

REACTOR SAFETY
PROCEDURES

RS - 003

TECHNICAL VERIFICATION OF NUCLEAR STATION
EMERGENCY PROCEDURES AND GUIDELINES

Implementation Date

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RS - 003

TECHNICAL VERIFICATION OF NUCLEAR STATION
EMERGENCY PROCEDURES AND GUIDELINES

Purpose

This procedure outlines an appropriate method for performing the technical verification of nuclear station emergency procedures, plant specific emergency procedure guidelines, and NSSS vendor guidelines. The procedure is applicable to both the initial verification and the long term maintenance of the plant specific guidelines and emergency procedure revisions.

TECHNICAL VERIFICATION OF NUCLEAR STATION
EMERGENCY PROCEDURES AND GUIDELINES

1.0 INTRODUCTION

NUREG-0737, "Clarification of TMI Action Plan Requirements," I.C.1, "Guidance for the Evaluation and Development of Procedures for Transients and Accidents," outlined requirements for upgrading nuclear station emergency procedures. This was followed by SECY-82-111B/Supplement 1, "Requirements for Emergency Response Capability," which provides further clarification for upgrading emergency procedures. A major area for concern is the requirements for a verification and validation (V&V) program to be performed and maintained prior to implementation of the upgraded procedures and future revisions to the procedures.

The verification program consists of two activities. First, a verification to assure written correctness is performed. A subsequent verification is concerned with technical content and accuracy. The validation program determines that the procedures will work in a control room environment in real time. This procedure is concerned only with the verification for technical content and accuracy.

Although the objective is to verify the technical accuracy of the station emergency procedures, it also necessarily involves verification of the background and reference documents used by the procedure writer. The background and reference documents of interest are the NSSS vendor guidelines, and the plant specific emergency procedure guidelines.

This procedure specifies an appropriate method for verification of the background and reference documents used by the emergency procedure author, and also for the verification of the proposed emergency procedure. The procedure results in a format for a comprehensive and thorough technical review which is documented in an efficient and traceable manner. The procedure also provides for resolution of outstanding concerns.

2.0 SCOPE

This procedure is for implementation within Reactor Safety.

3.0 APPLICABILITY

This procedure is applicable to the initial technical verification of NSSS vendor guidelines, plant specific emergency procedure guidelines, and emergency procedures for all nuclear stations. It is also applicable to the long term maintenance of the plant specific guidelines, and to technical verification of emergency procedure revisions.

4.0 TECHNICAL VERIFICATION OF NSSS VENDOR GUIDELINES

4.1 Initial Verification

4.1.1 Objective

The objective of the initial verification of the vendor guidelines is to determine that the guidelines provide correct and achievable methods for mitigation of plant transients. The verification process shall also determine the completeness and the limits of applicability of the guidelines. The results of the initial verification are utilized for correcting and updating the plant specific guidelines.

4.1.2 Method

The vendor guidelines are based on an integration of analysis, operating experience, and engineering judgment. The verification process shall assess the correctness and reasonableness of the analytical bases, the interpretation of lessons learned from operating experience, and the logic and thought processes utilized to convert knowledge into procedures. The method for verification is detailed in the following sections.

4.1.2.1 Verifier Qualifications

The Lead Safety Analysis Engineer shall determine that the verifier is qualified to perform the technical verification of vendor guidelines.

4.1.2.2 Control of the Document

The version of the document undergoing verification shall be controlled and uniquely specified. Revisions and updates to the documents require subsequent verification.

4.1.2.3 Guideline Review

The verifier shall develop a list of review comments which record observations of errors, inconsistencies, omissions, etc., of any nature. The comments shall pertain directly to the guideline documentation but may also include any and all observations related to the guidelines regardless of the source. The verifier may include information from available sources related to the vendor guidelines in the verification process.

The review comments shall then be evaluated and insignificant comments shall be discarded. The remaining comments shall be formally documented per 4.1.3.1.

4.1.2.4 Evaluation of Guideline Review

Following formal documentation of the review comments, an evaluation shall be made for each comment. The evaluation shall result in a recommendation for resolution of the comment. The evaluation shall be documented per 4.1.3.2.

