



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

July 25, 2001

Carolina Power & Light Company
ATTN: Mr. J. W. Moyer
Vice President
H. B. Robinson Steam Electric Plant Unit 2
3581 West Entrance Road
Hartsville, SC 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT - NRC INSPECTION REPORT
50-261/01-07

Dear Mr. Moyer:

On June 22, 2001, the Nuclear Regulatory Commission (NRC) completed an inspection at the H.B. Robinson Steam Electric Plant. The enclosed report documents the inspection findings which were discussed on June 22, 2001, with you and other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved selected examination of procedures and representative records, observations of activities, and interviews with personnel.

No findings of significance were identified during the inspection.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles R. Ogle, Chief
Engineering Branch
Division of Reactor Safety

Docket No: 50-261
License No: DPR-23

Enclosure: (See page 2)

Enclosure: Inspection Report
No. 50-261/01-07 w/Attachment

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No: 50-261
License No: DPR-23

Report No: 50-261/01-02

Licensee: Carolina Power & Light (CP&L)

Facility: H. B. Robinson Steam Electric Plant, Unit 2

Location: 3581 West Entrance Road
Hartsville, SC 29550

Dates: June 4 - 8, 2001 (Week 1)
June 18 - 22, 2001 (Week 2)

Inspectors: J. Lenahan, Senior Reactor Inspector (Team Leader)
J. Blake, Senior Project Manager
R. Moore, Reactor Inspector
C. Smith, Senior Reactor Inspector
M. Maymi, Reactor Inspector
S. Walker, Reactor Inspector

Approved By: Charles R. Ogle, Chief
Engineering Branch
Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000261-01-07, on 6/4-22/01, Carolina Power and Light Company, H. B. Robinson, Unit 2, safety system design.

This safety system design and performance capability inspection was conducted by regional inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/NRR/OVERSIGHT/index.html>. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation.

No findings of significance were identified.

REPORT DETAILS

1. **REACTOR SAFETY** **CORNERSTONES: Initiating Events and Mitigating Systems**

1R21 Safety System Design and Performance Capability (71111.21)

.1 System Needs

a. Inspection Scope

Emergency Diesel Generator (EDG) and Dedicated Shutdown Diesel Generator (DSDG) Diesel Fuel Oil

The team reviewed design documentation, drawings, calculations, technical manuals, test documentation, and installed equipment to verify that an adequate supply of fuel oil was available to operate the EDG and DSDG for the period of time assumed in the accident analysis. Included in the review were the following: calculations for sizing of the fuel oil storage tanks, design of the fuel oil transfer pumps, and diesel testing performed to determine the fuel consumption rate and fuel oil volume required for seven days operation. The team also reviewed the station acceptance criteria for fuel oil quality to verify these were consistent with the EDG and DSDG vendor recommendations and applicable industry standards.

EDG and DSDG Starting Air

The team reviewed design documentation and equipment specifications to verify that the air start system capability and storage capacity were consistent with design basis assumptions. This included calculations for air receiver sizing and test documentation to verify multiple start capability.

Operator Actions

The team reviewed pertinent operating instructions for the loss of offsite power (LOOP) and station blackout (SBO) events to verify that the instructions specified appropriate operator actions and that those actions could be performed in a timely manner commensurate with the significance of the action. The operator actions were also reviewed for consistency with the accidents described in the Updated Final Safety Analysis Report (UFSAR), CP&L design criteria, and licensing basis documents. This review included abnormal operating procedures (AOPs) and end path procedures (EPPs). The team performed a walkdown of selected contingency operator actions delineated in the AOPs and EPPs for coping with the loss of the component cooling water (CCW) system. Selected actions included the connection of the fire water system to provide cooling to the charging pumps within the prescribed 75 minutes in order to maintain cooling to the reactor coolant pump (RCP) seals. The team also performed a walkdown of selected contingency operator actions delineated in the EPPs for recovering alternating current (AC) power with and without safety injection required, and provision for emergency control room ventilation during SBO conditions.

