ATTACHMENT TO AEP:NRC:0773Q

PROCEDURES GENERATION PACKAGE

PART I

SPECIFIC TECHNICAL GUIDELINES

FOR

DONALD C. COOK NUCLEAR PLANT

REVISION 1

MAY 1, 1986

D. C. COOK PLANT SPECIFIC TECHNICAL GUIDELINES

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D. C. COOK PLANT SPECIFIC TECHNICAL GUIDELINES

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(Revisions made to the original document are indicated by margin bars.)

1. INTRODUCTION

The development of plant-specific technical guidelines is one of the four elements of the Procedures Generation Package, which is required by NUREG-0899 and Supplement 1 to NUREG-0737. For the D. C. Cook Nuclear Plant Unit 1, the generic Westinghouse Emergency Response Guidelines (ERGs), Revision 1 will be used as the basis for writing the plant specific Emergency Operating Procedures (EOPs).

This document describes the method of developing plant specific EOPs from the generic Westinghouse ERGs for the D. C. Cook Nuclear Plant Unit 1. Also, plant specific information for the D. C. Cook plant, which highlights differences from the generic Westinghouse ERGs, is included in this document.

2. COMPARISON OF SYSTEM DESIGNS

During the development of the generic Westinghouse Emergency Response Guidelines (ERGs), a generic reference plant design configuration was assumed, and the technical content included in the ERGs is based upon the reference plant design. The following systems are included in the reference plant:

- Reactor Trip Actuation System
- ESF Actuation System
- Nuclear Instrumentation System
- Control Rod Instrumentation System
- Containment Instrumentation System
- Reactor Coolant System
- Chemical & Volume Control System
- Safety Injection System
- Residual Heat Removal System
- Radiation Monitoring System
- Containment Spray System
- Containment Atmosphere Control System
- Component Cooling Water System
- Service Water System
- Main Feedwater and Condensate System
- Main Steam System
- Auxiliary Feedwater System
- Steam Generator Blowdown System
- Sampling System
- Spent Fuel Storage and Cooling System
- Control Rod Drive Mechanism Cooling System
- Control Rod Control System
- Turbine Control System
- Electric Power System
- Pneumatic Power System

2. COMPARISON OF SYSTEM DESIGNS (Cont.)

To aid in the development of the plant specific EOPs for the D. C. Cook plant, a comparison of the above systems from an emergency operations perspective for the D. C. Cook and reference plant will be made. This comparison will be done in a systematic and complete manner by reviewing all of the above systems. The purpose of the comparison is to identify areas of the D. C. Cook plant which are different from the reference plant from the standpoint of emergency system operations, and thus these areas will be explicitly considered and included as appropriate during the development of the D. C. Cook EOPs. The comparison for each system follows. Appendix A was developed to provide a detailed comparison of each system based upon its use in the ERGs. Appendix B provides a more detailed component level comparison relative to the Revision 1 reference plant. Appendices A and B should be referred to during the following comparison of each system.

REACTOR TRIP ACTUATION SYSTEM

The function of the Reactor Trip Actuation System (RTAS) is to monitor specified process parameters and equipment status and to actuate reactor trip if conditions exceed specified limits. From the standpoint of emergency operations, the RTAS is the same for the D. C. Cook and reference plant.

ESF ACTUATION SYSTEM

The function of the ESF Actuation System (ESFAS) is to monitor specified process parameters and to actuate engineered safety features (ESF) operation if conditions exceed specified limits. From the standpoint of emergency operations, the ESFAS is the same for the D. C: Cook and reference plant.

2. COMPARISON OF SYSTEM DESIGNS (Cont.)

NUCLEAR INSTRUMENTATION SYSTEM

The function of the Nuclear Instrumentation System (NIS) is to monitor and display the reactivity state of the reactor core. From the standpoint of emergency operations, the NIS is the same for the D. C. Cook and reference plant.

CONTROL ROD INSTRUMENTATION SYSTEM

The function of the Control Rod Instrumentation System (CRIS) is to monitor and display the position of the reactor core control rods. From the standpoint of emergency operations, the CRIS is the same for the D. C. Cook and reference plant.

CONTAINMENT INSTRUMENTATION SYSTEM

The function of the Containment Instrumentation System (CIS) is to monitor the environmental condition and isolation status of the containment. From the standpoint of emergency operations, the CIS is the same for the D. C. Cook and reference plant.

REACTOR COOLANT SYSTEM

The function of the Reactor Coolant System (RCS) is to transfer heat from the reactor core to the main steam system or residual heat removal system to provide a barrier against the release of reactor coolant or radioactive material to the containment environment. From the standpoint of emergency operations, the RCS is the same for the D. C. Cook and reference plant.

2. <u>COMPARISON OF SYSTEM DESIGNS</u> (Cont.)

CHEMICAL AND VOLUME CONTROL SYSTEM

The function of the Chemical and Volume Control System (CVCS) system is to provide coolant to the reactor coolant system and to provide reactivity control for normal operations and any event that does not require engineered safety features operation. From the standpoint of emergency operations, the CVCS is the same for the D. C. Cook and reference plant.

SAFETY INJECTION SYSTEM

The function of the Safety Injection System (SIS) is to provide coolant to the reactor coolant system and to introduce negative reactivity or restrict the addition of positive reactivity for events that require engineered safety features operation. From the standpoint of emergency operations, the SIS is the same for the D. C. Cook and reference plant except for Subsystem C as shown in Appendix A.

RESIDUAL HEAT REMOVAL SYSTEM

The function of the Residual Heat Removal System (RHRS) is to remove residual heat from the reactor coolant system during plant shutdown operations at low reactor coolant system pressures. From the standpoint of emergency operations, the RHRS is the same for the D. C. Cook and reference plant.

RADIATION MONITORING SYSTEM

The function of the Radiation Monitoring System (RMS) is to monitor the radiation levels in specified process systems and specified areas internal and external to the plant. From the standpoint of emergency operations, the RMS is the same for the D. C. Cook and reference plant.

2. COMPARISON OF SYSTEM DESIGNS (Cont.)

CONTAINMENT SPRAY SYSTEM

The function of the Containment Spray System (CSS) is to provide containment pressure suppression and airborne fission product removal for events that require engineered safety features actuation. The D. C. Cook design is different from the reference plant as shown in Appendix A and these differences should be incorporated during the writing of the EOPs.

CONTAINMENT ATMOSPHERE CONTROL SYSTEM

The function of the Containment Atmosphere Control System (CACS) is to provide containment heat removal and combustible gas mixture control. The D. C. Cook design is significantly different from the reference plant as shown in Appendix A and these differences should be incorporated during the writing of the EOPs.

COMPONENT COOLING WATER SYSTEM

The function of the Component Cooling Water System (CCWS) is to provide heat removal from system process and equipment via an intermediate closed-loop system. From the standpoint of emergency operations, the CCWS is the same for the D. C. Cook and reference plant.

SERVICE WATER SYSTEM

The function of the Service Water System (SWS) is to provide heat removal from system processes and equipment to the ultimate heat sink via an open-loop system. From the standpoint of emergency operations, the SWS is the same for the D. C. Cook and reference plant.