4.1.2.5 Verification

The verifier shall initiate verification documentation per 4.1.3.3. Each evaluation from 4.1.2.4 which resulted in a recommendation for resolution shall be documented. The document is verified when the following conditions are met:

1. Technical content and accuracy.
2. Consistent with FSAR licensing basis.
3. Based on sound operating principles and engineering judgment.

The document is verified when each evaluation item is addressed and resolved, or a program to provide resolution is documented. Evaluations which require a program to provide resolution must include documentation which justifies the acceptability of long term resolution. This documentation shall support the conclusion that no safety concern exists.

4.1.3 Documentation

4.1.3.1 Guideline Review Documentation

The guideline review comments shall be documented on Attachment 1. The comments shall be entered in the following format. General comments which do not pertain to a specific location in the document shall be entered first. Specific comments shall then be entered sequentially as they occur in the document.

4.1.3.2 Guideline Review Evaluation Documentation

For each guideline review comment documented on Attachment 1, and evaluation of each comment shall also be documented on Attachment 1.

4.1.3.3 Verification Documentation

The verification shall be documented on Attachment 2. Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED <u>DATE</u> _____	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM _____	Long term effort required for resolution. Assign sequentially. (see 4.1.3.4)

Each verification shall be assigned an identifier per the following format:

WWWX-YY-ZZ

Where: WWW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequential)

4.1.3.4 Documentation of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit for review a program for resolution of the Category 3 (see 4.1.3.3) comments to the System Engineer, Reactor Safety. A "List of Outstanding Concerns" shall be maintained for each nuclear station. This list shall reference the originating document. The System Engineer, Reactor Safety, shall approve a plan for resolution of the outstanding concern. The Lead Safety Analysis Engineer shall undertake to resolve the concern and delete it from the list.

4.2 Long Term Verification

4.2.1 Objective

The objective of the long term verification of the vendor guidelines is to maintain the validity of the initial verification by performing technical verification of revisions or updates to the vendor guidelines for revisions issued by the vendor.

4.2.2 Method

Revisions to the vendor guidelines issued by the vendor shall be documented per 4.2.3.1 upon receipt from the vendor. The revision shall be promptly assessed to determine if any changes in technical content significantly impact the existing guidelines and consequently the emergency procedures. If a significant impact is identified, then the Lead Safety Analysis Engineer shall notify the System Engineer, Reactor Safety. The System Engineer, Reactor Safety, shall approve a plan for timely resolution and revision of the emergency procedures. The Lead Safety Analysis Engineer shall undertake technical verification of the vendor guideline revisions per 4.2.3.2. The Lead Safety Analysis Engineer shall promptly notify the appropriate station contact of the scope of the vendor revisions and the schedule for the plant specific guideline revision.

4.2.3 Documentation

4.2.3.1 Guideline Revision Evaluation Documentation

On receipt from the vendor of a revision to the vendor guidelines, the revision shall be documented on Attachment 3. Each revision shall be assigned an identifier per the following format:

WWWX-YY-ZZZ

Where: WWW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = calender year
ZZZ = sequentially assigned number
for all guideline and EP revisions

4.2.3.2 Verification Documentation

The verification shall be documented on Attachment 2. Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED ___ DATE _____	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM _____	Long term effort required for resolution. Assign sequentially. (see 4.1.3.4)

Each verification shall be assigned an identifier per the following format:

WWWX-YY-ZZ

Where: WWW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequential)

4.2.3.4 Documentation of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit for review a program for resolution of the Category 3 (see 4.2.3.2) comments to the System Engineer, Reactor Safety. A "List of Outstanding Concerns" shall be maintained for each nuclear station. This list shall reference the originating document. The System Engineer, Reactor Safety, shall approve a plan for resolution of the outstanding concern. The Lead Safety Analysis Engineer shall undertake to resolve the concern and delete it from the list.

4.3 Control of the Document

The NSSS vendor guidelines and the revisions to the guidelines issued by the vendor shall not receive controlled document status. The plant specific guidelines shall be based on the vendor guidelines and verified to be consistent with the vendor guidelines where applicable. The plant specific guidelines shall receive controlled document status. Revisions to the NSSS vendor guidelines issued by the vendor shall be included as revisions to the plant specific guidelines where applicable, and the revised guidelines verified. The Lead Safety Analysis Engineer shall undertake measures to maintain cognizance of all vendor issued documentation related to the vendor guidelines.