Heat Removal

EDG and DSDG Internal Lubrication and Cooling System

The team reviewed calculations and equipment specifications to verify that the internal cooling systems for the engine cooling and lubricating oil were adequate to maintain EDG and DSDG operation within vendor specifications. Data reviewed included heat transfer testing data sheets which verified the capacity of the EDG and DSDG heat exchangers.

Ventilation - Intake and Exhaust System and Equipment Space

The team reviewed design documentation, drawings, and calculations for the design of the heating, ventilation, and air conditioning (HVAC) systems for the EDG and DSDG spaces to verify that the systems were capable of maintaining ambient conditions within the ranges specified for equipment operation. This included the electrical equipment space ventilation and the EDG and DSDG intake and exhaust ventilation systems.

EDG Service Water Supply

The team reviewed the design and capability of the service water (SW) system to provide the required cooling for the EDG. The review included calculations, drawings, equipment specifications, flow balance test documentation, and equipment performance trending. This included heat transfer calculations which verified the capability of the EDG heat exchangers to function when the temperature of the SW supply reached 99 degrees Fahrenheit.

Station Blackout (SBO) Water Sources

Steam Driven Auxiliary Feedwater (SDAFW) Pump

The team reviewed the availability and capacity of the water sources required for secondary side cooling during an SBO event for the SDAFW Pump. These water sources included the condensate storage tank and the SW system. Documents reviewed included design documentation, calculations, operation procedures, tank and piping drawings, and test documentation. Calculations for the required volume and net positive suction head (NPSH) were reviewed to verify the basis for the capacity and volume assumptions contained within the calculations.

Steam Driven Auxiliary Feedwater Pump Steam Supply

The team reviewed design documentation, calculations, drawings, test data, and preventive maintenance documentation to assess the reliability of the steam supply system to the SDAFW Pump. This included verifying that system design included steam traps and strainers that operated properly to maintain the system free of condensate. The setup calculations and testing of the steam admission valves were reviewed to verify readiness and capability.

Alternate Cooling to Charging Pumps

The team reviewed design documentation, drawings, calculations, test documentation, and installed equipment to verify that the engine driven fire pump could be used to provide alternate cooling to the charging pumps during a loss of the CCW system.

b. Findings

No findings of significance were identified.

.2 System Conditions and Capability

a. Inspection Scope

Installed Configuration

The team performed a field walkdown of accessible equipment related to the operation of the EDG, the DSDG, and their support systems during LOOP and SBO conditions. In addition, a walkdown was also performed to examine the charging pumps and the SDAFW pump, including the SDAFW pump discharge lines, water sources and steam supply lines. This review was performed to assess material condition, identify degraded equipment and verify installed configuration was consistent with design drawings and calculation design inputs.

Design

Emergency Electrical Distribution System

The team reviewed design basis documents and design drawings for the 480 volt alternating current (VAC) emergency electrical distribution system in order to verify that the degraded voltage relay set point values for voltage magnitude and corresponding time delay were consistent with values specified in the Technical Specifications. The analytical limits upon which the degraded voltage dropout set points were based were also reviewed to ensure that steady state voltage criteria for risk significant equipment were not violated when fed from the preferred power supply during degraded voltage conditions. The loss of voltage relay set point values for voltage magnitude and corresponding time delay were also evaluated to verify compliance with the Technical Specifications. An instrument loop inaccuracy calculation performed for the degraded voltage relays was reviewed and “as-left” and “as-found” values of voltage and time delay set points were verified to be consistent with values listed in the Technical Specifications and the instrument calibration procedure. The team performed an independent design review of the loss of offsite power initiation logic to verify that automatic load sequence during an undervoltage condition, without a concurrent safety injection signal, was consistent with equipment operation described in UFSAR Section 8.3.1.1.2.

Emergency Diesel Generators (EDG) Support Systems

The team performed a design review of the EDG support systems such as the fuel oil system and the SW system for potential common cause failures of risk significant components which could cause failure of the EDGs to perform during accident conditions. The review included design basis documents, calculations, vendor information and design drawings. Field inspection of the as-built plant configuration was also performed to verify conformance with the drawings and design basis documents.

Service Water Check Valves

The team reviewed check valves SW-541 and SW-545 of the SW system for potential common cause failures. The review compared the installation and design of SW-541, an Anchor-Darling tilting disc check valve, with that of SW-545, a Crane tilting disc check valve, to ensure that the differences in the designs were sufficient to preclude common cause failures of the valves to open or close as required.

