "Event Factor" from the data obtained from each expert. This factor will be calculated for each Event Initiator.

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3 Results obtained for modes 1 & 2 bound those obtained in modes 3 and/or 4 . Refer to memo MES-94-038 dated 02/19/94 from R. Flanagan to K. Hastings & memo MES-94-103 dated 03/23/94 from R. Flanagan to K. Hastings for justification.

$$\text{Event Factor} = 2 \times \frac{[(\text{Severity}) \times (\text{Frequency})]}{[(\text{Severity}) + (\text{Frequency})]}$$

5.3.3.3 Tabulate the results. The tabulation shall include the "arithmetic average value" for Severity, Frequency, and Event Factor (AVG EVENT WT) for each Event Initiator.

5.3.4 Each member of the Expert Panel shall rank each system/sub-systems, utilizing Form 3 as to its relative importance in fulfilling EACH Critical Safety Function (CSF) under accident conditions.

5.3.4.1 The Unit Maintenance Rule Program Coordinator and the Probalistic Risk Assessment (PRA) Section Representative shall prepare Form 3 utilizing the listing of plant systems and sub-systems which are considered in-scope to the Maintenance Rule.

5.3.5 Each member of the Expert Panel shall rank each system/sub-systems, utilizing Form 4 as to its relative potential to intiate EACH listed event.

5.3.5.1 The Unit Maintenance Rule Program Coordinator and the Probalistic Risk Assessment (PRA) Section Representative shall prepare Form 4 utilizing the listing of plant systems and sub-systems which are considered in-scope to the Maintenance Rule and the events which the PRA representative has indicated are applicable.

5.3.6 The Unit Maintenance Rule Program Coordinator shall have a "System CSF Factor"(SF) and "System-CSF Weighting Factor" (SWF) calculated from the data obtained from each expert. These factors will be calculated for each system/sub-system as follows:

$$\text{System CSF Factor} = .2 \times \frac{[(\text{AVG CSF WT}) \times (\text{System CSF Value})]}{[(\text{AVG CSF WT}) + (\text{System CSF Value})]}$$

$$\text{System-CSF Weighting Factor} = \frac{\Sigma \text{ System CSF Factor}}{6}$$

5.3.6.1 Tabulate the results. The tabulation shall include the average value assigned by the members of the Expert Panel for each System-CSF Weighting Factor, normalized to an average value of 3.0

5.3.7 Calculate a "System Event Factor"(SEF) and "System-Event Weighting Factor" (SEWF) from the data obtained from each expert. These factors will be calculated for each system/sub-system as follows:

$$\text{System Event Factor} = 2 \times \frac{[(\text{AVG Event WT}) \times (\text{System Event Value})]}{[(\text{AVG Event WT}) + (\text{System Event Value})]}$$

$$\text{System-Event Weighting Factor} = \frac{\Sigma \text{ System Event Factors}}{\text{Number of Events}}$$

5.3.7.1 Tabulate the results. The tabulation shall include the average value assigned by the members of the Expert Panel for each System-Event Weighting Factor, normalized to an average value of 3.0

5.3.8 Calculate the System Risk Factor from the System-Event Weighting Factor and the System-CSF Weighting Factor.

$$\text{System Risk Factor} = 2 \times \frac{[(\text{System Event WT}) \times (\text{System CSF WT})]}{[(\text{System Event WT}) + (\text{System CSF WT})]}$$

5.3.9 Compile the system/sub-system listings so obtained into a single preliminary "Expert Panel - Risk Significant" listing in which the systems are listed in descending order of Risk Factor on Form 5A, "EXPERT PANEL - RISK SIGNIFICANT SYSTEMS". For systems which have a Risk Factor of less then 2.25 indicate that they are not "Risk Significant" by placing "NO" in the "RISK" column.

NOTE:

The original Delphi cut-off value of 2.15 (ref. memo MES 94-038) was revised to 2.25 based on considerations for performing the PRA importance rankings at the system level rather than at the component/train level (ref. memo MES-94-312).

5.3.10 Provide the results (Form 5A, "EXPERT PANEL - RISK SIGNIFICANT SYSTEMS") to the Expert Panel for review. Following review the Expert Panel shall be polled again (if necessary).

5.3.10.1 The panel may accept the initial polling as representative of the panel's consensus. Such consensus shall be documented in the minutes of the panel.

5.3.10.2 Repolling may be accomplished verbally. Changes from the initial results resulting from this repolling shall be documented in the minutes of the panel meeting and shall be shown on the resulting Risk Factor Listing.

5.3.10.3 An expert panel member's ranking of a given system/sub-system shall not be changed, during re-polling, in such a manner as to exacerbate the difference between the original ranking and the group average.