5.0 TECHNICAL VERIFICATION OF PLANT SPECIFIC GUIDELINES

Plant specific emergency procedure guidelines are the reference documents used by the emergency procedure author for the development of emergency procedures and subsequent revisions. Plant specific guidelines provide the technical basis for the emergency procedures. The NSSS vendor guidelines are typically applicable to a generic plant. The plant specific guidelines are based on the generic vendor guidelines, but may include guidelines which have been developed apart from the NSSS vendor which improve and optimize the vendor guidelines. The plant specific guidelines reflect the operating experience acquired from industry experience and improvements in the understanding of plant response and techniques for mitigation of plant transients.

5.1 Initial Verification

5.1.1 Objective

The objective of the initial verification of the plant specific guidelines is to determine that the guidelines provide correct and achievable methods for mitigation of plant transients, and to ensure that the conversion of the generic NSSS vendor guidelines to plant specific design specifications is technically correct. The results of the verification of the vendor guidelines shall be incorporated into the plant specific guidelines.

5.1.2 Method

5.1.2.1 Verifier Qualifications

The Lead Safety Analysis Engineer shall determine that the verifier is qualified to perform the technical verification of plant specific guidelines.

5.1.2.2 Control of the Document

The version of the document undergoing verification shall be controlled and uniquely specified. Revisions and updates to the document require subsequent verification.

5.1.2.3 Verification

The verifier shall initiate verification documentation per 5.1.3.1. The results of the verification of the corresponding vendor guideline as documented in the latest revision to the Technical Verification Certificate, shall be addressed in the plant specific guidelines, or shall be included as outstanding items in the Technical Verification Certificate, Revision 0, of the plant specific guideline. Additional technical concerns identified during the verification of the plant specific guideline which are also applicable to the vendor guideline shall be documented per 5.1.3.1, but are not required to be documented in the vendor guideline documentation per 4.1.3.3. The document is verified when the following conditions are met:

1. Technical content and accuracy.
2. Consistent with applicable vendor guidelines.
3. Consistent with FSAR licensing basis.
4. Based on sound operating principles and engineering judgment.

The document is verified when each evaluation item is addressed and resolved, or a program to provide resolution is documented. Evaluations which require a program to provide resolution must include documentation which justifies the acceptability of long term resolution. This documentation shall support the conclusion that no safety concern exists.

5.1.3 Documentation

5.1.3.1 Verification Documentation

The verification shall be documented on Attachment 2. Each verification shall be assigned an identifier per the following format:

WWWX-YY-ZZ

Where: WWW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequential)

Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED <u>DATE</u>	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM <u></u>	Long term effort required for resolution. Assign sequentially. (see 5.1.3.2)

5.1.3.2 Documentation of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit for review a program for resolution of the Category 3 (see 5.1.3.1) comments to the system Engineer, Reactor Safety. A "List of Outstanding Concerns" shall be maintained for each nuclear station. This list shall reference the originating document. The System Engineer, Reactor Safety, shall approve a plan for resolution of the outstanding concern. The Lead Safety Analysis Engineer shall undertake to resolve the concern and delete it from the list.

5.2 Long Term Verification

5.2.1 Objective

The objective of the long term verification of the plant specific guidelines is to maintain the validity of the initial verification by performing technical verification of revisions or updates to the plant specific guidelines.

Revisions or updates to the plant specific guidelines are expected to occur as a result of vendor initiated guideline revisions, inhouse optimization of emergency procedures, regulatory requirements, station modifications, and feedback from industry operating experience.

5.2.2 Method

Potential revisions to the plant specific guidelines shall be documented per 5.2.3.1 upon receipt from any source. The revision shall be promptly assessed to determine if any changes in technical content significantly impact the existing guidelines and consequently the emergency procedures. If a significant impact is identified, then the Lead Safety Analysis Engineer shall notify the System Engineer, Reactor Safety. The System Engineer, Reactor Safety, shall approve a plan for timely resolution and revision of the emergency procedures. The Lead Safety Analysis Engineer shall undertake technical verification of the plant specific guideline revisions per 5.2.3.2. The Lead Safety Analysis Engineer shall promptly notify the appropriate station contact of the scope of the guideline revisions and the schedule for the completion of the guideline revisions.