Dedicated Shutdown Diesel Generator (DSDG)

The team reviewed design documentation, calculations, drawings, vendor manuals, and operating procedures to verify the reliability and availability of the dedicated shutdown diesel generator. This included verifying the normal offsite feed to the dedicated shutdown (DS) bus output breaker 52/32 A and the DSDG feed to the DS bus output breaker 52/32 B had been properly designed and tested. The team reviewed Calculation 8S19-E-01 to verify that the dedicated shutdown diesel was capable of supplying power to all SBO mitigation loads for the required 7 hours specified in UFSAR Section 8.3.1.2.2.

Station Blackout Loads

The team reviewed design documentation, calculations, equipment specifications, and surveillance tests to verify that for the first hour of the SBO event, the dedicated shutdown loads could be adequately supplied by the 125 volts direct current (VDC) station battery A and the DS battery. The team verified the batteries were adequate to supply the required emergency loads for the design duty cycle. A field walk down of the battery rooms was performed to verify the as-built plant configuration was consistent with the drawings and design basis documents. In addition, the team reviewed selected 480 VAC and 120 VAC loads to verify adequate selective coordination had been established for the feeder circuit breakers fed from the dedicated shutdown diesel. This included identifying the various protective devices for such equipment as the motor control center (MCC) 5 and SW pump D breakers.

Testing

Engine Driven Fire Pump

The team reviewed completed weekly and annual functional test procedures for the engine driven fire pump to verify that the pump was operable and would be capable of providing an alternate supply of cooling water to safety significant pumps such as the charging pumps.

Service Water Turbine Isolation Valve

The team reviewed completed functional test procedures and test data for the Turbine Building SW isolation valve, SW V6-16C. The review included the dynamic test data package and the setup parameters for the valve actuator as well as the most recent surveillance to test the thermal overload and instantaneous trip functions of the molded case circuit breakers for supply to the actuator.

Dedicated Shutdown Diesel Generator (DSDG)

The team reviewed testing documentation to verify the reliability and availability of the DSDG. The review included the acceptance criteria for testing and maintenance of the DSDG and associated DS switchgear, buses, and transformers to verify these were consistent with the vendor requirements. The team reviewed the interlocks between the normal and DS breakers for MCC 5 and SW pump D to verify they had been properly configured and tested. The team also reviewed the last three maintenance tests performed on the 52/32 A, 52/32 B, 52/33 B, and 52/34 C breakers to verify consistency with the vendor recommendations.

480 VAC Undervoltage Relays

The inspectors reviewed work packages most recently completed for calibrating the undervoltage relays in order to ensure that these relays were calibrated in accordance with approved plant procedures and complied with acceptance criteria established by the Technical Specifications.

b. Findings

No findings of significance were identified.

.3 Selected Components

a. Inspection Scope

Component Inspection

The team reviewed maintenance and testing documentation to assess the licensee's actions to verify and maintain the safety function, reliability, and availability of selected components for the EDG and DSDG, and equipment required to function during an SBO event. EDG and DSDG components included the diesels, fuel oil storage tanks, heat exchanger thermostatic control valves, air start system boundary check valves, and relief valves. The SBO equipment reviewed included the steam generator power operated relief valve and actuator design, the design and operation of the nitrogen back up system, and

the SDAFW turbine and pump. SDAFW components included the turbine governor, flow control and feed regulating valves, pump runout head curve, bearing vibration, lubrication and clearances, and the overspeed trip mechanism.

The team also reviewed pump performance curves and motor/pump speed torque curves for the service water pump motors. This review was performed in order to verify that the motors were adequately sized based on mechanical load demand and were capable of performing their design function during a degraded voltage condition.

Diesel generator room supply fan motors performance curves were reviewed by the team in order to verify that the motors were adequately sized. The capability of the fan motors to perform their design function under degraded voltage conditions was evaluated based on review of a bounding analysis performed for generator "B" room supply fan HVS-6.