2. COMPARISON OF SYSTEM DESIGNS (Cont.)

MAIN FEEDWATER AND CONDENSATE SYSTEM

The function of the Main Feedwater and Condensate System (MFCS) is to provide water to the secondary side of the steam generators during plant power operations. From the standpoint of emergency operations, the MFCS is the same for the D. C. Cook and reference plant with the exception of the feedwater flow control bypass valves as shown by Appendix A.

AUXILIARY FEEDWATER SYSTEM

The function of the Auxiliary Feedwater System (AFS) is to provide coolant to the secondary side of the steam generators during plant shutdown operations and for events that require engineered safety features operations. From the standpoint of emergency operations, the AFS is the same for the D. C. Cook and reference plant.

MAIN STEAM SYSTEM

The function of the Main Steam System (MSS) is to provide controlled heat removal from the reactor coolant system via the steam generators. From the standpoint of emergency operations, the MSS is the same for the D. C. Cook and reference plant with the exception of the bypass valves as shown by the comparison given in Appendix A.

STEAM GENERATOR BLOWDOWN SYSTEM

The function of the Steam Generator Blowdown System (SGBS) is to provide letdown from the secondary side of the steam generators. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

2. COMPARISON OF SYSTEM DESIGNS (Cont.)

SAMPLING SYSTEM

The function of the Sampling System (SS) is to provide a means for sampling process systems. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

SPENT FUEL STORAGE AND COOLING SYSTEM

The function of the Spent Fuel Storage and Cooling System (SFSCS) is to control fuel storage positions to ensure a subcritical geometric configuration and to provide heat removal to maintain stored fuel within specified temperature limits. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

CONTROL ROD DRIVE MECHANISM COOLING SYSTEM

The function of the Control Rod Drive Mechanism Cooling System (CRDMCS) is to provide heat removal from the control rod drive mechanisms. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

CONTROL ROD CONTROL SYSTEM

The function of the Control Rod Control System (CRCS) is to control the position of the control rods in the reactor core. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

TURBINE CONTROL SYSTEM

The function of the Turbine Control System (TCS) is to control the turbine-generator. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

2. <u>COMPARISON OF SYSTEM DESIGNS</u> (Cont.)

ELECTRICAL POWER SYSTEM

The function of the Electrical Power System (EPS) is to provide ac and dc electrical power to equipment that require electrical power to accomplish their functions. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

PNEUMATIC POWER SYSTEM

The function of the Pneumatic Power System (PPS) is to supply pneumatic power (typically control air) to equipment that require pneumatic power to accomplish their functions. From the standpoint of emergency operations, the D. C. Cook design is the same as the reference plant.

3. DISCUSSION OF ANALYSIS

The D. C. Cook Plant design has been reviewed with respect to the reference plant analyses which were performed to support the development of the generic ERGs. This review has confirmed that the reference analyses are applicable to the D. C. Cook Plant and that no additional analysis is required to support the use of the ERGs in developing plant specific procedures for the D. C. Cook Plant. The reference plant for many of the analyses is a standard 4-loop non-UHI plant, but the analyses are intended to be generic and applicable to all Westinghouse-designed commercial PWR plants to the maximum extent practicable. Since the D. C. Cook Plant is similar to the reference plant, many of the analyses are directly applicable to D. C. Cook. Although the D. C. Cook Plant has an ice condenser containment system compared to the dry containment system for the reference plant, this difference does not affect the applicability of the analyses for D. C. Cook. At the same time, note that these ice condenser design features have been incorporated into the D. C. Cook EOPs. For those cases where the analysis is not directly applicable to the D. C. Cook Plant, a comparison of the system design and plant parameters demonstrates that the reference analyses are bounding for the D. C. Cook Plant, and that the conclusions are applicable to the D. C. Cook Plant.

(Analyses performed for a four loop reference plant were considered to be directly applicable to the DCCNP without any additional evaluation. References analyses performed for a three loop plant required an evaluation of system designs and plant parameters to demonstrate that the analysis results were bounding for DCCNP.)

4. BASIS FOR USING THE GENERIC WESTINGHOUSE ERGs

To the greatest practicable extent, the Westinghouse Emergency Response Guidelines (ERGs) have been constructed to be generic and applicable to all Westinghouse-designed commercial PWR plants. It can be seen from the comparison made in Section 2 that the D. C. Cook plant is very similar to the reference plant, which was used as the basis for developing the ERGs. Also, as noted in the analysis discussion provided in Section 3, the analysis performed to support the generic ERGs is also applicable to the D. C. Cook plant, and no additional analysis is required. Therefore, the D. C. Cook EOPs will be based upon the generic Westinghouse ERGs, HP-Revision 1. When writing the EOPs, modifications to ERG steps must be made to account for the D. C. Cook plant design differences which are delineated in Section 2.

5. METHOD FOR DEVELOPING EOPs FROM ERGs

5.1 General

The generic Westinghouse Emergency Response Guidelines (ERGs), Revision 1 will be used as the basis for writing the EOPs for the D. C. Cook Nuclear Plant Unit 1. A final list of the Revision 1 ERGs is included as Appendix B.

This section describes the method that will be used to convert the generic guidelines into EOPs.

5.2 Preparation

The EOP writing team will obtain and review the following source documents for D. C. Cook Unit 1:

- Westinghouse generic ERGs, Rev. 1 and background documents
- D. C. Cook Plant Specific Technical Guidelines
- D. C. Cook Writers Guide for EOPs
- Technical Specifications
- Setpoints
- Engineering Flow Diagrams
- System Descriptions
- Existing EOPs (See letter AEP-82-604, 12/14/82)
- Calculated Mathematical Values used in EOPs (included in Background Information Manual)

5.3 Method

The EOP writers will follow the ERGs step by step. The writer will research the source documents and then construct the EOP and an associated EOP Documentation Form (Appendix C). This D. C. Cook Background Documentation Form will list how each generic guideline step is used in the EOP and also list any additional steps added to the EOP with its basis, if applicable. Any difference between the

5.3 Method (Cont.)

ERG step and the D. C. Cook step will be explained. This form along with the calculation for mathematical values used in the EOPs will be kept in the Background Information Manual for the D. C. Cook EOPs.

The following additional instructions for writing the EOPs and completing the EOP Documentation Form are provided.

1. If the generic step is compatible with the D. C. Cook plant design, then the step should be copied into the D. C. Cook EOP. Since the technical basis for the step is explained in the ERG Background Document, there is no need to repeat this on the background documentation form.

2. When an ERG step specifies a numerical value to be calculated, the value will be determined and put into the D. C. Cook EOP. The documentation form should indicate where the method of derivation is located.

3. When an ERG step requests plant specific details or actions to be added to the procedure, add the information to the procedure. However, if the operator actions are highly routine or well within the knowledge of the operator, the specific information should not be included. The reason for this should be explained on the documentation form.

4. If the ERG guideline fails to identify or address systems or actions that are unique to D. C. Cook (Refer to Appendix A), then steps should be included to encompass the necessary actions. These should be explained on the documentation form.*

5. If an ERG step specifies an action that cannot be performed at D. C. Cook, the step will be deleted or modified and the reason explained on the documentation form.

5.3 Method (Cont.)

6. If an ERG step is modified such that the intent of the step is changed, then the basis will be explained on the documentation form.