5.2.3 Documentation

5.2.3.1 Guideline Revision Evaluation Documentation

On receipt from any source of a potential revision to the plant specific guidelines, an evaluation of the potential revision shall be documented on Attachment 3. Each revision shall be assigned an identifier per the following format:

WWX-YY-ZZZ

Where: WW = nuclear station (ONS, MNS, CNS)
X = applicable unit (1, 2, 3, A(all))
YY = calendar year
ZZZ = sequentially assigned number
for all guideline and EP revisions

5.2.3.2 Verification Documentation

The verification shall be documented on Attachment 2. Each verification shall be assigned an identifier per the following format:

WWX-YY-ZZ

Where: WW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequential)

Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED <u>DATE</u> _____	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM _____	Long term effort required for resolution. Assign sequentially. (see 5.2.3.3)

5.2.3.3 Documentation of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit for review a program for resolution of the Category 3 (see 5.2.3.2) comments to the System Engineer, Reactor Safety. A "List of Outstanding Concerns" shall be maintained for each nuclear station. This list shall reference the originating document. The System Engineer, Reactor Safety, shall approve a plan for resolution of the outstanding concern. The Lead Safety Analysis Engineer shall undertake to resolve the concern and delete it from the list.

5.3 Control of the Document

The plant specific guidelines shall be developed into a formally controlled document. "Emergency Procedure Guidelines" (EPG) shall be maintained by the Lead Safety Analysis Engineer for each nuclear station. The Lead Safety Analysis Engineer shall determine and control the distribution of the EPG's and be responsible for distribution of EPG revisions. Each individual on the EPG distribution list shall acknowledge receipt and implementation of revisions, and the Lead Safety Analysis Engineer shall record and maintain a record of acknowledgments.

6.0 TECHNICAL VERIFICATION OF EMERGENCY PROCEDURES

Nuclear station emergency procedures are developed by the station staff. The station staff is responsible for maintaining consistency with the plant specific guidelines. Technical verification of the emergency procedures and revisions is undertaken to provide an independent review for technical consistency with the guidelines.

6.1 Initial Verification

6.1.1 Objective

The objective of the initial verification of the emergency procedures is to determine that the procedures correctly interpret the technical content of the plant specific guidelines.

6.1.2 Method

6.1.2.1 Verifier Qualifications

The Lead Safety Analysis Engineer shall determine that the verifier is qualified to perform the technical verification of emergency procedures.

6.1.2.2 Control of Document

The version of the document undergoing verification shall be controlled and uniquely specified. Revisions and updates to the document require subsequent verification.

6.1.2.3 Verification

The verifier shall initiate verification documentation per 6.1.3.1. The document is verified when the following conditions are met:

1. Technical content and accuracy.
2. Consistent with applicable plant specific guidelines.
3. Consistent with FSAR licensing basis.
4. Based on sound operating principles and engineering judgment.
5. The applicable plant specific guideline verification is completed.

6.1.3 Documentation

6.1.3.1 Verification Documentation

The verification shall be documented on Attachment 2. Each verification shall be assigned an identifier per the following format:

WWWX-YY-ZZ

Where: WWW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequential)

Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED ___ DATE _____	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM _____	Long term effort required for resolution. Assign sequentially. (see 6.1.3.2)

6.1.3.2 Resolution of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit to the System Engineer, Reactor Safety, a description of any significant outstanding concerns which prevent prompt resolution and completion of the verification. The Safety Engineer, Reactor Safety, shall contribute to the resolution of the outstanding concern by contacting the appropriate management level at the impacted nuclear station.

6.2 Long Term Verification

6.2.1 Objective

The objective of the long term verification of the emergency procedures is to maintain the validity of the initial verification by performing technical verification of revisions or updates to the emergency procedures, and to facilitate expeditious implementation of revised procedures, as necessary.

6.2.2 Method

Proposed revisions to the emergency procedures shall be documented per 6.2.3.1 upon receipt from any source. The Lead Safety Analysis Engineer shall undertake technical verification of the emergency procedure revisions per 6.2.3.2. The Lead Safety Analysis Engineer shall promptly notify the appropriate station contact of the schedule for the completion of the technical verification. In the event of a situation warranting an expedited technical verification, the transmittal of the emergency procedure revision and the results of the technical verification shall be transmitted orally by phone with full documentation initiated shortly thereafter and completed per 6.2.3.2.

