

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 AUTH. NAME: AUTHOR AFFILIATION
 BASKIN, K.P. C-E Operating Plants Owners Group
 RECIP. NAME: RECIPIENT AFFILIATION
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SUBJECT: Responds to conclusions stated in NRC safety evaluation re
 C-E guidelines for steam generator tube rupture & loss of
 main feedwater. Revision to C-E emergency procedure
 guidelines will incorporate response.

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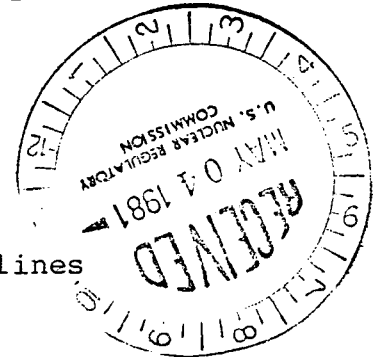
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IF

50-361
P.O. Box 800
2244 Walnut Grove Avenue
Rosemead, CA 91777

May 1, 1981

Mr. Brian Sheron
Reactor Systems Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555



Subject: C-E Generic Emergency Procedure Guidelines

Dear Mr. Sheron:

In support of your current review of the Emergency Operating Instructions for San Onofre Nuclear Generating Station, Units 2 and 3, two enclosures are provided. The contents of these enclosures respond to requests stated in the NRC letter to the C-E Owners Group dated March 6, 1981 and are consistent with discussions between members of your staff, Southern California Edison, and Combustion Engineering at a meeting on April 10, 1981.

The following enclosures are provided:

1. Responses to conclusions stated in the NRC Safety Evaluation Report on the C-E guideline for the Steam Generator Tube Rupture.
2. Response to conclusions stated in the NRC Safety Evaluation Report on the C-E guideline for the Loss of Main Feedwater.

In addition to being provided for your review at this time, the substance of these responses is being included in revisions currently being made to the C-E emergency procedure guidelines to consider multiple failures. This revision and the schedule for submittal of revised emergency procedure guidelines to NRC for review were discussed with you and members of your staff at a meeting on January 30, 1981.

If I can be of further assistance to you in this matter, please feel free to contact me at (213) 572-1401.

Sincerely,

J P Gasper for
Kenneth P. Baskin
Chairman
C-E Owners Group

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1/1

KPB:el

Enclosures

xc: D. Beckham, NRC
J. Gasper, C-E Owners Group
W. Burchill, C-E

F 8105050550

SER Question on SGTR Guideline

1. A review by C-E must be completed on the use of a smaller sub-cooling margin criteria for HPI termination. Inclusion of a pressurizer level indication in conjunction with a subcooling margin should be incorporated in the HPI termination criteria sections of the guideline unless justification for its exclusion can be made.

Pressurizer level indication:

The requirement that a pressurizer level be indicated when terminating safety injection is included in the SGTR Guideline. See below.