7. Minor modifications to ERGs steps are acceptable without extensive justification provided that the change does not alter the intent of the guideline. Examples of these types of changes are as follows:

   a. Deletions of level of detail (see item #3).

   b. Rewording of ERG steps to conform to standard D. C. Cook terminology, abbreviations and acronyms.

   c. Rearranging ERG steps to streamline the procedure due to D. C. Cook control room design and for operator convenience.

*All additions to and deletions from generic guidelines were verified/validated as part of the EOP verification/validation program. Part of the verification/validation procedure is to check the plant specific procedure against the generic procedure and ensure that; all additions and deletions of information are documented and analyzed and also that the order of steps (if changed) remains within the bounds of the step sequencing table (part of generic background information).

6. CONCLUSION

For the D. C. Cook Nuclear Power Station Unit 1, the generic Westinghouse Emergency Response Guidelines (ERGs), Revision 1 will be used as the basis for writing the plant specific Emergency Operating Procedures. This document provides a description of the planned method for developing the D. C. Cook EOPs from the generic Westinghouse guidelines. Also, deviations from the generic guidelines from an emergency operations perspective resulting from differences between the reference plant and D. C. Cook designs have been identified. It is intended that this document along with D. C. Cook Writers Guide for EOPs will be used to aid in the preparation of the D. C. Cook EOPs.

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

REACTOR TRIP ACTUATION SYSTEM

Reference Plant	D. C. Cook
0 Reactor Trip Signal	Same
0 Turbine Trip Signal	Same

ESF ACTUATION SYSTEM

Reference Plant	D. C. Cook
0 SI Actuation and Reset Signals	Same
0 Containment Spray Signal (Hi-3) and Reset	Hi-2(1)
0 Feedwater Isolation Signal Reset	Same
0 Main Steamline Isolation Signal	Same
0 Cont. Isolation Phase A Signal Reset	Same
0 Cont. Isolation Phase B Signal Reset	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

NUCLEAR INSTRUMENTATION SYSTEM

Reference Plant	D. C. Cook
O Source Range Startup Rate	Same
O Neutron Flux Recorder	Same

CONTROL ROD INSTRUMENTATION SYSTEM

Reference Plant	D. C. Cook
O Control Rod Position	Same
O Control Rod Bottom Lights	Same

CONTAINMENT INSTRUMENTATION SYSTEM

Reference Plant	D. C. Cook
O Containment Pressure	Same
O Containment Temperature	Same
O Containment Recirculation Sump Level	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

REACTOR COOLANT SYSTEM

Reference Plant	D. C. Cook
O 4-Loop	Same
O Hot & Cold Leg RTD Bypass	Same
O Two PORVs & Associated Block Valves	Three PORVs and Associated(1) Block Valves
O Three Code Safety Valves	Same
O RV Head Vent to Containment	Same
O RVLIS	Same

CHEMICAL & VOLUME CONTROL SYSTEM

Reference Plant	D. C. Cook
O Two Centrifugal Charging Pumps which are also used for SI	Same
O One PD Pump	Same
O Charging & RCP Seal Injection using one Charging Pump	Same
O Letdown-Regenerative HX, Letdown HX to VCT	Same
O 4% Boric Acid System	12%(1)
O Boric Acid Pumps Supply Charging pumps through either normal make-up or Emergency Boration Path	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

SAFETY INJECTION SYSTEM

Subsystem A

Reference Plant	D. C. Cook
0 Two Charging/SI Pumps take suction from RWST or Low-Head SI Pumps	Same
0 Charging/SI Pumps Shutoff Head > RCS Design Pressure	Same
0 12% BIT is injected by Charging/SI Pumps to all 4 Cold Legs	Same
0 BIT Contents are circulated by 2 Boron Injection Recirculation Pumps	B.A. Transfer Pumps(1)

Subsystem B

Reference Plant	D. C. Cook
0 Two High-Head SI Pumps with Shutoff Head of ~ 1600 psig	Same
0 High-Head SI Pumps take suction from RWST or Low-Head SI Pumps	Same
0 Suctions of Charging/SI and High-Head SI Pumps connected	Same
0 High-Head SI Pumps delivery to 4 Cold Legs (thru accumulator lines) and all 4 Hot Legs	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

Subsystem C

Reference Plant	D. C. Cook
O Two Low-Head SI Pumps	Same
O Low-Head SI Pumps take suction from RWST or Containment Sump	Same
O Low-Head SI Pumps deliver to 4 Cold Legs and concurrently feed Charging SI and High-Head SI Pumps (Cold Leg Recirculation Mode)	Same
O Low-Head SI Pumps deliver to 2 Hot Legs and concurrently feed Charging/SI and High-Head SI Pumps (Hot Leg Recirculation Mode)	Low-Head SI Pumps deliver to 4 Hot Legs(2)
O Switchover Initiation-Automatic Sump Valve Opening	Switchover Initiation(2) - Manually Stopping Low Head SI Pumps

Subsystem D

Reference Plant	D. C. Cook
O 4 Accumulator Tanks with Nitrogen Cover Gas	Same

RESIDUAL HEAT REMOVAL SYSTEM

Reference Plant	D. C. Cook
O Two Low-Head Pumps	Same
O Low-Head Pumps take suction from Two Hot Legs and return Flow to Four Cold Legs	One Hot Leg(1) Suction Connection

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

RADIATION MONITORING SYSTEM

Reference Plant	D. C. Cook
O Condenser Air Injector Monitor	Same
O SG Blowdown Monitor	Same
O Containment Atmosphere Monitor	Same
O Auxiliary Building Monitor	Same

CONTAINMENT SPRAY SYSTEM

Reference Plant	D. C. Cook
O Two Low-Head Containment Spray Pumps	Same
O N/A	Containment(3) Spray Heat Exchangers
O N/A	RHR Spray to Containment(4)

CONTAINMENT ATMOSPHERE CONTROL SYSTEM

Reference Plant	D. C. Cook
O Four Emergency Fan Coolers	N/A(5)
O N/A	Air Recirculation Fans(6) (Actuated on Hi-2 + 10 min.)
O Two Hydrogen Recombiners - Manual Actuation	Same
O N/A	Hydrogen Ignitors(7)

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

AUXILIARY FEEDWATER SYSTEM

Reference Plant	D. C. Cook
0 Two Motor Driven Pumps	Same
0 One Steam Driven Pump	Same
0 Condensate Storage Tank	Same
0 Alternate Water Supply	Same
0 AFW Control Valves	Same

MAIN STEAM SYSTEM

Reference Plant	D. C. Cook
0 Steam Generator PORVs	Same
0 Steam Generator Safety Valves	Same
0 Condenser Steam Dump Valves	Same
0 Main Steamline Isolation Valves	Same
0 Main Steamline Bypass Valves	Locally Operated(8) Manual Valves

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

COMPONENT COOLING WATER SYSTEM

Reference Plant	D. C. Cook
0 CCW Pumps	Same
0 RCP Thermal Barrier Valves	Same

SERVICE WATER SYSTEM

Reference Plant	D. C. Cook
0 Service Water Pumps	Same

MAIN FEEDWATER AND CONDENSATE SYSTEM

Reference Plant	D. C. Cook
0 Feedwater Flow Control Valves	Same
0 Feedwater Flow Control Bypass Valves	N/A(9)
0 Feedwater Isolation Valves	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

