Public Service™ FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO

TITLE: GUIDELINES FOR PREPARATION OF EMERGENCY PROCEDURES

ISSUANCE AUTHORIZED BY			
PORC REVIEW			EFFECTIVE DATE

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1.0 OBJECTIVE

*#*See Commitment 7.1*#* This document provides specific administrative and technical guidelines for preparing Fort St. Vrain Emergency Procedures.

2.0 SCOPE

This procedure applies to the development and revision of all Emergency Procedures, including those dealing with specific emergency events and those dealing with the monitoring, maintenance, and restoration of critical safety functions.

3.0 GUIDELINES FOR PROCEDURE PREPARATION

The Emergency Procedures should be concise, but adequately detailed to ensure that the Control Room Operators are provided with unambiguous guidance for emergency plant operation.

3.1 PROCEDURE REVISIONS

Revisions to this Writer's Guide and to the Emergency Procedures shall be reviewed and approved in accordance with the Fort St. Vrain Administrative Procedure G-2 requirements for Level III, Emergency Procedures.

3.2 GENERAL WRITING GUIDELINES

3.2.1 Each procedure step should deal with only one idea.

3.2.2 Complex evolutions should be prefaced by a short general requirement and then described, as simply as practical, on a step-by-step basis.

3.2.3 Non-sequential step sequence should be stated.

3.2.4 Each action step should be presented as a command composed of one or two complete sentences.

3.2.5 As a guide, sentence length should not exceed 20 words. Long complex sentences are less effective in communicating the intent of the procedure.

3.2.6 Objects of Operator actions should be specifically stated.

3.2.7 The basis, or reason, for an action should not be included in the procedure.

3.2.8 Limits and values should be expressed quantitatively. Tolerances should be expressed by indicating the entire range (e.g., use 10" to 20" rather than 15" ± 5").

3.2.9 Human engineering and ALARA factors, such as sequence of operation, reduced memorization, no mental calculations, and early action to prevent radioactive release from the plant site, should be incorporated into Emergency Procedures.

3.2.10 When actions are required based on activation of an annunciator, the setpoint of the alarm should be listed to facilitate verification.

3.2.11 When resetting an automatic function, the expected plant changes as a result of the resetting action, should be listed.

3.2.12 A note should be provided to notify the Operator prior to the performance of any step that will activate an annunciator.

3.2.13 When additional confirmation of system response is considered necessary, the additional indications to be observed, should be listed.

3.2.14 Describe the system response time associated with performance of a step, or series of steps, when it is considered important to the Operator for proper understanding and performance.

3.2.15 The Operator should not be referred to any other document, reference, or procedure for actions required to mitigate the challenge to a Critical Safety Function, <u>except</u> another emergency procedure.

3.2.16 Expected results of routine tasks or evolutions need not be stated.

3.2.17 Do not split procedure steps between pages.

3.3 <u>LEVEL OF DETAIL</u>

3.3.1 Emergency procedures shall consist of a series of steps and substeps. The steps shall be written in the form of a command that tells the operator what to do (e.g., start one circulator using the emergency condensate system as motive power). The substeps should then tell the Operator, in more detail, <u>how</u> to accomplish the step.

3.3.2 Each step should be written in the degree of detail to allow a qualified Operator to understand what must be done to complete the step.

3.3.3 Each substep should be written in enough detail to specify to a qualified Operator exactly which controls and displays should be used to complete the substep.

3.3.4 Each substep should contain enough detail so that reliance on the Operators' memory is kept to a practical minimum.

3.4 PUNCTUATION

Punctuation should be used only as necessary to aid reading and prevent misunderstanding. Word order should be selected to minimize punctuation. If extensive punctuation is necessary for clarity, the sentence should be rewritten or made into several sentences. Punctuation should be in accordance with the following rules and Fort St. Vrain Administrative Procedure G-2.

3.4.1 Use a colon to introduce a list of items.

3.4.2 Limit the number of commas to ensure that the procedure is not too complex or awkwardly constructed.

3.4.3 Use a period at the end of a sentence and to indicate decimal places.

3.4.4 Use brackets to indicate options in equipment lineup (e.g., Start one nitrogen compressor C-2109[C-2109S] with HS-21431[HS-21432]). Brackets are not to be used when the Operator is to operate all of the designated components. The procedure should be written so that once an option is selected, it is followed clearly and consistently throughout that section of the procedure (e.g., Coolers E-5109X[E-5109SX]).