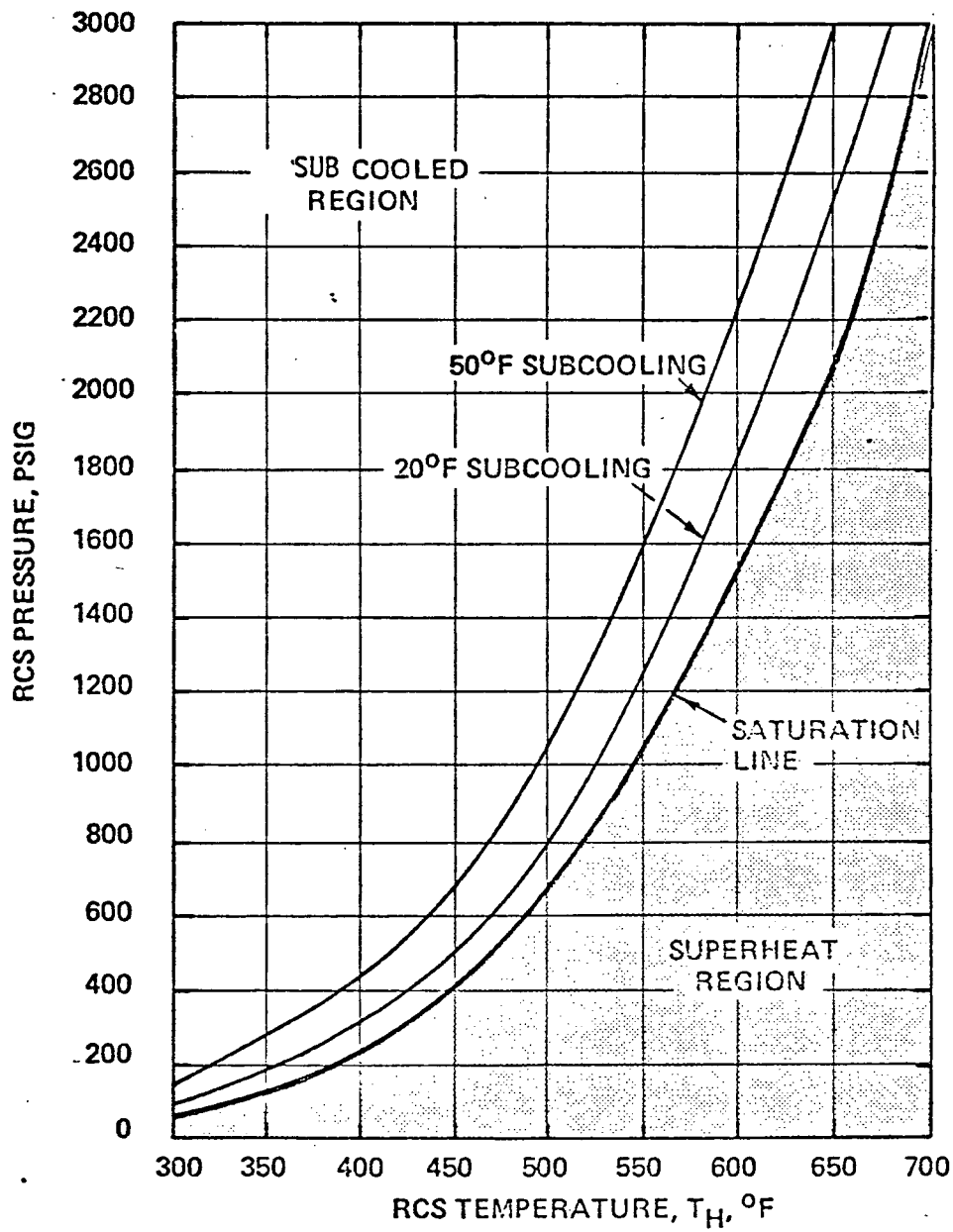
Smaller subcooled margin:

The requirement that a $20^{\circ}\text{F} + [\text{inaccuracies}]$ subcooled margin exists at safety injection termination is included in the SGTR Guideline. In addition, the guideline states that if this subcooling margin cannot be maintained, the Safety Injection System must be restarted. See below.

Excerpt from SGTR Guideline:

- ✓ After an SIAS operate the [SIS] until:
- a) RCS hot and cold leg temperatures are at least $20^{\circ}\text{F} + [\text{inaccuracies}]$ below saturation temperature for pressurizer pressure (refer to Figure 2),
 - b) a pressurizer level is indicated,
 - c) one steam generator has an indicated level and is removing heat from the RCS.

Figure 2
SATURATION



✓ If $20^{\circ}\text{F} + [\text{inaccuracies}]$ of subcooling cannot be maintained after the SIS has been stopped, the HPSIS must be restarted.

Overview on the use of a smaller subcooling margin:

For a SGTR event one of the main objectives is to equilibrate RCS and steam generator pressures to terminate primary to secondary leakage within the steam generators. An exact pressure equilibrium (and a consequential total stoppage of leak flow) cannot be achieved if a subcooling condition is also required. The guideline's original 50°F subcooling criteria translates to an approximate 500 psig margin (in the pressure range of interest (see Figure 2) making it overly difficult to equilibrate. Operators and analysts agree that a $20^{\circ}\text{F} + [\text{inaccuracies}]$ margin is more operationally suitable. It remains conservative, and in addition, allows each plant to make this margin plant specific by adding in the inaccuracies expected in their plants at the time of a SGTR event.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the SGTR Guideline will contain the above mentioned information.

SER Question on SGTR Guideline

2. Modifications to the Natural Circulation guideline are necessary to consider the event at the St. Lucie plant where voiding occurred in the upper head during natural circulation cooldown.