STEAM GENERATOR BLOWDOWN SYSTEM

Reference Plant	D. C. Cook
O SG Blowdown Isolation Valves	Same

SAMPLING SYSTEM

Reference Plant	D. C. Cook
O SG Blowdown Sample Isolation Valves	Same

SPENT FUEL STORAGE AND COOLING SYSTEM

Reference Plant	D. C. Cook
O Spent Fuel Pit level	Same

CONTROL ROD DRIVE MECHANISM COOLING SYSTEM

Reference Plant	D. C. Cook
O Control Rod Drive Mechanism Fans	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

CONTROL ROD CONTROL SYSTEM

Reference Plant	D. C. Cook
O Control Rods	Same

TURBINE CONTROL SYSTEM

Reference Plant	D. C. Cook
O Turbine Runback	Same

ELECTRIC POWER SYSTEM

Reference Plant	D. C. Cook
O Diesel-generators	Same

PNEUMATIC POWER SYSTEM

Reference Plant	D. C. Cook
O Instrument Air Compressor	Same
O Instrument Air Valves	Same

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

FOOTNOTES:

(1) No impact on the structure of D. C. Cook EOPs.

(2) ES-1.3 and ES-1.4 should be written to include the plant specific transfer to cold and hot leg recirculation procedure, which is included in the D. C. Cook SIS System Description.

(3) The containment spray heat exchangers are utilized, if needed, during the recirculation phase. Therefore, cooling water to the containment spray heat exchangers is required during the recirculation phase of a LOCA when containment spray is required. ES-1.3, ECA-1.1 and FR-Z.1 should be written to include this design feature.

(4) The D. C. Cook design has spray capability using the RHR pumps. RHR spray should be initiated if the containment pressure exceeds 8 psig following the initial blowdown. Also, RHR spray should not be used until the accident has progressed to the point when the ECCS is in the recirculation phase, or at least 30 minutes after the accident. RHR spray is in addition to the spray supplied by the containment spray pumps. The addition of RHR spray capability should be included into E-1 and FR-Z.1.

(5) The D. C. Cook plant design does not include safety related containment fan coolers that automatically start on an SI actuation signal. Therefore, steps in E-0, ECA-0.2, ECA-1.1 and FR-Z.1 should be modified to delete the emergency fan coolers.

APPENDIX A

COMPARISON OF SYSTEM DESIGNS

FOOTNOTES: (Cont.)

(6) The primary function of the air recirculation/hydrogen skimmer system is to assure containment pressure reduction after blowdown. This is accomplished by continuously circulating air from the upper to the lower compartment immediately after blowdown. The secondary function of this system is to prevent the unlikely accumulation of hydrogen in pocketed areas within the containment resulting from a LOCA. The air recirculation fans are automatically started by a Phase B signal after a 10 minute delay. The air recirculation/hydrogen skimmer system should be included in E-0, FR-Z.1 and ECA-0.2.

(7) The Distributed Ignition System ("hydrogen ignitors") is designed to provide additional hydrogen control capability in the unlikely event of a severe degraded core cooling event involving the generation of substantive amounts of hydrogen. The Distributed Ignition System should be considered for inclusion in E-1, FR-C.1, FR-C.2, FR-Z.1, FR-H.1, FR-I.3, ECA-0.0 and ECA-0.2.

(8) Main steamline bypass valve operation outside the control room may be an impact and should be evaluated.

(9) Feedwater flow control bypass valves are not included in the D. C. Cook plant design. Therefore, steps in E-0, FR-H.2 and FR-H.3 should be modified to delete the feedwater flow control bypass valves.

APPENDIX B

DETAILED COMPARISON OF SYSTEM DESIGNS

APPENDIX B

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS I(1)	REQUIREMENTS C(1)	D. C. COOK I	D. C. COOK C
Reactor Trip Actuation System				
Reactor Trip Annunciator	X	-	X	-
Reactor Trip and Bypass Breakers	X	-	X	-
Reactor Trip Signal	X	X	X	X
Turbine Trip Signal	X	X	X	X
ESF Actuation System				
SI Annunciator	X	-	X	- (2,3)
SI Signal	X	X	X	X
SI Signal Reset/Block	X	X	X	X
Low Steamline Pressure SI Actuation Signal Block	X	X	X	X
Low PRZR Pressure Si Actuation Signal Block	X	X	X	X
Containment Isolation Phase A Signal	X	X	X	X
Containment Isolation Phase A Signal Reset	X	X	X	X
Containment Isolation Phase B Signal Reset	X	X	X	X
Feedwater Isolation Signal Reset	X	X	X	X
Containment Spray Signal	X	X	X	X (4,3)
Containment Spray Signal Reset	X	X	X	X
Main Steamline Isolation Signal	X	X	X	X

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS I(1)	REQUIREMENTS C(1)	D. C. COOK I	D. C. COOK C
Nuclear Instrumentation System				
Power Range Neutron Flux	X	-	X	-
Intermediate Range Neutron Flux	X	-	X	-
Intermediate Range Startup Rate	X	-	X	-
Source Range Neutron Flux	X	-	X	-
Source Range Startup Rate	X	-	X	-
Neutron Flux Recorder	X	X	X	X
Source Range Detectors (Energize)	X	X	X	X
Control Rod Instrumentation System				
Control Rod Position	X	-	X	-
Control Rod Bottom Lights	X	-	X	-
Radiation Instrumentation System				
Containment Radiation	X	-	X	-
SG Blowdown Radiation	X	-	X	-
Condenser Air Ejector Radiation	X	-	X	-
Auxiliary Building Radiation	X	-	X	-
SG Steamline Radiation	X	-	X	-

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS		D. C. COOK	
	I(1)	C(1)	I	C
Containment Instrumentation System				
Containment Pressure	X	-	X	-
Containment Temperature	X	-	-	- (3)
Containment Recirculation Sump Level	X	-	X	-
Containment Hydrogen Concentration (Sample)	X	-	X	-
Phase A Containment Isolation Valves	X	X	X	X
Phase B Containment Isolation Valves	X	X	X	X
Containment Ventilation Isolation Dampers	X	X	X	X
Reactor Coolant System				
RCS Pressure	X	-	X	-
PRZR Pressure	X	-	X	-
RCS Hot Leg Wide Range Temperature	X	-	X	-
RCS Cold Leg Wide Range Temperature	X	-	X	-
RCS Average Temperature	X	-	X	-
Core Exit TC Temperature	X	-	X	-
PRZR Water Temperature	X	-	X	-
PRZR Level	X	-	X	-
Reactor Vessel Liquid Inventory System (RVLIS)	X	-	X	-
Reactor Coolant Pumps	X	X	X	X
PRZR PORVs	X	X	X	X (5,3)
PRZR PORV Blocks Valves	X	X	X	X
PRZR Spray Valves	X	X	X	X
Reactor Vessel Vent Valves	X	X	X	X
Pressurizer Heaters	X	X	X	X

