TECHNICAL SUPPORT GUIDELINES

START

CONTROL PARAMETER ASSESSMENT

- **Monitor key QGA/SAMG parameters (Detail A).**
  - Compensate for off-calibration conditions as required
- **Evaluate effects of plant conditions and operator actions on instruments being used.**
  - Evaluate instrument availability using questions in Detail B.
  - Watch for conditions listed in Detail C
  - If direct indications are unavailable, identify alternative methods.
- **Forecast future values as required.**
  - Use linear extrapolation.

SYSTEM STATUS ASSESSMENT

- **Monitor QGA/SAMG systems (Detail D).**
  - Evaluate system availability using questions in Detail E.
  - Evaluate the effects of changing plant conditions upon future system availability.
- **Determine priorities for returning systems to service.**
  - Use criteria listed in Detail F

QGA/SAMG ACTION ASSESSMENT

- **Evaluate the optimum timing of QGA/SAMG actions (Detail G).**
  - Use TSG Reference Manual, Attachment E, for containment venting considerations.
- **Provide support for key QGA/SAMG decisions.**
  - If RPV water level cannot be restored and maintained above -142 in. (TAF), monitor for RPV breach by core debris (Detail H).

A Key QGA/SAMG Parameters

- **RPV Parameters**
  - RPV water level
  - RPV pressure
  - Reactor power
  - RPV injection flow
  - RPV metal temperatures
- **Primary Containment Parameters**
  - Torus temperature
  - Drywell temperature
  - Primary containment pressure
  - Primary containment water level
  - Primary containment H_2/O_2
  - Primary containment radiation level
  - Primary containment injection flow
  - Drywell spray flow
- **Secondary Containment Parameters**
  - Secondary containment temperature
  - Secondary containment radiation
  - Secondary containment water level
- **Site Parameters**
  - Offsite radioactivity release rate

B Instrument Availability

If the answer to any of the following questions is "no," the instrument may be inaccurate or unavailable

- Is the parameter value within the instrument indicating range?
- Is power available to all instrument components?
- Is the instrument calibrated for use under the existing conditions?
- Is the instrument reading consistent with other indications and the expected trend?
- Are the readout locations accessible?
- Are all instrument components undamaged?
- Can the instrument function in the existing environment?

C Conditions Affecting Parameter Indications

Condition	Effects
Rapid RPV depressurization	Inaccurate or invalid cold reference leg RPV water level indications due to gases coming out of solution.
High drywell or secondary containment temperatures near RPV water level instrument runs	Inaccurate or invalid RPV water level indications
Rising primary containment water level	Flooding of electrical equipment in the primary containment. Increased hydrostatic head on submerged pressure taps

D QGA/SAMG Systems

- **Injection Systems**
  - Condensate/Feedwater
  - HPCI
  - SSMP from CCST
  - RCIC
  - CRD
  - Core Spray
  - LPCI
  - SBLC from Boron tank
  - SBLC from Test tank
  - CRD Cross-tie
  - Standby Coolant
  - Condensate Cross-tie
  - SSMP from Fire System
  - Fire System through SSMP
  - Fire System through RHR
  - HPCI Cooling Water Pump
  - ECCS Keep-Fill
- **RPV Pressure Control Systems**
  - Main Turbine bypass valves
  - ADS Valves
  - HPCI
  - RCIC
  - MSL drains
  - RWCU in blowdown
  - RWCU in recirc
  - Shutdown Cooling
  - Head Vent
- **Reactivity Control Systems**
  - RPS
  - ARI
  - RMC
  - SBLC
  - Alternate boron injection via RWCU
- **Electrical Systems**
  - Emergency Diesel Generator
  - SBO Diesel Generator
- **Ventilation**
  - Reactor Building Vents
  - SBGT
  - Turbine Building Vents
- **Primary Containment Systems**
  - Torus Cooling
  - Drywell coolers
  - SBGT
  - Vent and Purge Systems

E System Availability

If the answer to any of the following questions is "no," system availability may be limited:

- Is power available to all system components?
- Is the system unisolated?
- Are all required support systems available?
  - Control power
  - Motive power
  - Pneumatics
  - Cooling water
  - Lube oil, etc.
- Are all operating interlocks satisfied?
- Are all necessary prerequisites satisfied?
- Can the necessary valve lineups be established?
- Are plant parameters within allowable ranges?
- Are the necessary system controls accessible?
- Are all system components undamaged?
- Can the system function in the existing environment?
- Is it expected that all required conditions will continue to exist?

F System Prioritization

"Yes" answers to the following questions indicate higher priority:

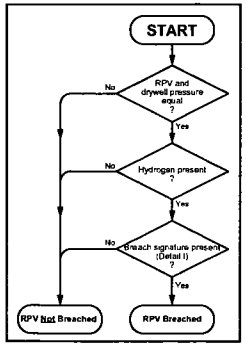
- Is the system needed for establishing or maintaining control of an QGA or SAMG parameter?
- Is the parameter controlled by the system at or near an QGA or SAMG action level?
  - Does the action level challenge core cooling, RPV integrity, or containment integrity?
  - Does the action level require an undesirable response?
- Is it expected that the system will be effective if restored to service?
  - Will the system be usable under the expected plant conditions?
  - Will the system be capable of controlling the parameter of concern?
- Is there a possibility that the system can be returned to service?
  - Is any damage repairable?
  - Are replacement components and repair materials available?
  - Are the locations where work must be performed accessible?
  - Are the necessary personnel available?
- Can the system be returned to service in time to be of value?

G Timing of QGA/SAMG Actions

"Yes" answers to the following questions favor taking action now.

- Has an action level been reached, or is it likely that an action level will be reached before the parameter trend can be reversed?
- Does the action level challenge core cooling, RPV integrity, or containment integrity?
- Is there a potential benefit to the action?
  - Will the action reverse the parameter trend?
  - Will the action place the plant in a safer condition?
  - Will the action facilitate control of other parameters?
- Is it possible to perform the action now?
  - Are the necessary systems and equipment available?
  - Are the necessary personnel available?
  - Is the area where the action is taken accessible?
  - Are all prerequisites satisfied?
- Is it more likely that the action will be successful or of greater benefit now rather than later?
  - Will the necessary systems or equipment be unavailable later?
  - Will the necessary personnel be unavailable later?
  - Will the area where the action is taken be inaccessible later?
  - Will prerequisites not be satisfied later?
- Will any undesirable effects of the action be reduced by taking the action now rather than later?
  - Will the offsite radioactivity release be reduced?
  - Will personnel exposure be reduced?
- Are plant and environmental conditions more favorable to taking the action now rather than later?
  - Will the offsite radioactivity release be reduced?
  - Will personnel exposure be reduced?

H RPV Breach Evaluation



I RPV Breach Signature

If all of the following conditions which can be observed are observed, consider the RPV breached

- **Prolonged existence of:**
  - RPV water level below -287 in. (BAF)
  - RPV injection flow below MDRIR
  - RPV lower head metal temperature above (575°F) (design temperature)
- **Concurrent existence of:**
  - Increasing drywell pressure trend
  - Decrease in difference between RPV pressure and drywell pressure
  - Increasing drywell temperature trend

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