Design Changes

Steam Driven Auxiliary Feedwater (SDAFW) Pump

The team reviewed modification of equipment and components accomplished through the licensee's design change process (modification packages and engineering service requests) related to the SDAFW pump and its support systems. The review was performed to verify that system and equipment functions were appropriately evaluated and maintained by the licensee through the design change process, including the procurement process.

Reactor Coolant Pump Seal Replacement

The team reviewed the licensee's design change documentation for the procurement and installation of high temperature o-rings for the "A", "B", and "C" reactor coolant pump (RCP) seals in order to reduce the risk of a seal loss of coolant accident (LOCA) during LOOP and SBO conditions. The review included the installation documentation for the "B" and "C" pumps and plans for the installation in the "A" pump during a future outage.

480 VAC Emergency Electrical Distribution System

The team reviewed plant modification, MOD 1065, DGV Relay Set Point Change, which was developed and implemented by the licensee to revise the degraded voltage protection scheme for the 480 VAC emergency shutdown boards. The scope of the design change included revising the degraded voltage relay voltage set points to ensure that safety related continuous duty motors do not operate below specified voltage ratings. The time delay setting of the degraded voltage relays was not changed by the plant modification. The inspectors verified that a degraded voltage analysis had been performed and that the 480 VAC emergency electrical distribution system voltage analytical limit had been determined based on the lowest predicted switchyard voltage. The team evaluated the adequacy of the licensee's analysis of the 480 VAC auxiliary distribution system when supplied from the preferred power supply. Additionally, the team reviewed the licensee's engineering evaluation of the proposed degraded voltage relay drop out and reset set points delineated in Analysis EE107-CS-46. The team verified by review of design

documents and discussions with Transmission Systems personnel that changes to the grid were evaluated by the licensee to ensure that grid voltages remain acceptable for supporting operation of the nuclear unit.

The team reviewed design basis documents, calculations, vendor information and design drawings for the 480 VAC emergency shutdown electric distribution system. An instrument loop accuracy calculation prepared to demonstrate the technical adequacy of the revised voltage magnitude set point of the degraded voltage relays was also reviewed by the team. Field inspection of the as-built plant configuration was performed to verify compliance with drawings and design basis documents. Additionally, the capability of risk significant motors to perform their design function during degraded voltage conditions was evaluated.

Equipment Protection

The team reviewed design documentation, drawings, calculations, vendor manuals, vendor inspection reports, test documentation, and installed equipment to verify that the cathodic protection system was capable of providing adequate protection for the buried sections of the EDG fuel oil piping. The review included the operability of the cathodic protection system. The operability review included assessment reports of the system by two different contractors, the system design and installation contractor and an independent assessment contractor, as well as the results of periodic surveillance tests conducted by the licensee. The team examined the fuel oil transfer pumps to verify that the licensee had a program to protect the pumps from flooding. This including reviewing a design change which had been prepared to elevate the pumps one foot above their present elevation.

Operating Experience

The team reviewed SDAFW Pump and supporting systems' related operating experience evaluations to verify applicability and implementation of appropriate corrective actions in equipment and system design.

b. Findings

No findings of significance were identified.

.4 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed condition reports/action requests (CRs/ARs) and respective corrective actions related to the EDG and the DSDG and their support systems, and to the SDAFW Pump and its support systems to assess the adequacy of corrective actions and trending

for the identified problems. The team verified that the licensee was identifying procedural deficiencies at an appropriate threshold, that the deficiencies were entered into the corrective action program, and corrective actions were being taken for the identified deficiencies.

The team also reviewed selected self-assessment reports which documented the results of the licensee's periodic self-assessments performed on the EDG, DSDG, and related systems required to mitigate the LOOP/SBO events. The team reviewed the CRs/ARs that had been initiated by the licensee resulting from self-assessment findings.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA6 Management Meeting

The lead inspector presented the inspection results to Mr. J. Moyer, and other members of the licensee's staff at an exit meeting on June 22, 2001. The licensee acknowledged the findings presented. Proprietary information is not included in the inspection report.