6.2.3 Documentation

6.2.3.1 Emergency Procedure Revision Evaluation Documentation

On receipt from any source of a proposed revision to an emergency procedure, an evaluation of the proposed revision shall be documented on Attachment 3. Each revision shall be assigned an identifier per the following format:

WWX-YY-ZZZ

Where: WW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = calendar year
ZZZ = sequentially assigned number
for all guideline and EP revisions

6.2.3.2 Verification Documentation

The verification shall be documented on Attachment 2. Each verification shall be assigned an identifier per the following format:

WWX-YY-ZZ

Where: WW = nuclear station (ONS,MNS,CNS)
X = applicable unit (1,2,3,A(all))
YY = document number (sequential)
ZZ = revision number (sequentially)

Each evaluation shall be stamped and classified into one of the three following categories:

<u>Category</u>	<u>Response</u>
1. NO RESOLUTION REQUIRED	No response necessary.
2. RESOLVED ___ DATE ___	Short term resolution to be initiated. To be initialed and dated upon completion.
3. LONG TERM ITEM _____	Long term effort required for resolution. Assign sequentially. (see 6.2.3.3)

6.2.3.3 Resolution of Outstanding Concerns

The Lead Safety Analysis Engineer shall submit to the System Engineer, Reactor Safety, a description of any significant outstanding concerns which prevent prompt resolution and completion of the verification. The System Engineer, Reactor Safety, shall contribute to the resolution of the outstanding concern by contacting the appropriate management level at the impacted nuclear station.