5.3.11 This process shall be iterated until a consensus is reached.

5.4 Preliminary Risk Significant Systems Listing

5.4.1 Provide the Expert Panel with the unit specific copies of the following documents:

- The "PRA - Risk Significant Systems" listings (Form 5)
- The "Expert Panel - Risk Significant Systems" listing (Form 5A)
- The "Risk Significant Systems" (Form 6) with all systems listed on forms 5 & 5A entered. The source of the initial classification shall be documented by entering "YES" in the appropriate column.

5.4.2 The Expert Panel shall reconcile the "Risk Significant Systems" listing

produced from PRA and Expert Panel determinations.

5.4.2.1 All systems listed on Form 5, "PRA - RISK SIGNIFICANT SYSTEMS" as "Risk Significant" shall be initially be classified as "Risk Significant - Yes" on Form 6, "RISK SIGNIFICANT SYSTEMS AND SUB-SYSTEM" .

5.4.2.2 System identified on Form 5A, "EXPERT PANEL - RISK SIGNIFICANT SYSTEMS" as "Risk Significant" (Risk Factor > 2.25) but not listed on Form 5, "PRA - RISK SIGNIFICANT SYSTEMS" shall be reviewed to determine if they should be classified as "Risk Significant - Yes or No" on Form 6, "RISK SIGNIFICANT SYSTEMS". The technical basis for classifying as "Risk Significant - No" shall be documented by memo and the memo number entered on Form 6, "RISK SIGNIFICANT SYSTEMS" in the column headed "E/P Min.".

5.4.2.3 Any system deemed "Risk Significant" on Form 5A, "EXPERT PANEL - RISK SIGNIFICANT SYSTEMS" (Risk Factor > 2.25) and which in the opinion of the Expert Panel prevents containment failures (or bypasses) which would result in an unacceptable release shall classified as "Risk Significant - Yes" on Form 6, "RISK SIGNIFICANT SYSTEMS".

5.5 Shutdown Risk Significant Systems Listing

5.5.1 Make a preliminary assessment of "Risk Significance" in shutdown modes (Cold shutdown and refueling) for the systems and sub-systems considered as in-scope to the Maintenance Rule based on Shutdown Risk Management.[4]

5.5.2 Obtain the list of structures, systems, and sub-systems which are required to address "Shutdown Risk System Requirements" from the Probalistic Risk Assessment (PRA) Section Representative.

5.5.3 Correlate the systems identified through the "Shutdown Risk System Requirements" to the systems/subsystems listed as in-scope to the

[4] NUMARC 91-06 "Guidelines for Industry Action to Address Shutdown Management" as implemented by ACP 3.38 (Shutdown Risk Management Program) at Millstone Nuclear Station and by ACP 1.0-78 (Shutdown Risk Management Program) at Connecticut Yankee Nuclear Station

Maintenance Rule Program on Form 5B, "SHUTDOWN RISK MANAGEMENT EVALUATION".

5.6 Final Risk Significant Systems Listing

5.6.1 Verify that all plant systems and support systems listed on Form 5B, "SHUTDOWN RISK MANAGEMENT EVALUATION" are included in the list of systems on Form 6, "RISK SIGNIFICANT SYSTEMS AND SUB-SYSTEM"

5.6.2 The Expert Panel shall reconcile the "RISK SIGNIFICANT SYSTEMS" (Form 6) listing and the tabulated listings of systems/sub-systems resulting from "SHUTDOWN RISK SYSTEM EVALUATION" (Form 5B).

5.6.3 Add or delete systems and/or sub-systems to the "RISK SIGNIFICANT SYSTEMS" listing of Form 6.

5.6.3.1 Any plant systems, which in the consensus opinion of the Expert Panel are risk significant, may be added to "RISK SIGNIFICANT SYSTEMS" (Form 6). The technical basis for additions shall be documented by memo and the memo number entered on Form 6 in the column headed "E/P Min.".

5.6.3.2 Any plant systems, which in the consensus opinion of the Expert Panel, are not risk significant may be deleted from Form 6. The technical basis for deletion shall be documented by memo and the memo number entered on Form 6 in the column headed "E/P Min.".

- Under no circumstance may the classification of a front-line PRA system listed on Form 5 be changed to "Risk Significant - No" on Form 6.

- A change in classification for other PRA identified systems requires that the PRA Section provide a technical justification and concur in the change in classification to "Risk Significant - No" on Form 6.

5.6.3.3 The Expert Panel shall formally review and accept the "RISK SIGNIFICANT SYSTEMS" list (Form 6) and all related justifications as representing those systems which are "Risk Significant" with respect to the Maintenance Rule requirements for the unit under consideration.