3.4.5 Use parentheses to set off referenced figures, tables, appendices, etc.

3.5 VOCABULARY

Words used in procedures should convey precise meaning to qualified individuals. The following rules should apply:

3.5.1 Use short, common words of few syllables.

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3.5.2 Use non-technical, common usage if it makes the procedure easier to understand.

3.5.3 Minimize the use of "a", "an", and "the" unless they are needed for clarity.

3.5.4 Avoid specialized or abstract words when synonyms are available.

3.5.5 Use action verbs in instructional steps to denote a particular action that the Operator must perform.

3.5.6 Common action verbs and their applications are provided in Appendix 1 as a guide.

3.6 NUMERICAL VALUES

The use of numerical values should be consistent with the following rules:

3.6.1 Arabic numerals should be used.

3.6.2 For numbers between zero and one, the decimal point should be preceded by a zero (e.g., 0.1).

3.6.3 For numbers less than zero, a minus sign should precede the number (e.g., -0.1).

3.6.4 The operator should not be required to read an indicator to greater precision than is displayed by the indicator.

3.6.5 Engineering units should always be specified for numerical values of process variables and should be the same as those used on the panel displays (e.g., psig instead of psi).

3.6.6 Units of measure should be given numerical values that represent observed or measured data and calculated results. A virgule (/) should be used instead of "per" (e.g., ft/sec, micromho/cm, and lbs/hr).

3.6.7 Scientific notation values should be indicated by the capital "E" followed by a plus (+) or minus (-) (to indicate sense) and the value (e.g., 3.2 E+12, 1.7 E-06).

3.7 COMPONENT IDENTIFICATION

3.7.1 For steps, components should be identified by their piping and instrumentation (P&I) component identification number and common name [e.g., Start Buffer Helium Recirculator (C-2105)]. For substeps, equipment and controls should be identified by the handswitch number, P&I component identification number, panel number on which the control switch (or display) is located, and the placard description as provided on the panel. For the above example, the single substep might read "Place HS-2193 (C-2105 Buffer Helium Recirculator) on Panel I-02 to the START position and release."

3.7.2 Annunciators should be identified by quoting the annunciator window verbatim followed by the panel number and grid coordinates of the window enclosed in parentheses [e.g., SERVICE WATER COOL TOWER FAN TRIP (I-06G, 1-7)].

3.7.3 When referencing specific engraved names and numbers on panel placards and annunciator windows, the engraving should be quoted verbatim and emphasized by using all capitals [e.g., verify that SERVICE WATER COOL TOWER FAN 1A VIB HIGH (I-06G, 2-7) annunciator is reset].

3.8 CALCULATIONS

Calculations should not be required to perform steps or substeps in emergency procedures. Retrieving a value from a chart or graph is permissible, but requirements to do so should be kept to an absolute, practical minimum.

3.9 ABBREVIATIONS AND ACRONYMS

Except when identifying controls and displays in substeps, abbreviations and acronyms should not be used.

3.10 GENERAL FORMAT

3.10.1 EMEGENCY PROCEDURE DESIGNATION AND NUMBERING

There are three types of emergency procedures:

a) Event-oriented emergency procedures

b) Symptom-oriented diagnostic and critical safety function monitoring procedures

c) Symptom-oriented critical safety function restoration procedures

Each emergency procedure shall be assigned a designation that consists of the prefix "EP" followed by one of the following:

a) The system number for event-oriented procedures - the number will correspond to the system in which the initiating event occurs.

b) The number 0, (zero) for the diagnostic and critical safety function monitoring procedure

c) The letter designator for the appropriate critical safety function for symptom-oriented critical safety function restoration procedures.

The letter designator for each critical safety function are listed below:

R-Reactivity
C-Containment
I-Primary coolant system integrity
P-Primary heat transfer
S-Secondary heat transfer

3.10.2 APPROVAL AND REVISIONS

See Section 3.1 of this procedure.

3.10.3 APPENDICES

The use of appendices and attachments shall be minimized in emergency procedures.