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS I(1)	REQUIREMENTS C(1)	D. C. COOK I	D. C. COOK C
Safety Injection System				
Boron Injection Tank (BIT) Temperature	X	-	X	-
Refueling Water Storage Tank (RWST) Level	X	-	X	-
Charging/SI Flow	X	-	X	-
High-Head SI Flow	X	-	X	-
High-Head SI Pumps	X	X	X	X
Accumulator Isolation Valves	X	X	X	X
Accumulator Vent Valves	X	X	X	X
BIT Inlet Isolation Valves	X	X	X	X
BIT Outlet Isolation Valves	X	X	X	X
Low-Head SI Pump Suction Valves from Containment Recirculation Sump	X	X	X	X (11,6)
Low-Head SI Pump Suction Valves from RWST	X	X	X	X
High-Head SI Pump Suction Valves from RWST	X	X	X	X
Low-Head SI Pump Discharge Valve to RCS Hot Legs	X	X	X	X (7,6)
Low-Head SI Pump Discharge Valve to RCS Cold Legs	X	X	X	X (7,6)
SI Valves	X	X	X	X
Residual Heat Removal System				
Low-Head SI (RHR) Flow	X	-	X	-
Low-Head SI (RHR) Pumps	X	X	X	X
Low-Head SI (RHR) Pump Suction Valves from RCS	X	X	X	X (6,17)

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS		D. C. COOK		
	I[(1)]	C[(1)]	I	C	
Chemical and Volume Control System					
Boric Acid Tank Temperature	X	-	X	-	
Charging Flow	X	-	X	-	
RCP Seal Injection Flow	X	-	X	-	
Letdown Flow	X	-	X	-	
RCP Number 1 Seal Leakoff Flow	X	-	X	-	
RCP Number 1 Seal Differential Pressure	X	-	X	-	
Charging/SI Pumps	X	X	X	X	
Positive Displacement Charging Pump	X	X	X	X	
Charging/SI Pump Suction Valves from RWST	X	X	X	X	
Charging/SI Pump Suction Valves from VCT	X	X	X	X	
Charging Line Isolation Valves	X	X	X	X	
Charging Line Flow Control Valve	X	X	X	X	
Charging Line Hand Control Valve	X	X	X	X	
Pressurizer Auxiliary Spray Valve	X	X	X	X	
RCP Seal Injection Outside Containment Isolation Valves	X	X	-	-	(18)
RCP Seal Return Outside Containment Isolation Valve	X	X	X	X	
Letdown Isolation Valves	X	X	X	X	
Letdown Orifice Isolation Valves	X	X	X	X	
Low Pressure Letdown Control Valve	X	X	X	X	
Excess Letdown Isolation Valves	X	X	X	X	
VCT Makeup Control System	X	X	X	X	(12,3)
VCT Makeup Control System (Mode Selector)	X	X	X	X	

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS I[1]	REQUIREMENTS C[1]	D. C. COOK I	D. C. COOK C
Component Cooling Water System				
CCW Pumps	X	X	X	X
RCP Thermal Barrier CCW Return Inside Containment Isolation Valve	X	X	X	X
RCP Thermal Barrier CCW Return Outside Containment Isolation Valve	X	X	X	X
CCW Valves	X	X	X	X
Service Water System				
Service Water Pumps	X	X	X	X
Service Water Valves	X	X	X	X
Containment Spray System				
Containment Spray Pumps	X	X	X	X (8,9)
Containment Spray Valves	X	X	X	X
Containment Atmosphere Control System				
Containment Ventilation Isolation Dampers	X	X	-	- (10)
Containment Fan Coolers	X	X	-	-
Hydrogen Recombiners	X	X	X	X (13,14)
Containment Air Circulation Equipment	X	X	-	-
Containment Filtration Equipment	X	X	-	-

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS I[1]	REQUIREMENTS C[1]	D. C. COOK I	D. C. COOK C	
Main Steam System					
SG Pressure	X	-	X	-	
SG Narrow Range Level	X	-	X	-	
SG Wide Range Level	X	-	X	-	
SG PORVs	X	X	X	-	
Condenser Steam Dump Valves	X	X	X	X	
Main Steamline Isolation Valves	X	X	X	X	
Main Steamline Isolation Bypass Valves	X	X	-	-	(15)
Steam Supply Valves to Turbine-Driven AFW Pump	X	X	X	X	
Turbine Stop Valves	X	-	X	-	
Main Feedwater and Condensate System					
FW Flow Control Valves	X	X	X	X	
FW Flow Control Bypass Valves	X	X	-	-	(16)
FW Isolation Valves	X	X	X	X	
Auxiliary Feedwater System					
Auxiliary Feedwater Flow	X	-	X	-	
Condensate Storage Tank Level	X	-	X	-	
MD AFW Pumps	X	X	X	X	
Condensate Storage Tank to Hotwell Isolation Valves	X	X	-	-	(18)
AFW Valves	X	X	X	X	

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS		D. C. COOK	
	I(1)	C(1)	I	C
Steam Generator Blowdown System				
SG Blowdown Isolation Valves	X	X	X	X
Sampling System				
SG Blowdown Sample Isolation Valves	X	X	X	X
Spent Fuel Storage and Cooling System				
Spent Fuel Pit Level	X	-	X	-
Control Rod Drive Mechanism Cooling System				
Control Rod Drive Mechanism Fans	X	X	X	X
Control Rod Control System				
Control Rods	X	X	X	X
Turbine Control System				
Turbine Runback	X	X	X	X
Electric Power System				
Diesel-Generators	X	X	X	X

APPENDIX B (Cont.)

DETAILED COMPARISON OF SYSTEM DESIGNS

ITEM	REQUIREMENTS		D. C. COOK	
	I(1)	C(1)	I	C
Pneumatic Power System				
Instrument Air Compressor	X	X	X	X
Instrument Air Valves	X	X	X	X

APPENDIX B

COMPARISON OF SYSTEM DESIGNS

FOOTNOTES

(1) I - Instrumentation requirements column
C - Control requirements column
An "X" entry indicates an instrumentation or control requirement within the scope of the plant
A "-" entry indicates no requirement

(2) SI Status Light

(3) No impact on the structure of D. C. Cook EOPs.

(4) Hi-2 vs. Hi-3 actuation

(5) Three PORVs and associated block valves.

(6) ES-1.3 and ES-1.4 should be written to include the plant specific transfer to cold and hot leg recirculation procedure, which is included in the D. C. Cook System Description.

(7) Low head SI pumps deliver to 4 hot legs

(8) The containment spray heat exchangers are utilized, if needed, during the recirculation phase. Therefore, cooling water to the containment spray heat exchangers is required during the recirculation phase of a LOCA, when containment spray is required. ES-1.3, ECA-1.1 and FR-Z.1 should be written to include this design feature.

(9) The D. C. Cook design has spray capability using the RHR pumps. RHR spray should be initiated if the containment pressure exceeds 8 psig following the initial blowdown. Also, RHR spray should not be used until the accident has progressed to the point when ECCS is in the recirculation phase, or at least 30 minutes after the accident. RHR spray is in addition to the spray supplied by the containment spray pumps. The addition of RHR spray capability should be included into E-1 and FR-Z.1.

(10) The D. C. Cook plant design does not include safety related containment fan coolers that automatically start on an SI actuation signal. Therefore, steps in E-0, ECA-0.2, ECA-1.1 and FR-Z.1 should be modified to delete the emergency fan coolers.

(11) Low head SI pump suction valves from the containment recirculation sump do not automatically open on low RWST level. Switchover is manually initiated after stopping the low head SI pumps.