PARTIAL LIST OF PERSONS CONTACTEDLicensee

R. Barnett, Superintendent, I&C/Electrical Engineering
C. Castell, Licensing Engineer
H. Chernoff, Supervisor, Licensing/Regulatory Programs
T. Cleary, Plant General Manager
J. Fletcher, Regulatory Affairs Manager
J. Henderson, Manager, Nuclear Assessment
S. Hinnant, Senior VP, Chief Nuclear Officer
E. Kapopoulos, Operations Manager
J. Moyer, Site Vice-President
E. Roth, Maintenance Manager
J. Sadauskas, EDG System Engineer
T. Simonson, Electrical/I&C Design Supervisor
J. Stanley, Mechanical Engineering Supervisor
D. Stoddard, Robinson Engineering Support Services Manager
T. Walt, Director of Site Operations

Other licensee employees contacted included engineers, operations personnel, and administrative personnel.

NRC

L. Reyes, Regional Administrator, Region II
C. Ogle, Chief, Engineering Branch, Division of Reactor Safety, Region II
B. Desai, Senior Resident Inspector
A. Hutto, Resident Inspector

ITEMS OPENED, CLOSED, OR DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Procedures

Abnormal Operating Procedure AOP-014, Component Cooling Water System Malfunction, Rev. 18

Annunciator Panel Procedure APP-007, Condensate and Feedwater, Rev. 26

Corrective Maintenance Procedure CM-008, Steam Driven AFW Pump, Turbine, and Auxiliaries Maintenance, Rev. 16

Corrective Maintenance Procedure CM-631, EDG AMOT Valve Maintenance, Rev. 8

Dedicated Shutdown Procedure DSP-002, Hot Shutdown Using the Dedicated/Alternate Shutdown System, Rev. 23

End Path Procedure EPP-1, Loss of All AC Power, Rev. 29

End Path Procedure EPP-2, Loss of All AC Power Recovery without SI Required, Rev. 14

End Path Procedure EPP-3, Loss Of ALL AC Power with SI Required, Rev. 13

End Path Procedure EPP-22, Energizing Plant Equipment Using Dedicated Shutdown Diesel Generator, Rev. 17

End Path Procedure EPP-23, Restoration of Cooling Water Flow to Reactor Coolant Pumps, Rev. 18

End Path Procedure EPP-25, Energizing Supplemental Plant Equipment Using DSDG, Rev. 11

Maintenance Surveillance Test MST-802, Dedicated Shutdown Diesel, UPS, and AMSAC Batteries (Annual), Rev. 8

Operations Surveillance Test OST-301, Service Water System (Refueling), Rev. 28

Operations Surveillance Test OST-603, Motor Driven Fire Pump and Engine Driven Fire Pump Test (Weekly), Rev. 21

Operations Surveillance Test OST-646, Fire Suppression Water System Engine Driven Fire Pump Test (Annual), Rev. 16

Operations Surveillance Test OST-911, Dedicated Shutdown Control Station Test, (Refueling), Rev. 18

Operations Surveillance Test OST-936, Emergency Equipment Inventory (Quarterly), Rev. 13

Operating Procedure OP-909, Fuel Oil System, Rev. 29

Predictive Maintenance Procedure PDM-001, Equipment Lube Oil Sampling, Rev. 37

Plant Program Procedure PLP-018, Q.A. Program for Non-Safety Systems and Equipment Used to Meet the SBO Rule, Rev. 10

Plant Program Procedure PLP-033, Post Maintenance Testing (PMT) Program, Rev. 21

Preventive Maintenance Procedure PM-017, Lubrication Manual, Rev. 10

Preventive Maintenance Procedure PM-112, Limitorque Inspection No. 1, Rev. 21

Preventive Maintenance Procedure PM-403, Cathodic Protection System Rectifier Inspection and Cleaning, Rev. 7

Preventive Maintenance Procedure PM-417, Cathodic Protection System Soil to Structure Potential Measurement Test, Rev. 6

Preventive Maintenance Procedure PM-435, Dedicated Shutdown Bus, 480 V Bus, and Exciter Field Breaker Inspection, Rev. 9

Plant Performance Procedure PPP-116, MS-V1-8A, B, C Differential Pressure Test, Rev. 1

Special Procedure SP-1196, Vibration Reference Value Collection, Rev. 1

Technical Management Procedure TMM-035, Post-Evaluation of MOV Performance, Rev. 17

Technical Management Procedure TMM-117, Lube Oil Analysis Program, Rev. 4

EGR-NGGC-0005, Engineering Service Requests, Rev. 15

EGR-NGGC-0012, Equipment Data Base, Rev.