5.7 Evaluating Risk Significance of New Systems Added to Maintenance Rule Scope Subsequent to the Initial Risk Significance Decision Process

The basic intent of the risk significant decision process is to identify the most important systems which: 1) mitigate the consequence of accidents and reduce probability of core damage, and 2) prevent containment failure or bypass that could result in an unacceptable release (10 CFR Part 100 type releases) to the environment. The original decision process consisted of

- PRA risk importance measure data related to core damage frequency
- Expert Panel delphi voting process (except Unit 1)
- Evaluation of shutdown risk requirements
- Expert Panel judgement

The delphi process will not be repeated. The decision process will consist of Expert Panel (EP) discussion for each system considering the questions which follow. As was required during the initial risk significance decision process, the PRA representative must be present during all EP risk significant decisions. Based on the discussion of each of these questions the EP shall make a determination of whether the system should be made risk significant and the results documented in the Expert Panel meeting minutes and the risk significant tables in the Unit Basis Document..

- Is the system modeled in PRA for Accident Mitigation functions?
- Is the system in-scope for the Accident Mitigation scoping criterion?
- Is the system used for reactivity control?
- Is the system used for inventory and pressure control?
- Is the system required for heat removal?
- Is the system used to maintain containment integrity or prevent off-site releases? Rx. Vessel, Fuel, and Containment are risk significant by NRC expectations as these are the primary fission product barriers.

- Is the system required to ensure operation of other risk significant systems?
- Is the system a significant contributor to plant specific scram history?
- Is the system required for shutdown risk considerations?

6.0 DOCUMENTATION

The Risk Significant Determination process is documented in accordance with instructions contained in Section 5.0 of this Program Instruction. The results of the Probabilistic Risk Analysis evaluation are documented on Form 5. The results obtained from the Expert Panel risk determination process are documented using Forms 1 through 4 and 5A. The results of the Expert Panel's deliberations are documented in the meeting minutes of the panel. The final reconciled "Risk Significant Systems and Sub-systems" listing is documented using Form 6. Additions, deletions, or changes in initial classification on Form 6 shall be documented by memo.

The reconciled "Risk Significant Systems and Sub-systems" will be used in Phase II Scoping and in Performance Criteria.

This PI addresses the documentation requirements specified in NUMARC 93-01 Section 13.2.

7.0 REFERENCES

7.1 NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, "

7.2 NUREG/CR-5424, "Eliciting and Analyzing Expert Judgement"

7.3 NUREG/CR-4692, PLG-0533, "Methods for the Elicitation and Use of Expert Opinion in Risk Assessment."

7.4 GL 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities."

7.5 NUREG/CR-5695, "A Process for Risk-Focused Maintenance."

7.6 NUREG/CR-4550, "Analysis of Core Damage Frequency"

7.7 NUREG/CR-3385, "Measures of Risk Importance"

7.8 NUREG/CR-5692, "Generic Risk Insights for General Electric Boiling Water Reactors"

7.9 NUREG/CR-5637, "Generic Risk Insights for Westinghouse and Combustion Engineering Pressurized Water Reactors".

7.10 Memo MES-94-038, dated 2/9/94, from R. Flanagan to K. Hastings, subject "Risk Significance Determination: PRA vs. Expert Panel Results."

7.11 Memo MES-94-103, dated 2/19/94, from R. Flanagan to K. Hastings, subject "Risk Determination Comparison of Expert Panel Results for Power/Nonpower Modes."

7.12 Memo MES-94-312, dated 8/18/94, from R. Flanagan to K. Hastings, subject "System Level vs. Train Level PRA Risk Determination."

7.13 Memo MES-94-367, dated 10/11/94, from K. Hastings to file, "Millstone Unit 1 Expert Panel - Risk Significance Determination."

FORM 1
CRITICAL SAFETY FUNCTIONS

Plant: MP1 MP2 MP3 CY
(circle one)

CRITICAL SAFETY FUNCTION	1.0	2.0	3.0
Reactivity Control: Those system/sub-system required to ensure sufficient negative reactivity is present to shutdown the reactor & maintain it shutdown.			
Auxiliaries: Those systems/sub-systems required to ensure operation of critical components (e.g. component cooling, ventilation cooling, electrical distribution & generation, et.al.).			
Heat Removal: Those systems/sub-systems required to ensure that heat is removed from the fuel and primary system temperature can be maintained and/or decreased.			
Inventory & Pressure Control: Those systems/sub-systems required to ensure water can be added to the primary system to cover or recover the fuel, & prevent void formations or over pressure conditions from occurring within the RCS			
Containment Integrity: Those system/sub-system required to ensure that Containment is maintained within design specifications and un-breached.			
Radiation Releases: Those system/sub-system required to ensure off-site releases are within the limits of 10 CFR 100.			