(12) 12 wt. % boric acid is used in the Makeup System.

(13) The primary function of the air recirculation/hydrogen skimmer system is to assure containment pressure reduction after blowdown. This is accomplished by continuously circulating air from the upper to the lower compartment immediately after blowdown. The secondary function of this system is to prevent the unlikely accumulation of hydrogen in pocketed areas within the containment following a LOCA. The air recirculation fans are automatically started by a phase B signal after a 10 minute delay. The air recirculation/hydrogen skimmer system should be included in E-0, FR-Z.1 and ECA-0.2.

(14) The Distributed Ignition System (hydrogen ignitors) is designed to provide additional hydrogen control capability in the unlikely event of a severe degraded core cooling event involving the generation of substantive amounts of hydrogen. The Distributed Ignition System should be considered for inclusion in E-1, FR-C.1, FR-C.2, FR-Z.1, FR-H.1 FR-1.3, ECA-0.0 and ECA-0.2.

(15) Main steamline bypass valve operation outside the control room may be an impact and should be evaluated.

(16) Feedwater flow control bypass valves are not included in the D. C. Cook plant design. Therefore, steps in E-0, FR-H.2 and FR-H.3 should be modified to delete the feedwater flow control bypass valves.

(17) RHR suction from one hot leg connection

(18) Local valves

APPENDIX C

EMERGENCY RESPONSE GUIDELINES, REVISION 1 LISTING

APPENDIX C

EMERGENCY RESPONSE GUIDELINES
OPTIMAL RECOVERY GUIDELINES

E-0	Reactor Trip or Safety Injection
ES-0.0	Rediagnosis
ES-0.1	Reactor Trip Response
ES-0.2	Natural Circulation Cooldown
ES-0.3	Natural Circulation Cooldown for Steam Void in Vessel (with RVLIS)
ES-0.4	Natural Circulation Cooldown for Steam Void in Vessel (without RVLIS)
E-1	Loss of Reactor or Secondary Coolant
ES-1.1	SI Termination
ES-1.2	Post-LOCA Cooldown and Depressurization
ES-1.3	Transfer to Cold Leg Recirculation
ES-1.4	Transfer to Hot Leg Recirculation
E-2	Faulted Steam Generator Isolation
E-3	Steam Generator Tube Rupture
ES-3.1	Post-SGTR Cooldown Using Backfill
ES-3.2	Post-SGTR Cooldown Using Blowdown
ES-3.3	Post-SGTR Cooldown Using Steam Dump
ECA-0.0	Loss of All A.C. Power
ECA-0.1	Loss of All A.C. Power Recovery Without S.I. Required
ECA-0.2	Loss of All A.C. Power Recovery With S.I. Required
ECA-1.1	Loss of Emergency Coolant Recirculation
ECA-1.2	LOCA Outside Containment
ECA-2.1	Uncontrolled Depressurization of All Steam Generators
ECA-3.1	SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired
ECA-3.2	SGTR With Loss of Reactor Coolant - Saturated Recovery Desired
ECA-3.3	SGTR Without Pressurizer Pressure Control

APPENDIX C

EMERGENCY RESPONSE GUIDELINES

FUNCTION RESTORATION GUIDELINES

F-0	The Critical Safety Function Status Trees
F-0.1	Subcriticality
F-0.2	Core Cooling
F-0.3	Heat Sink
F-0.4	Integrity
F-0.5	Containment
F-0.6	Inventory
FR-S.1	Response to Nuclear Power Generation/ATWS
FR-S.2	Response to Loss of Core Shutdown
FR-C.1	Response to Inadequate Core Cooling
FR-C.2	Response to Degraded Core Cooling
FR-C.3	Response to Saturated Core Cooling Conditions
FR-H.1	Response to Loss of Secondary Heat Sink
FR-H.2	Response to Steam Generator Overpressure
FR-H.3	Response to Steam Generator High level
FR-H.4	Response to Loss of Normal Steam Release Capabilities
FR-H.5	Response to Steam Generator Low level
FR-P.1	Response to Imminent Pressurized Thermal Shock Conditions
FR-P.2	Response to Anticipated Pressurized Thermal Shock Conditions
FR-Z.1	Response to High Containment Pressure
FR-Z.2	Response to Containment Flooding
FR-Z.3	Response to High Containment Radiation Level
FR-I.1	Response to High Pressurizer Level
FR-I.2	Response to Low Pressurizer Level
FR-I.3	Response to Voids in Reactor Vessel

APPENDIX D

D. C. COOK EOP DOCUMENTATION FORM

APPENDIX D

D. C. COOK EOP DOCUMENTATION FORM

EOP No. ______________________ Rev. ______________________

Title ____

Prepared by: ______________________ Date ____________

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OR BASIS FOR DIFFERENCE

D. C. COOK UNIT 1

DOCUMENTATION FORMS

FOR

EMERGENCY OPERATING PROCEDURES

BASED ON

REVISION 1

OF

THE WESTINGHOUSE OWNERS GROUP

HIGH PRESSURE

EMERGENCY RESPONSE GUIDELINES

D. C. COOK EOP STEP DOCUMENTATION FORM

INTRODUCTION

The EOP step documentation form was developed for the purpose of documenting the technical differences between the WOG ERGs and the D. C. Cook EOPs as described in Part 5.3 of the Plant Specific Technical Guidelines. Recorded on these forms are the technical differences, and the explanations or bases for them. The documentation forms are compiled in order of procedure number, and can be used effectively with the following information:

1) When there are technical differences between a given EOP and its corresponding ERG, the EOP step number will be listed in the left column of the form. The step number of the respective ERG step will be listed in the center column, and the explanation or basis of the difference will be given in the right column.

2) A copy of the ERGs and EOPs must be used in conjunction with step documentation forms as a step text is not presented on the forms.

3) For EOP steps not listed on the forms, there are no technical differences from the ERG steps. Therefore, no explanation or bases are needed.

(Revisions made to the original document are indicated by margin bars)

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023. E-0 Rev. 0

Title Reactor Trip or Safety Injection

Prepared by: K. Victor Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
5 A/ER	5 A/ER	• Deleted FW flow control bypass valves and added FW pump discharge valves per Cook design
--	11	• Deleted step. No fan coolers in ice condenser containment.
17	13	• Reversed intent of high level step to clarify plant specific setpoint requirements. Also, no S/G stop valve bypass valves in Cook design.
18 a(4 RNO	14 a RNO	• Included air recirculation/hydrogen skimmer fans to step due to ice condenser containment.
19 c RNO	19 c RNO	• No S/G stop valve bypass valves in Cook design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-0.0 Rev. 0

Title Rediagnosis

Prepared by: J. Reddomg Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
	NONE	

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-0.1 Rev. 0

Title Reactor Trip Response

Prepared by: R. Starz Date 2/16/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1c RNO	1c RNO	• No S/G stop valve bypass valves in Cook desig:
8 Note	8	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allw the cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-0.2 Rev. 0

Title Natural Circulation Cooldown

Prepared by: C. Morgan Date 2/16/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
6 Note	6	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow the cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-0.3 Rev. 0

Title Natural Circulation Cooldown with Steam Void in Vessel (With RVLIS)

Prepared by: D. Dickehuth Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1 A/ER, RNO	--	• Added step to determine if RVLIS is available per utility request to incorporate in ES-0.4.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023. ES-0.4 Rev. 0

Title Natural Circulation Cooldown w/Steam Void in Vessel (Without RVLIS)

Prepared by: J. Gibbons Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1	-	• Added step to determine if RVLIS is available per utility request to incorporate this procedure.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.E-1 Rev. 0

Title Loss of Reactor or Secondary Coolant

Prepared by: R. J. Lopiccolo Date 2/27/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
5b	5b	o Deleted substep to check power available because operator verified power once per shift. Also, breaker indication lights and identification are on the control board. Breakers will not trip on an SI signal.
11	--	o Added step to turn on hydrogen ignitors.
16	--	o Step added due to plant design for RHR spray capability.
17 Note	17	o Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reached 541°F to allow cooldown valves to operate.
--	19b	o This portion of checking circuit breakers is accomplished in 19a because checking status lights verifies valves are closed and breakers are energized (closed).