Modifications to the Natural Circulation Guideline:

The event experienced at the St. Lucie Plant where voiding occurred in the upper head during a natural circulation cooldown has been studied, resulting in modifications to the latest revisions of the CE Guidelines. For the case where RCP operation is not possible during a SGTR event, the SGTR Guideline refers the operator to the Loss of Forced Reactor Coolant Flow Guideline to accomplish a natural circulation cooldown concurrently with the SGTR Guideline. See below.

Excerpt from the SGTR Guideline:

- ✓ If RCP operation is not possible, perform the following activities (listed in order of decreasing preference):
 - a) If possible, maintain RCS heat removal until the RCPs can be restarted, then resume an orderly cooldown and depressurization.
 - b) Cooldown using natural circulation per the Loss of Forced Reactor Coolant Flow Guideline concurrently with this Guideline.

Once in the Loss of Forced Reactor Coolant Flow Guideline, the operator will find explicit instruction on void occurrences and their elimination. See below.

Excerpt from the Loss of Forced Reactor Coolant:

- ✓ During the RCS depressurization monitor for void formation. Indications of possibilities of voids are:
 - a) A pressurizer level increase significantly greater than expected
 - b) A pressurizer level decrease while operating charging
 - c) If the Pressurizer Level Control System is in automatic, an unanticipated letdown flow greater than charging flow

✓ If voiding of the RCS is indicated, perform the following:

- a) Isolate letdown
- b) Stop the depressurization
- c) Stop the RCS cooldown
- d) Repressurize the RCS to eliminate the void by operating pressurizer heaters or HPSI and charging pumps.

✓ [If the void formation is suspected to be non-condensable gases, operate the reactor vessel head vent as necessary to eliminate the gases].

In addition, the bases section of the Loss of Forced Reactor Coolant Guideline thoroughly explains the intent and theory behind each action step delineated above.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the SGTR guideline and the Loss of Forced Reactor Coolant Flow Guideline will contain the above-mentioned information.

*[] indicates plant specific information within the generic guideline.

SER Question on SGTR Guideline

3. Additional detail on methods available to cool and depressurize both the primary system and the faulted steam generator must be included in the guideline. Special consideration must be given to plant cooldown when the reactor coolant pumps are not in operation, and criteria which would allow pump restart for cooldown purposes should be considered. Suggested cooldown methods should minimize environmental releases.

Additional detail on methods to cool and depressurize both the primary system and the faulted steam generator:

Additional detail on the methods available to cool and depressurize both the primary system and the faulted steam generator have been included in the latest SGTR Guideline. CE is complete in its instruction by specifying the preferred activities used for a cooldown and depressurization (prioritized by equipment availability). Additional cooldown and depressurization methods which are plant specific and not appropriate to list in the generic SGTR Guideline may be included in the plant's own SGTR emergency guideline.

Plant Cooldown when the RCPs are not in operation:

Special consideration has been given to a plant cooldown when the RCPs are not operating. If a Loss of Forced Reactor Coolant Flow is incurred, the operator is instructed to refer to the Loss of Forced Reactor Coolant Flow Guideline. Within this guideline the operator will find specific guidance on cooling the faulted generator so it cannot impede natural circulation flow if it becomes a heat source. See Below.

Excerpt from Loss of Forced RC Flow Guideline:

- ✓ If a steam generator was isolated following a SGTR event, continue the natural circulation cooldown by performing the following activities (listed in order of preference):
 - a) If possible, restart one RCP in each loop to establish cooling of the isolated steam generator.

- b) Periodically drain and refill the isolated steam generator with feedwater.

Criteria to allow pump restart:

Criteria which, if satisfied, would allow RCP restart for cooldown purposes has been added to the SGTR Guideline. As the event progresses and a cooldown is necessitated, a forced flow cooldown is preferred. The operator is urged to restart the RCPs if at all possible. See below.

Excerpt from the SGTR Guideline:

- ✓ Determine if RCP operation is possible by noting if all of the following criteria are satisfied:
 - a) The unaffected steam generator is removing heat from the RCS.
 - b) Pressurizer level and pressure are responding to the Pressurizer Level and Pressure Control System.
 - c) The RCS is greater than or equal to 20°F + [inaccuracies] subcooled.
 - d) [Other criteria satisfied per RCP operating instructions].
- ✓ If RCP operation is possible, perform the following activities:
 - a) Start one reactor coolant pump in each loop.
 - b) Resume an orderly reactor plant cooldown and depressurization....