Directions:
1) Weight each CSF by placing an "X" in the appropriate box, with 1.0 being the least or lowest weighting in importance to reducing plant risk and 3.0 being the highest or most important to reducing plant risk.
2) For each listed CSF, assign a weighting as to the relative importance of the function to reducing plant risk.
3) Evaluation should assume accident conditions exist.

Signature:_____ Date: _____

FORM 2
INITIATING EVENTS

Plant: MP1 MP2 MP3 CY
(circle one)

INITIATING EVENTS	FREQUENCY	SEVERITY

Directions:

1) Under **INITIATING EVENTS** list all PRA initiators for the Unit under consideration. Utilize additional pages as necessary.
2) For each listed Initiating Event assign a weighting as to the relative Frequency and Severity (potential for core damage to occur or to prevent containment failures or bypasses which would result in an unacceptable off-site releases)
4) Weight the **FREQUENCY** and **SEVERITY** for each initiating event by placing a value between 1.0 and 3.0.
5) **FREQUENCY**: 1.0 being the least frequent or likely to occur and 3.0 being the most frequent or having the highest likelihood of occurring.
6) **SEVERITY**: 1.0 being the least or lowest potential for core damage to occur or for 10 CFR 100 limits to be challenged and 3.0 being the highest or greatest likelihood of core damage to occurring or 10 CFR 100 limits being challenged.

Signature:_____ Date: _____

Page 1 of _____

FORM 2A
INITIATING EVENTS
(continued)

Plant: MP1 MP2 MP3 CY
(circle one)

INITIATING EVENTS	FREQUENCY	SEVERITY

Signature: _____ Date: _____

Page 2 of _____

FORM 3
SYSTEMS-CSF

Plant: MP1 MP2 MP3 CY
(circle one)

SYSTEMS / SUB-SYSTEMS	REACTIVITY CONTROL	AUXILIARIES	HEAT REMOVAL	INVENTORY CONTROL	CTMT INTEGRITY	RADIATION RELEASES

Directions:
1) For each system/sub-system listed, assign a weighting to each Critical Safety Functions as to the system's (sub-system's) relative importance in full filling this function under accident conditions. Weight the importance for each system to the CSF by assigning a value between 1.0 and 3.0.
2) Importance: 1.0 having the least impact on maintaining, preserving or restoring the CSF and 3.0 having the most impact on maintaining, preserving or restoring theCSF.
3) Evaluation should assume accident conditions exist.

Page 1 of _____

FORM 3A
SYSTEMS-CSF

Plant: MP1 MP2 MP3 CY
(circle one)

SYSTEMS / SUB-SYSTEMS	REACTIVITY CONTROL	AUXILIARIES	HEAT REMOVAL	INVENTORY CONTROL	CTMT INTEGRITY	RADIATION RELEASES

Signature: _____ Date: _____

Page ____ of _____

FORM 4
SYSTEMS-EVENTS

Plant: MP1 MP2 MP3 CY
(circle one)

EVENTS ⇒ / SYSTEM/SUB-SYSTEM ⇓																									

Directions: 1) For each system/sub-system listed, assign a weighting as to the system's (sub-system's) relative importance in initiating this event. Weight the importance for each system to event initiation by assigning a value between 1.0 and 3.0.

2) **Importance**: 1.0 having the least impact on intiating an event and 3.0 having the most impact on intiating an event.

Page ____ of _____

FORM 5
PRA
RISK SIGNIFICANT SYSTEMS

Plant: MP1 MP2 MP3 CY
(circle one)

FRONT-LINE SYSTEM	CDF (Y/N)	RAW (Y/N)	RRW (Y/N)	RISK (Y/N)	PLANT SYSTEMS	SUPPORT SYSTEMS

FORM 5A
EXPERT PANEL
RISK SIGNIFICANT SYSTEMS

at: MP1 MP2 MP3 CY
(circle one)

SYSTEM	SUBSYSTEM	RISK FACTOR	RANKING	RISK (Y/N)

FORM 5B
SHUTDOWN RISK MANAGEMENT EVALUATION

Plant: MP1 MP2 MP3 CY
(circle one)

SAFETY FUNCTION	EQUIPMENT REQUIREMENTS	PLANT SYSTEMS	SUPPORT SYSTEMS

FORM 6
RISK SIGNIFICANT SYSTEMS AND SUB-SYSTEM

Plant: MP1 MP2 MP3 CY
(circle one)

SYSTEM	SUBSYSTEM	PRA Risk (Y/Y*/N)	E/P Risk (Y/N)	E/P Mins. (memo#)	RISK SIGNIFICANT (Y/N)

Y* indicates that the system is an assumed support system within the PRA for a system that PRA has identified as "Risk Significant".