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-1.1 Rev. 0

Title SI Termination

Prepared by: J. Redding Date 3/7/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
6	6	• Reworded step because reference plant did not address miniflow isolation valves. Also, charging line header valve is used to ensure seal injection and protect from CCP runout.
16	16	• Reworded high level step because criteria to establish seal return flow are local indications.
17	17	• Added not to place steam dump control selector in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.
29	-	• Added new step to recirculate BIT. This prevents more than one tank from being out of specification due to dilution from BIT.
30	-	• Added step to realign ECCS to give correct status light indication.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-1.2 Rev. 0

Title Post Loca Cooldown and Depressurization

Prepared by: E. F. Tacik Date 2/29/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
7 Note	7	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.
16	16	• Reworded step because reference plant did not address miniflow isolation valves. Also charging line header valve is used to ensure seal injection and protect from CCP runout.
23	23	• Accumulator isolation valves are always locke[d] out so the A/ER column was changed to restori[ng] power to the isolation valves.
26	26	• Reworded high level step because criteria to establish seal return flow are all local indications.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-1.3 Rev. 0

Title Transfer to Cold Leg Recirculation

Prepared by: A. J. Sabol Date 2/27/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
General	General	o The ERG guidance showing typical tasks pertaining to the transfer to cold leg recirculation does not apply to the D. C. Cook design. The procedure was written according to plant design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-1.4 Rev. 0

Title Transfer to Hot Leg Recirculation

Prepared by: A. J. Sabol Date 2/27/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
General	General	o The ERG Guidance showing typical tasks pertaining to the transfer to hot leg recirculation does not apply to the D. C. Cook design. The procedure was written according to plant design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.E-2 Rev. 0

Title Faulted Steam Generator Isolation

Prepared by: K. Victor Date 2/2/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1 A/ER	1 A/ER	• No S/G stop valve bypass valves in Cook design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.E-3 Rev. 0

Title Steam Generator Tube Rupture

Prepared by: R. J. Lopiccolo Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
5 b RNO	3b RNO.	• No S/G stop valve bypasss valves in Cook design.
7a	5a	• Deleted substep to check power available because operator verifies power once per shift. Also, breaker indication lights and identificat: are on the control board. Breakers will not trip on an SI signal.
14 Note	14 Note	• Added not to place steam dump control selectors in BYPASS INTERLACK when Tavg reaches 541°F to allow the cooldown valves to operate.
22	22	• Reworded step because reference plant did not address miniflow valves. Also charging line header valve is used to ensure seal injection and protect from CCP runout.
34	34	• Reworded high level step because criteria to establish seal return flow are all local indications.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-3.1 Rev. 0

Title Post - SGTR Cooldown Using Backfill

Prepared by: C. Swenson Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2 b	1 b	• Accumulator isolation valves are always locked out so the A/ER was changed to restoring power to the valves.
5 Note	5	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow the cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-3.2 Rev. 0

Title Post - SGTR Cooldown Using Blowdown

Prepared by: J. D. Andrachek Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2b	2b	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to the valves.
5 Note 16 Note	5 16	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ES-3.3 Rev. 0

Title Post - SGTR Cooldown Using Steam Dump

Prepared by: A. J. Sabol Date 2/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2b	2b	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to the valves.
5 Note 11Note 16 Note	5 11 16	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-0.0 Rev. 0

Title Loss of All AC Power

Prepared by: J. D. Gibbons, Jr. Date 4/18/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1 A/ER	1 A/ER	Deleted "Rod Bottom Lights - LIT" because indicators will not light on loss of all AC. Changed rod position indicators to less than 25 steps because easy to read for reactor trip verification.
21a	--	Added step for Hydrogen igniters.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-0.1 Rev. 0

Title Loss of All Power Recovery Without SI Required

Prepared by: J. D. Gibbons, Jr. Date 3/10/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1aRNO	1aRNO	• Changed 2) RNO to read locally close valves and eliminated the part of the step which said to locally close valves if valves can not be manually closed. Isolation valves outside cnmt are not motor operated. Valves were locally checked closed in step 7 of ECA-0.0.
1bRNO	1bRNO	• No motor operated isolation valves inside cnmt so part of 2) eliminated.
-	3d A/ER	• Deleted containment fan coolers.
4	4	• Reworded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and prevent from CCP runout.
11	11	• Reworded high level step because criteria to verify seal return flow are all local indicati

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-0.2 Rev. 0

Title Loss of All AC Power Recovery With SI Required

Prepared by: J. Andrachek Date 3/23/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
3a RNO	3a RNO	Deleted statement to close CCW return isolation valves inside containment because Cook has two valves outside containment and only hand valves inside.
--	4	No emergency fan coolers in Cook design.
5b RNO	5b RNO	Seal injection valves outside containment are hand valves to RNO column was changed to read locally close valves.
7a RNO	--	Added step for air recirculation/hydrogen skimmer system.
8	--	Added step for Hydrogen igniters.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-1.1 Rev. 0

Title Loss of Emergency Coolant Recirculation

Prepared by: C. Swenson Date 3/5/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
3 Note 16 Note 17 Note 20 Note 22 Note	3 17 18 21 23	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.
-	4	• Deleted step. No fan coolers in ice condenser containment.
5b Table	6b Table	• Deleted appropriate columns to accomadate for ice condenser containment.
18	19	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to the isolation valves.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023,ECA-1.2 Rev. 0

Title LOCA Outside Containment

Prepared by: R. Starz Date 3/2/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
NONE		

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-2.1 Rev. 0

Title Uncontrolled Depressurization of All Steam Generators

Prepared by: J. D. Gibbons Date 2/21/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1	1	• No S/G stop valve bypass valves in Cooks desig:
5a	5a	• Deleted substep to check power available because operator verifies power once per shift. Also, breaker indication lights and identification are on the control board. Breakers will not trip on an SI signal.
15	15	• Reworded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and protect from CCP runout.
27	27	• Reworded high level step because criteria to verify seal return flow are all local indicati·
37b	37b	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to the isolation valves.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-3.1 Rev. 0

Title SGTR With Loss of Reactor Coolant - Subcooled Recovery Desired

Prepared by: R. J. Lopiccolo Date 2/23/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
10 Note	10	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow the cooldown valves to operate.
20	20	• Reworded step because reference plant did not address miniflow valves. Also charging line header valve is used to ensure seal injection and protect from CCR runout.
27	27	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to isolation valves.
31	31	• Reworded high level step because criteria to verify seal return flow are all local indications.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-3.2 Rev. 0