Cooldown methods to minimize environmental releases:

Suggested cooldown methods are prioritized to minimize the occurrence of an environmental release. A precaution concerning this subject is included in the SGTR Guideline. The bases section describes the intent of the precaution. See below.

Excerpt from SGTR Guideline:

- ✓ Minimize the use of the atmospheric steam dump valves.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the SGTR Guideline will contain the above-mentioned information.

*[] indicates plant specific information within the generic guideline.

SER Question on SGTR Guideline

4. More explicit guidance must be provided for situations where loss of offsite power has occurred concurrent with a steam generator tube rupture, particularly regarding equipment availability.

A loss of offsite power occurring concurrently with a SGTR:

The fact that a loss of offsite power may occur concurrently with a SGTR will not prevent the operator, if implementing the SGTR Guideline, from depressurizing the RCS, removing RCS heat and mitigating the effects of the SGTR event. This is because the SGTR Guideline addresses depressurization and heat removal in terms of the operator using all available plant equipment. Although some systems and equipment may be used preferentially to accomplish specific safety functions, CE recognizes that these systems may become unavailable at the occurrence of a loss of offsite power. Consequently, alternative methods of accomplishing specific safety functions are provided. In addition, plant specific methodology on cooling and depressurization not appropriate in a generic guideline may be included in plant specific procedures.

Redundancy and diversity of systems and equipment needed to accomplish all the safety functions in the SGTR Guideline, in light of a loss of offsite power situation, are inherent in C-E's plant design.

SER Question on SGTR Guideline

5. More specific guidance must be provided on actions to recover from an inadequate core cooling situation, taking into consideration the possibility of multiple system and component failures. Additionally, information on ICC in the basis section of the guideline must also be incorporated into the operator action section. This guideline is considered applicable only for those plants with CE-designed NSSSs which have low shutoff head HPI pumps. Use of this guideline to develop procedures for plants with high head HPI pumps (i.e., Maine Yankee) will require further justification regarding applicability.

Guidance on actions to recover from an inadequate core cooling situation:

As part of The C-E Owners Group activities, workshops on C-E Emergency and Abnormal Event Guidelines have been conducted. One of the products of these workshops includes a compilation of comments aimed at improving the guidelines. C-E's guidance on inadequate core cooling has been discussed. Plant specific information from the participating utilities has been collected on equipment availability in the recovery from an inadequate core cooling situation. The workshop participants have discussed the possibility of multiple system and component failures. This type of information, along with actions resulting from the information already present in the SGTR Guideline basis section will be incorporated into the guideline section. It is important to note, however, that as the guideline section presently stands, the specified required actions will prevent the plant from moving from a SGTR event toward a situation in which the core is inadequately cooled.

SGTR Guideline applicability to the Maine Yankee plant:

The SGTR Guideline is considered to be applicable to the Maine Yankee Plant. A response to this question may be found in a

letter from Kenneth P. Baskin, Chairman of C-E Owners Group
to Mr. Brian Sheron, Reactor Systems Branch of the NRC on
January 30, 1981.

SER Question on LOF Guideline

1. Each applicant utilizing these guidelines must provide assurance that the limit for thermal shocking of the steam generators (8 feedings when dry) is not exceeded.

Assurance that the limit for thermal shocking is not exceeded:

The structural integrity of a typical steam generator can be maintained with at least 8 feedings after dryout.

Precautions in the basis section of the LOF Guideline are provided to limit unnecessary thermal stresses on the steam generators and to avoid damage resulting from repetitive feeding of dry steam generators. The calculations done to arrive at the above limit are quite conservative, and provide assurance that in the field, structural failure due to thermal shocking of the steam generators does not occur.

Additionally, a precaution has been added which addresses steam generator refills. See below.

Excerpt from Loss of Feedwater Guideline:

- ✓ The operator should not add feedwater to a dry steam generator if another steam generator still contains water. Re-establish feedwater only to the steam generator that is not dry. If both steam generators become dry, refill only one steam generator to re-initiate core cooling.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the LOF Guideline will contain the above-mentioned information.

SER Question on LOF Guideline

2. Specific guidance for actions to be taken following a loss of offsite power must be incorporated. Plant specific procedures derived from this guidance should identify the equipment to be used in mitigating a LOOP-induced loss of feedwater.