3.10.4 TWO-COLUMN FORMAT

The body of emergency procedures shall contain two columns of steps and substeps. The left-hand column shall contain the steps and substeps that Operators should complete assuming the outcome of the previous step is as expected, i.e., successful.

The right-hand column shall contain the steps and substeps the Operators should take if the step(s) in the adjacent column are not successful or for any reason cannot be completed.

The intent of this format is to never leave the Operator without specific guidance as to what actions need to be taken.

3.11 CAUTIONS AND NOTES

3.11.1 Do not use WARNING statements in emergency procedures.

3.11.2 CAUTIONS and NOTES are to be used in emergency procedures.

3.11.3 See Administrative Procedure G-2 for CAUTION and NOTE formats.

3.11.4 Unless a CAUTION or NOTE applies to both columns in an emergency procedure, it shall be confined to one or the other column.

4.0 EMERGENCY PROCEDURE ORGANIZATION

4.1 DESCRIPTION OF EMERGENCY PROCEDURES SECTIONS

Each emergency procedure shall consist of the following sections:

1.0 OBJECTIVE
2.0 SCOPE
3.0 ENTRY CONDITIONS
4.0 PRECAUTIONS AND LIMITATIONS
5.0 BODY OF PROCEDURE
6.0 COMMITMENTS

Each section is briefly described below.

4.1.1 OBJECTIVE (Section 1.0)

The Objective is a brief statement describing the purpose of the procedure.

For event-based procedures, the objective section will consist of the following statement: "To provide detailed instructions to the plant operating personnel for dealing with a specific plant transient having a known single cause."

For the symptom-based diagnostic procedure, the objective section will consist of the following statement: "To provide detailed instructions to the plant operating personnel for identifying the cause of plant transients."

4.2.2 Caution statements shall not be used in lieu of instructional steps. Rather, a caution is intended to highlight a potential hazard to equipment or personnel associated with a particular step.

4.2.3 A NOTE is used to present or remind the operator of additional information that is "nice to know" or may aid in helping the operator understand the purpose of an instruction.

4.2.4 A NOTE should present information only (no instructions). NOTES are placed immediately preceding, and on the same page as, the step to which it applies.

5.0 REFERENCES

5.1 Administrative Procedure G-2, "FSV PROCEDURE SYSTEMS", Fort St. Vrain Nuclear Generating Station, Issue 18, 7-Aug-85.

5.2 Updated Final Safety Analysis Report, Fort St. Vrain Nuclear Generating Station.

5.3 INPO 82-016, "Emergency Operating Procedures Implementation Guideline", June, 1982.

5.4 INPO 82-017, "Emergency Operating Procedures Writing Guideline", July, 1982.

5.5 NUREG-0737, Supplement 1, "Clarification of TMI Action Plan Requirements".

5.6 NUREG-0899, "Guidelines for the Preparation of Emergency Operating Procedures."

5.7 NRC Staff Recommendations on the Requirements for Emergency Response Capability, March, 1982.

6.0 APPENDIX

Appendix 1, List of Action Verbs

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7.0 COMMITMENTS

The step(s) and section(s) listed below may not be deleted without issuance of comparable controls. The procedure itself, if initiated as a result of commitment corrective action, may not be deleted without issuance of comparable controls.

7.1 This Writer's Guide is part of the overall Fort St. Vrain Procedures Generation Package which is a commitment made in response to NUREG-0737, Supplement 1.

APPENDIX 1

LIST OF ACTION VERBS

Word	Application
Activate	Formally institute special activity/function. To place into operation.
Align	Place systems or componenets (e.g., valve and breakers) in proper positions for accomplishing specified function.
Allow	To permit a stated condition to be achieved prior to proceeding (e.g., "allow discharge pressure to stabilize").
Check	To determine the present status of a plant parameter or component.
Close	Mechanically: To change the physical position of a mechanical device so that it prevents physical access or fluid flow. Electrically: To change the physical position of an electrical circuit breaker to permit passage of electrical current.
Complete	To accomplish specified procedural requirements (e.g., "complete valve checklist A," "complete data report QA-," "complete Section 3.1 of SOP-46").
Comparison	A comparing or being compared.
Confirm	To observe an expected condition or characteristic without being specific as to the method (e.g., "confirm . . . pump operation").
Decrease	Use "lower" in lieu of "decrease" when possible.
De-energize	Use "Open" in lieu of "De-energize" when possible.
Depress	Refers to pushbutton operation.