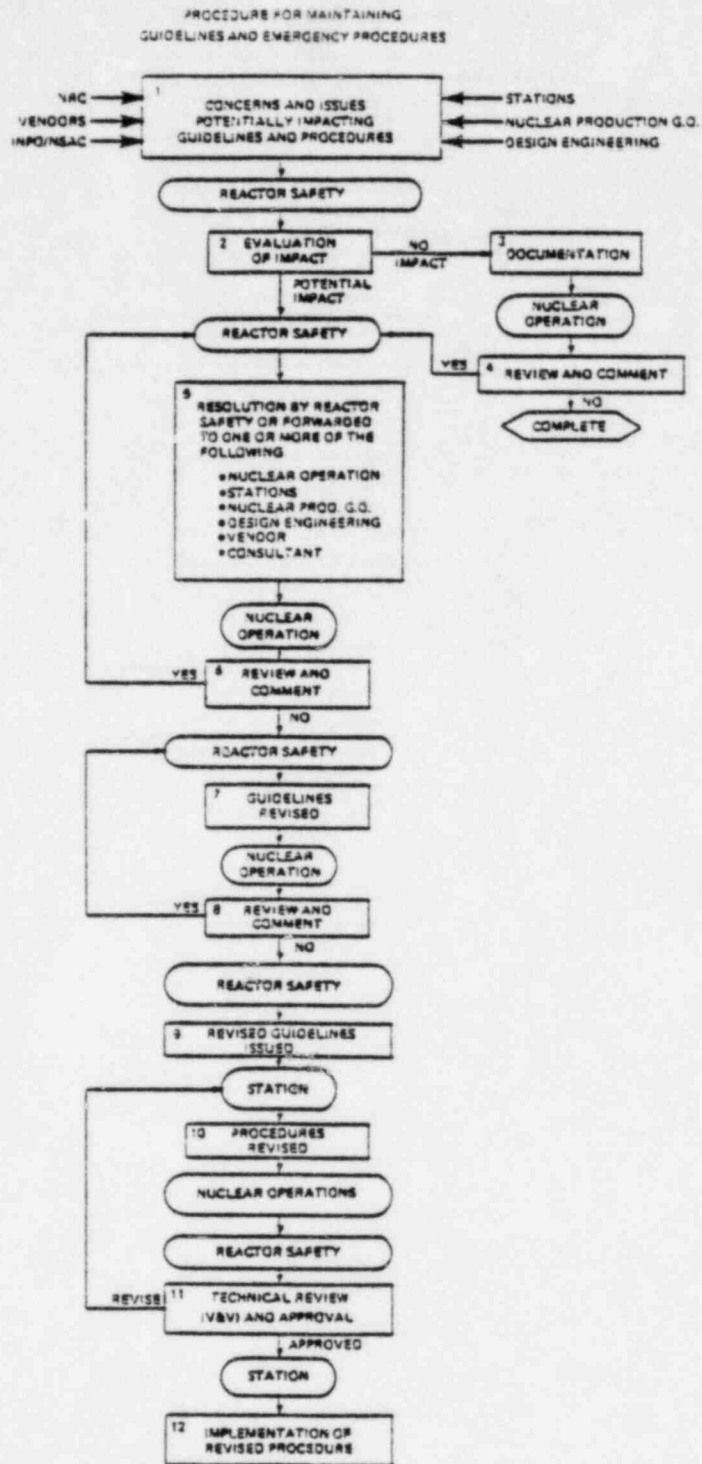
6.3 Control of the Document

The emergency procedures are under control of the nuclear stations. The Superintendent of Operations is responsible for assuring that the technical verification is completed prior to implementing an emergency procedure revision.

7.0 INTERFACES

The technical verification of the plant specific guidelines and the emergency procedures requires maintaining a number of interfaces at many steps in the verification process. These interfaces are shown in the attached Figure 1.

Figure 1



DUKE POWER COMPANY
NUCLEAR PRODUCTION DEPARTMENT

TECHNICAL DOCUMENT REVIEW

PAGES _____

DOCUMENT _____

_____ DATED _____

REVIEWED BY _____ DATE _____

TITLE _____

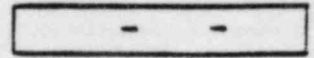
APPROVED BY _____ DATE _____

TITLE _____

ITEM	REVIEW COMMENTS	RESOLUTION

ITEM	REVIEW COMMENTS	RESOLUTION

DUKE POWER COMPANY
NUCLEAR PRODUCTION DEPARTMENT



NUCLEAR STATION
EMERGENCY PROCEDURE/GUIDELINE
TECHNICAL VERIFICATION CERTIFICATE

STATION _____ UNIT _____

DOCUMENT _____

DATED _____STATEMENT OF CERTIFICATION

THIS DOCUMENT HAS BEEN VERIFIED IN ACCORDANCE WITH REACTOR SAFETY PROCEDURE RS -003.
" TECHNICAL VERIFICATION OF NUCLEAR STATION EMERGENCY PROCEDURES AND GUIDELINES."
AND MEETS ALL APPLICABLE CRITERIA AS FOLLOWS:

YES NO N/A

—	—	—	Technical content and accuracy.
—	—	—	Consistent with applicable vendor guidelines.
—	—	—	Consistent with applicable plant specific guidelines.
—	—	—	Consistent with FSAR licensing basis.
—	—	—	Based on sound operating principles and engineering judgement.



THIS DOCUMENT DOES NOT MEET THE CRITERIA REQUIRED FOR CERTIFICATION. THE ITEMS ON THE
FOLLOWING PAGES REQUIRE FURTHER REVISION OR JUSTIFICATION.

VERIFIED BY _____ DATE _____

TITLE _____ ORGANIZATION _____

REVIEWED BY _____ DATE _____

TITLE _____ ORGANIZATION _____

NUCLEAR STATION

EMERGENCY PROCEDURE/GUIDELINE
TECHNICAL VERIFICATION CERTIFICATE

Page _____ of _____

STATION _____ UNIT _____

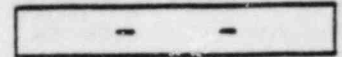
DOCUMENT _____

_____ DATED _____

THE FOLLOWING ITEMS REQUIRE FURTHER REVISION OR JUSTIFICATION:

RESPONSE: BY _____ DATE _____

DUKE POWER COMPANY
NUCLEAR PRODUCTION DEPARTMENT



NUCLEAR STATION
EMERGENCY PROCEDURE/GUIDELINE
REVISION EVALUATION

Attachment 3

STATION _____ DOCUMENT _____
SUBMITTED BY _____
DATE _____ TITLE _____
ORGANIZATION _____

DESCRIPTION OF REVISION

OTHER AFFECTED DOCUMENTS

EVALUATION

RESPONSE TAKEN

EVALUATED BY _____ DATE _____
TITLE _____ ORGANIZATION _____
APPROVED BY _____ DATE _____
TITLE _____ ORGANIZATION _____