A loss of offsite power occurring concurrently with a loss of feedwater:

The response to Question #4 of the SGTR Questions is entirely applicable to a Loss of feedwater situation. Please refer to SGTR Question #4 for the substance of this applicability.

SER Question on LOF Guideline

3. Current natural circulation guidelines must be modified to consider the possibility of voiding in the upper head during cooldown.

Modifications to the Natural Circulation Guideline:

Modifications to the Loss of Forced Reactor Coolant Flow Guideline have been made which address actions required during a natural circulation cooldown to avoid and eliminate voiding. These explicit actions are delineated in the response to Question #2 of the SGTR Questions. Please refer to Question #2 for details.

4. Each plant specific procedure utilizing this guideline must identify methods for making alternate sources of auxiliary feedwater available.

Revisions identifying alternate sources of auxiliary feedwater:

Activities which are performed following the loss of feedwater include managing heat removal in the RCS secondary side, inventory control, and either regaining feedwater or providing any plant specific supplies of auxiliary feedwater to the steam generators.

The guideline "Bases" section will provide some examples of alternate feedwater sources. Because alternate sources of auxiliary feedwater are quite plant specific, they are not appropriate to list in a generic LOF "Guideline". Instead, they will be inserted by the plant in an action step (d) prepared for that purpose. See below.

Excerpt from LOF Guideline:

- ✓ If all feedwater (main and auxiliary) is lost, conduct the following activities:
 - a) Reduce the number of operating RCPs to one per loop to minimize heat input into the RCS.
 - b) Secure steam generator blowdown, secondary sampling and any non-vital steam discharge.
 - c) Take actions to regain main or auxiliary feedwater system operation.
 - d) [If other sources of water are available for steam generator heat removal, insert that information here].
 - e) [If other methods are available for heat removal from the RCS, insert that information here].
 - f) [Open the PORVs and actuate the HPSI pumps aligned to cold legs].

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the LOF Guideline will include the above-mentioned information.

*[] indicates plant specific information within the generic guidelines.

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 AUTH. NAME: SHERON, B. AUTHOR AFFILIATION: C-E Operating Plants Owners Group
 BASKIN, K. P. RECIPIENT AFFILIATION: Reactor Systems Branch
 RECIP. NAME: SHERON, B.
 SHERON, B.

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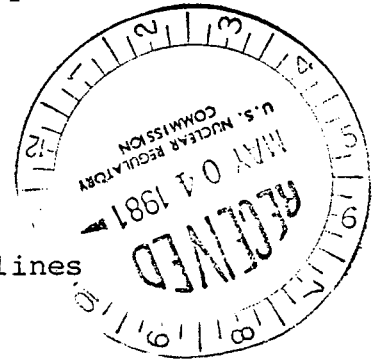
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50-261
P.O. Box 800
2244 Walnut Grove Avenue
Rosemead, CA 91777

May 1, 1981

Mr. Brian Sheron
Reactor Systems Branch
Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555



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K P Baskin
Kenneth P. Baskin
Chairman
C-E Owners Group

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Enclosures

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Smaller subcooled margin:

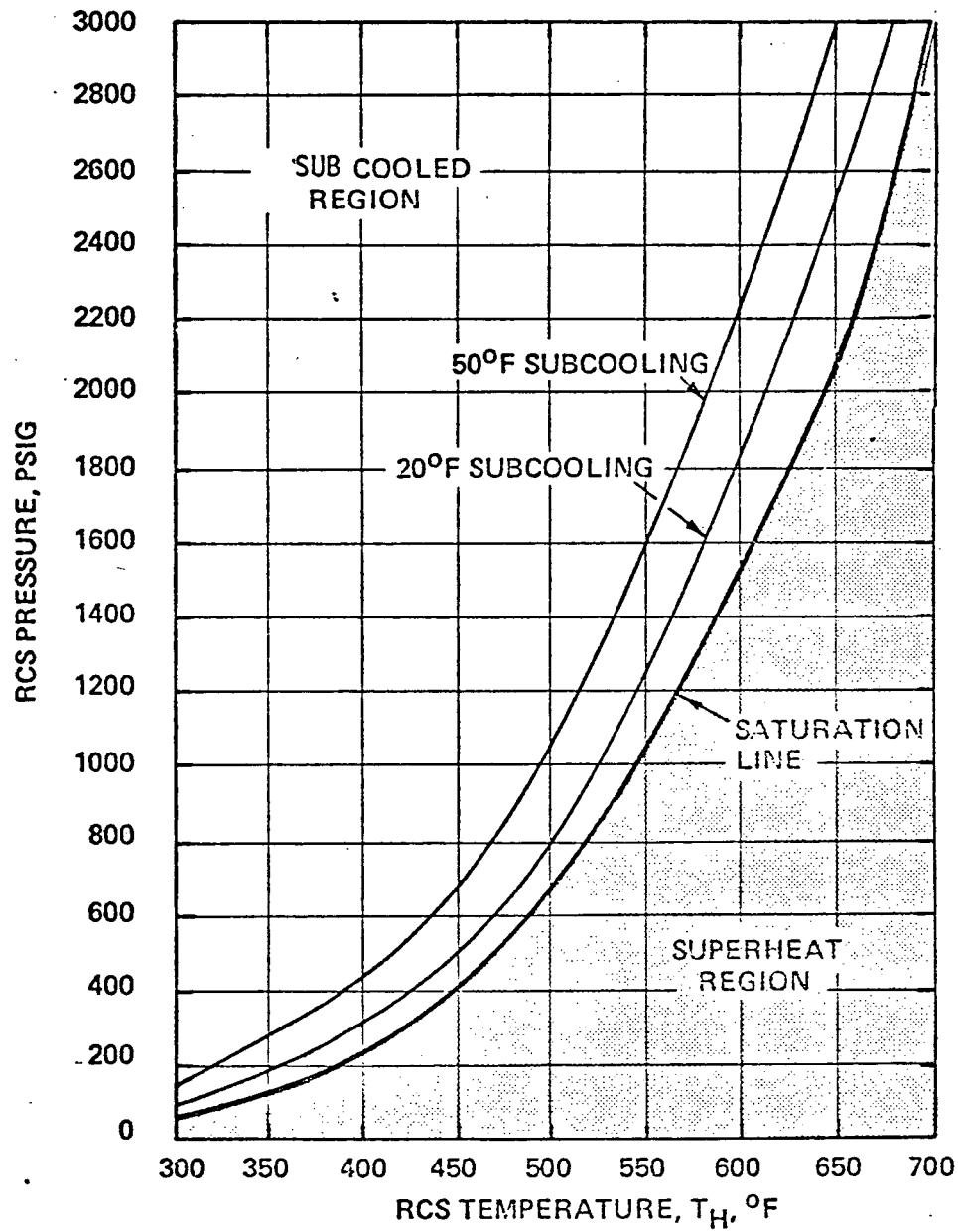
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Figure 2
SATURATION



✓ If $20^{\circ}\text{F} + [\text{inaccuracies}]$ of subcooling cannot be maintained after the SIS has been stopped, the HPSIS must be restarted.

Overview on the use of a smaller subcooling margin:

For a SGTR event one of the main objectives is to equilibrate RCS and steam generator pressures to terminate primary to secondary leakage within the steam generators. An exact pressure equilibrium (and a consequential total stoppage of leak flow) cannot be achieved if a subcooling condition is also required. The guideline's original 50°F subcooling criteria translates to an approximate 500 psig margin (in the pressure range of interest (see Figure 2) making it overly difficult to equilibrate. Operators and analysts agree that a $20^{\circ}\text{F} + [\text{inaccuracies}]$ margin is more operationally suitable. It remains conservative, and in addition, allows each plant to make this margin plant specific by adding in the inaccuracies expected in their plants at the time of a SGTR event.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the SGTR Guideline will contain the above mentioned information.

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Modifications to the Natural Circulation Guideline:

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Excerpt from the SGTR Guideline:

- ✓ If RCP operation is not possible, perform the following activities (listed in order of decreasing preference):
 - a) If possible, maintain RCS heat removal until the RCPs can be restarted, then resume an orderly cooldown and depressurization.
 - b) Cooldown using natural circulation per the Loss of Forced Reactor Coolant Flow Guideline concurrently with this Guideline.

Once in the Loss of Forced Reactor Coolant Flow Guideline, the operator will find explicit instruction on void occurrences and their elimination. See below.