APPENDIX 1

LIST OF ACTION VERBS

Word	Application
Discrepancy	Disagreement or inconsistency.
Energize	Use "Close" in lieu of "Energize" when possible.
Ensure	Take necessary/appropriate actions to guarantee component, reading, etc., as specified.
Establish	To make arrangements for a stated condition (e.g., "establish communication with control room").
Execute	To do or perform the instructed action or steps.
Implement	Commence a required program or series of procedures.
Increase	Use "raise" in lieu of "increase" when possible.
Initiate	Take actions to begin a process.
Inspect	To measure, observe or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included (e.g., "visually inspect for leaks").
Isolate	Remove from service by closing off the flow path.
Local	Take action outside the control room at equipment or local operating station.
Limitation	Specific parameter not to be exceeded (violated).
Maintain	Take appropriate actions to prevent fluctuation/changing.
Manual Initiation	Operator action which activates a function which is normally initiated automatically due to plant conditions.
Manual Trip	Operator action to activate a Reactor Trip or stop an operating piece of equipment such as a pump.

APPENDIX 1

LIST OF ACTION VERBS

Word	Application
May	Possibility, permission or contingency.
Monitor	To observe a stated parameter or function for significant changes. This does not mean an operator continuously watches the parameter, but is aware of any changes necessary to keep the operation under control.
Notify	Inform specified personnel.
Open	Mechanically: To change the physical position of a mechanical device, such as a valve, or door to unobstructed position that permits a fluid flow or access. Electrically: To change the physical position of an electrical circuit breaker to prevent passage of electrical current.
Per	As specified in or by named procedure. Implies referencing the document is optional.
Place	Physically position a switch to the specified location.
Proceed	Go to specified area. In case of procedures, follow directions given.
Qualified	All station personnel who by virtue of training and experience are capable of completing assigned tasks safely and effeciently.
Rack In	Place an electrical circuit breaker in place by physically connecting it to its associated power source.
Rack Out	Disconnect an electrical circuit breaker by physically removing it from its associated electrical cubicle.

APPENDIX 1

LIST OF ACTION VERBS

Word	Application
Record	To document specified condition or characteristic (e.g., "record discharge pressure").
Refer	Use as a supplement. Perform applicable actions of cited procedure and return to the controlling procedure.
Regulate	Control or restrict.
Restore and Maintain	To bring a specified parameter back under control or within specified limits and keep it within those limits.
Rotate	Turn a rotary multi-position switch to the required position. In reference to pumps, hand rotate before energizing.
Secure	Remove from service. Take appropriate action to prevent return to service.
Set	To physically adjust to a specified value an adjustable feature (e.g., "set diesel speed to . . . rpm").
Shall	Implies mandatory requirement.
Shift	Specifies changing mode of operation.
Should	Implies nonmandatory, preferred, or desired method.
Shut	Use "close" in lieu of "shut" when possible.
Stabilize	To bring a specified parameter under control with any fluctuations controlled.
Start	To orginate motion of an electric or mechanical device directly or by remote control (e.g., "start . . . pump").
Stop	To terminate operation (e.g., "stop . . . pump").

APPENDIX 1

LIST OF ACTION VERBS

Word	Application
Terminate Injection	To stop flow to a specified location. This allows redirecting flow to another location without tripping the pump.
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate (e.g., "throttle valve V-46964 to . . .").
Trip	Do not use except when the circuit breaker opens automatically. Use "open" in lieu of "trip" when possible.
Vent	To permit a gas or liquid confined under pressure to escape at a vent (e.g., "vent . . . pump").
Verify	To determine if in proper condition/status and place in proper condition/status if not found in proper condition/status.

To standardize those applications in which specific terminology should be used, the following guidelines apply:

Application	Terminology
Power Driven Equipment	START/STOP
Valves	OPEN/THROTTLE/CLOSE
Control Switches	NORMAL (AFTER START)
	NORMAL (AFTER STOP)
Indicating Lights	ON/OFF
Annunciators	ACTIVATE/RESET
Circuit Breakers or Switches	CLOSE (ON)/OPEN (OFF)
Plant Parameters	RAISE/LOWER