Title SGTR With Loss Of Reactor Coolant-Saturated Recovery Desired

Prepared by: A. J. Sabol Date 2/17/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
5 Note	5	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reach 541°F to allow cooldown valves to operate.
14	14	• Reworded step because reference plant did not address miniflow valves. Also charging line header is used to ensure seal injection and protect from CCP runout.
21	21	• Accumulator isolation valve are always locked out so the A/ER column was changed to restore power to isolation valves.
25	25	• Reworded high level step because criteria to verify seal return flow are all local indications.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.ECA-3.3 Rev. 0

Title SGTR Without Pressurizer Pressure Control

Prepared by: C. Swenson Date 3/16/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
4c 10	4c 9	• Rewarded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and protect from CCP runout.
19	18	• Reworded high level step because criteria to verify seal return flow are all local indications.
23b	22b	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to the isolation valves.
26 NOTE 34 NOTE	25 33	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-S.1 Rev. 0

Title Response to Nuclear Power Generation/ATWS

Prepared by: C. Morgan Date 3/2/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2a RNO	2a RNO	• No S/G stop valve bypass valves in Cook design
4	4	• Step was changed to inject the BIT as this is the best method for rapid boration.
5	4d	• Step 4d became new step 5 since step 4 was changed to injec[illegible] BIT.
10	9	• No S/G stop valv[illegible] valves in Cook design

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-S.2 Rev. 0

Title Response to Loss of Core Shutdown

Prepared by: J. D. Andrachek Date 2/20/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
NONE		

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-C.1 Rev. 0

Title Response To Inadequate Core Cooling

Prepared by: J. Andrachek Date 2/20/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2	-	• Added step to turn on H_2 ignitors, per ice condensor modification.
5 Note	4	• Accumulator isolation valves are always locked out so the A/ER column was changed to restoring power to isolation valves.
11a	10a	• Deleted substep to check power available because operator verifies power once per shift. Also, breaker indication lights and identification are on the control board. Breakers will not trip on an SI signal.
12 Note 15 Note	11 14	• Added note to place steam dump control selectors in BYPASS INTERLOCK when Tavg reaches 541°F to allow cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-C.2 Rev. 0

Title RESPONSE TO DEGRADED CORE COOLING

Prepared by: J. D. ANDRACHEK Date 3/24/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2 A/ER	-	• Added new step to turn on hydrogen ignitors
9	8	• Accumulator isolation valves are always locked out, so A/ER column was changed to restoring power to isolation valve breakers. Also breakers will not trip on an SI signal.
11 Note 15 Note	11 15	• Added note to place steam dump control selectors in BYPASS INTERLOCK when tavg reaches 541°F, to allow cooldown valves to operate.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-C .3 Rev. 0

Title RESPONSE TO SATURATED CORE CONDITIONS

Prepared by: J. D. ANDRACHEK Date 3/30/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
3	3a	• Deleted step for checking power to PORV block valves because operator checks once per shift and breaker indication lights and identification are on the control board. Also, breaker will not trip on SI signal.

APPENDIX C

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-H.1 Rev. 0

Title Response to Loss of Secondary Heat Sink

Prepared by: D. Dickehuth Date 3/13/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
15	15a	• Deleted substep to check power available because operator verifies power once per shift. Also, breaker indication lights and indicatior. are on the control board. Breakers will not trip on an SI signal.
25	25	• Reworded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and prevent from CCP runout.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-H.2 Rev. 0

Title Response to Steam Generator Overpressure

Prepared by: J. D. Andrachek Date 4/4/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2	2	o No feedwater bypass valves in Cook design.
4	4	o No S.G. stop valve bypass valves in Cook design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-H.3 Rev. 0

Title Response to Steam Generator High Level

Prepared by: A. J. Sabol Date 3/27/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2	2	o No feedwater bypass valves in Cook design.
6	6	o No S/G stop valve bypass valves in Cook design.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-H.4 Rev. 0

Title Response to Loss of Normal Steam Release Capabilities

Prepared by: J. D. Gibbons, Jr. Date 4/5/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
	NONE	

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-H.5 Rev. 0

Title Response to Steam Generator Low Level

Prepared by: A. J. Sabol Date 4/16/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
	NONE	

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-P.1 Rev. 0

Title Response to Imminent Pressurized Thermal Shock Condition

Prepared by: E. Tacik Date 3/4/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2	2	• Deleted substep to check power available because operator verifies power once per shift. Also, breaker indication lights and identification are on the control board. Breakers will not trip on an SI signal, substep B was moved to high level response to follow ERG format.
10	10	• Reworded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and protect from CCP runout.
14a	14a	• Accumulator isolation valves are always locked out so A/ER column was changed to restoring power to isloation valves.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-P.2 Rev. 0

Title Response To Anticipated Pressurized Thermal Shock Condition

Prepared by: A. J. Sabol Date 4/16/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
1.c. RNO	1.c.RNO	• No S/G stop valve bypass valves in Cook desig

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-Z.1 Rev. 0

Title Response to High Containment Pressure

Prepared by: A. J. Sabol Date 4/25/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
3	3	o Step modified for ice condenser containment because spray pumps will already be operating with this procedure in effect.
4	3d A/ER	o Phase B isolation valves was made a new step since step 3 was changed to verify containment spray operation.
--	4	o Step deleted because no fan coolers in ice condenser containment.
5	5	o No S/G stop valve bypass valves in Cook design.
6	--	o New step for ice condenser modification.
8	--	o New step due to plant design for RHR spray capability.
9	--	o New step added to turn on Hydrogen ignitors.
--	9	o Step deleted because Cook design continuously monitors hydrogen concentration which is initiated in Step 8b.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-Z.2 Rev. 0

Title Response to Containment Flooding

Prepared by: A. J. Sabol Date 4/11/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
NONE		

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-Z-3 Rev. 0

Title Response to High Containment Radiation Level

Prepared by: A. J. Sabol Date 4/20/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
	NONE	

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-I.1 Rev. 0

Title Response to High Pressurizer Level

Prepared by: A. J. Sabol Date 4/10/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2cRNO	2cRNO	• Reworded step because reference plant did not address miniflow valves. Also charging line header valve is used to ensure seal injection and protect from CCP runout.
4	4	• Reworded high level step because criteria to verify seal return flow are all local indications.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-I.2 Rev. 0

Title Response to Low Pressurizer Level

Prepared by: K. J. Victor Date 4/15/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2cRNO	2cRNO	• Reworded step because reference plant did not address miniflow valves. Also, charging line header valve is used to ensure seal injection and protect from CCP runout.

D. C. COOK EOP BACKGROUND DOCUMENTATION FORM

EOP No. 01-OHP 4023.FR-I.3 Rev. 0

Title Response to Voids in Reactor Vessel

Prepared by: A. J. Sabol Date 4/24/84

D. C. COOK STEP NO.	ERG STEP NO.	EXPLANATION OF DIFFERENCE OR BASIS
2c RNO	2c RNO	o Reworded step because reference plant did not address miniflow valves. Also, charging line header valves is used to ensure seal injection and protect from CCP runout.
17		o Added step for hydrogen igniters.