Excerpt from the Loss of Forced Reactor Coolant:

- ✓ During the RCS depressurization monitor for void formation. Indications of possibilities of voids are:
 - a) A pressurizer level increase significantly greater than expected
 - b) A pressurizer level decrease while operating charging
 - c) If the Pressurizer Level Control System is in automatic, an unanticipated letdown flow greater than charging flow

✓ If voiding of the RCS is indicated, perform the following:

- a) Isolate letdown
- b) Stop the depressurization
- c) Stop the RCS cooldown
- d) Repressurize the RCS to eliminate the void by operating pressurizer heaters or HPSI and charging pumps.

✓ [If the void formation is suspected to be non-condensable gases, operate the reactor vessel head vent as necessary to eliminate the gases].

In addition, the bases section of the Loss of Forced Reactor Coolant Guideline thoroughly explains the intent and theory behind each action step delineated above.

Schedule for resolution:

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SER Question on SGTR Guideline

3. Additional detail on methods available to cool and depressurize both the primary system and the faulted steam generator must be included in the guideline. Special consideration must be given to plant cooldown when the reactor coolant pumps are not in operation, and criteria which would allow pump restart for cooldown purposes should be considered. Suggested cooldown methods should minimize environmental releases.

Additional detail on methods to cool and depressurize both the primary system and the faulted steam generator:

Additional detail on the methods available to cool and depressurize both the primary system and the faulted steam generator have been included in the latest SGTR Guideline. CE is complete in its instruction by specifying the preferred activities used for a cooldown and depressurization (prioritized by equipment availability). Additional cooldown and depressurization methods which are plant specific and not appropriate to list in the generic SGTR Guideline may be included in the plant's own SGTR emergency guideline.

Plant Cooldown when the RCPs are not in operation:

Special consideration has been given to a plant cooldown when the RCPs are not operating. If a Loss of Forced Reactor Coolant Flow is incurred, the operator is instructed to refer to the Loss of Forced Reactor Coolant Flow Guideline. Within this guideline the operator will find specific guidance on cooling the faulted generator so it cannot impede natural circulation flow if it becomes a heat source. See Below.

Excerpt from Loss of Forced RC Flow Guideline:

- ✓ If a steam generator was isolated following a SGTR event, continue the natural circulation cooldown by performing the following activities (listed in order of preference):
 - a) If possible, restart one RCP in each loop to establish cooling of the isolated steam generator.

- b) Periodically drain and refill the isolated steam generator with feedwater.

Criteria to allow pump restart:

Criteria which, if satisfied, would allow RCP restart for cooldown purposes has been added to the SGTR Guideline. As the event progresses and a cooldown is necessitated, a forced flow cooldown is preferred. The operator is urged to restart the RCPs if at all possible. See below.

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- ✓ Determine if RCP operation is possible by noting if all of the following criteria are satisfied:
 - a) The unaffected steam generator is removing heat from the RCS.
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- ✓ If RCP operation is possible, perform the following activities:
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Cooldown methods to minimize environmental releases:

Suggested cooldown methods are prioritized to minimize the occurrence of an environmental release. A precaution concerning this subject is included in the SGTR Guideline. The bases section describes the intent of the precaution. See below.

Excerpt from SGTR Guideline:

- ✓ Minimize the use of the atmospheric steam dump valves.

Schedule for resolution:

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A loss of offsite power occurring concurrently with a SGTR:

The fact that a loss of offsite power may occur concurrently with a SGTR will not prevent the operator, if implementing the SGTR Guideline, from depressurizing the RCS, removing RCS heat and mitigating the effects of the SGTR event. This is because the SGTR Guideline addresses depressurization and heat removal in terms of the operator using all available plant equipment. Although some systems and equipment may be used preferentially to accomplish specific safety functions, CE recognizes that these systems may become unavailable at the occurrence of a loss of offsite power. Consequently, alternative methods of accomplishing specific safety functions are provided. In addition, plant specific methodology on cooling and depressurization not appropriate in a generic guideline may be included in plant specific procedures.

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5. More specific guidance must be provided on actions to recover from an inadequate core cooling situation, taking into consideration the possibility of multiple system and component failures. Additionally, information on ICC in the basis section of the guideline must also be incorporated into the operator action section. This guideline is considered applicable only for those plants with CE-designed NSSSs which have low shutoff head HPI pumps. Use of this guideline to develop procedures for plants with high head HPI pumps (i.e., Maine Yankee) will require further justification regarding applicability.

Guidance on actions to recover from an inadequate core cooling situation:

As part of The C-E Owners Group activities, workshops on C-E Emergency and Abnormal Event Guidelines have been conducted. One of the products of these workshops includes a compilation of comments aimed at improving the guidelines. C-E's guidance on inadequate core cooling has been discussed. Plant specific information from the participating utilities has been collected on equipment availability in the recovery from an inadequate core cooling situation. The workshop participants have discussed the possibility of multiple system and component failures. This type of information, along with actions resulting from the information already present in the SGTR Guideline basis section will be incorporated into the guideline section. It is important to note, however, that as the guideline section presently stands, the specified required actions will prevent the plant from moving from a SGTR event toward a situation in which the core is inadequately cooled.

SGTR Guideline applicability to the Maine Yankee plant:

The SGTR Guideline is considered to be applicable to the Maine Yankee Plant. A response to this question may be found in a

letter from Kenneth P. Baskin, Chairman of C-E Owners Group
to Mr. Brian Sheron, Reactor Systems Branch of the NRC on
January 30, 1981.

SER Question on LOF Guideline

1. Each applicant utilizing these guidelines must provide assurance that the limit for thermal shocking of the steam generators (8 feedings when dry) is not exceeded.

Assurance that the limit for thermal shocking is not exceeded:

The structural integrity of a typical steam generator can be maintained with at least 8 feedings after dryout.

Precautions in the basis section of the LOF Guideline are provided to limit unnecessary thermal stresses on the steam generators and to avoid damage resulting from repetitive feeding of dry steam generators. The calculations done to arrive at the above limit are quite conservative, and provide assurance that in the field, structural failure due to thermal shocking of the steam generators does not occur.

Additionally, a precaution has been added which addresses steam generator refills. See below.

Excerpt from Loss of Feedwater Guideline:

- ✓ The operator should not add feedwater to a dry steam generator if another steam generator still contains water. Re-establish feedwater only to the steam generator that is not dry. If both steam generators become dry, refill only one steam generator to re-initiate core cooling.

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the LOF Guideline will contain the above-mentioned information.

SER Question on LOF Guideline

2. Specific guidance for actions to be taken following a loss of offsite power must be incorporated. Plant specific procedures derived from this guidance should identify the equipment to be used in mitigating a LOOP-induced loss of feedwater.

A loss of offsite power occurring concurrently with a loss of feedwater:

The response to Question #4 of the SGTR Questions is entirely applicable to a Loss of feedwater situation. Please refer to SGTR Question #4 for the substance of this applicability.

SER Question on LOF Guideline

3. Current natural circulation guidelines must be modified to consider the possibility of voiding in the upper head during cooldown.

Modifications to the Natural Circulation Guideline:

Modifications to the Loss of Forced Reactor Coolant Flow Guideline have been made which address actions required during a natural circulation cooldown to avoid and eliminate voiding. These explicit actions are delineated in the response to Question #2 of the SGTR Questions. Please refer to Question #2 for details.

4. Each plant specific procedure utilizing this guideline must identify methods for making alternate sources of auxiliary feedwater available.

Revisions identifying alternate sources of auxiliary feedwater:

Activities which are performed following the loss of feedwater include managing heat removal in the RCS secondary side, inventory control, and either regaining feedwater or providing any plant specific supplies of auxiliary feedwater to the steam generators.

The guideline "Bases" section will provide some examples of alternate feedwater sources. Because alternate sources of auxiliary feedwater are quite plant specific, they are not appropriate to list in a generic LOF "Guideline". Instead, they will be inserted by the plant in an action step (d) prepared for that purpose. See below.

Excerpt from LOF Guideline:

- ✓ If all feedwater (main and auxiliary) is lost, conduct the following activities:
 - a) Reduce the number of operating RCPs to one per loop to minimize heat input into the RCS.
 - b) Secure steam generator blowdown, secondary sampling and any non-vital steam discharge.
 - c) Take actions to regain main or auxiliary feedwater system operation.
 - d) [If other sources of water are available for steam generator heat removal, insert that information here].
 - e) [If other methods are available for heat removal from the RCS, insert that information here].
 - f) [Open the PORVs and actuate the HPSI pumps aligned to cold legs].

Schedule for resolution:

The C-E Owners Group June, 1981, submittal of the LOF Guideline will include the above-mentioned information.

*[] indicates plant specific information within the generic guidelines.