EGR-NGGC-0153, Engineering Instrument Setpoints, Rev 8

CAP-NGGC-200, Corrective Action program, Rev. 2

CAP-NGGC-201, Self-Assessment Program, Rev. 4

CAP-NGGC-202, Operating Experience Program, Rev. 2

MOD-002, Design Calculations, Rev. 19

MOD-008, Fire Protection and Station Blackout Safe Shutdown Capability, Rev. 7

Calculations

RNP-C/STRS-1153, Diesel Air Line and AFW Line check Valves Replacement

RNP-C/STRS-1173, Operability Evaluation for EDG Exhaust Line, Rev. 0, dated 6/4/93

RNP-M/HVAC-1064, EDG A&B Room Steady State Temperature, Rev. 0, dated 1/18/99

RNP-I/INST-1015, Condensate Storage Tank Level Alarm Setpoint, Rev. 1

RNP-I/INST-1055, Auxiliary Feedwater Instrument Uncertainty

RNP-M/INST-1022, Component Selection, N2 Purge, Rev. 1, dated 1/4/92

RNP-M/MECH-1061, Analysis for EDG SW Flow Requirements for HBR-Unit 2, PCN 87-038/03

RNP-M/MECH-1173, Design Review for SW-541 and SW-545 for RNP Check Valve Design Review Project, Rev. 1 for ESR 98-00509, "North Service Water Header Pipe Replacement"

RNP-M/MECH-1460, NPSHa vs. CST Level for SDAFW Pump, Rev. 0

RNP-M/MECH-1517, Setup Calculation for MOV MS-V1-8A, Rev. 5

RNP-M/MECH-1519, Service Water System Operation With One Pump, for Robinson Nuclear Project, Rev 1 for ESR 97-00520, dated 9/24/99

RNP-M/MECH-1522, Setup Calculation for MOV MS-V1-8B, Rev. 5

RNP-M/MECH-1523, Setup Calculation for MOV MS-V1-8C, Rev. 5

RNP-M/MECH-1535, Set Up Calculation for MOV V6-16C, Rev 6

RNP-M/MECH-1649, EDG Heat Exchanger Analysis to Determine Allowable Ultimate Heat Sink Temperature, Rev. 2, dated 8/18/89

RNP-M/MECH-1653, Service Water System Hydraulic Evaluation, Rev 0

RNP-M/MECH-1667, Thermal Hydraulic Analysis for WCCU B, EDG B, and CCW Hx B with Temporary Discharge Piping, Rev. 1, dated (11/16/00)

RNP-E-2.017, 10 CFR 50 Appendix R Coordination Study of Protective Devices Associated with the 480 V DS Bus, MCC 24, PP-50, PP-51, and LP-41, Rev. 0

RNP-E-6.018, DC Control Circuit Loop Analysis for Robinson Nuclear Plant, Rev.0

RNP-E-6.020, Load Profile and Battery Sizing Calculation for Station Battery B, Rev. 3

RNP-E-6.021, Load Profile and Battery Sizing Calculation for Station Battery A, Rev. 2

RNP-E-6.028, DS Battery Sizing Calculation, Rev. 0

RNP-E-6.029, Dedicated Shutdown Diesel Generator (DSDG) Battery Sizing Calculation, Rev.0

RNP-E-6.031, Station Battery B Replacement, Rev. 1

RNP-E-8.002, AC Auxiliary Electrical Distribution System Voltage /Load Flow/Fault Current Study, Rev. 3.

RNP-E-9.021, 10 CFR 50 Appendix R Fuse Analysis for DS Bus, Rev. 0

RNP-S/HNGR-1000, Fuel Oil Gravity Drain System - EDG A, Rev. 5, dated 6/3/99

8S19-E-01, Verification of DS System Capacity for Station Blackout, Rev. 0

8S19-P-101, Station Blackout Coping Analysis Report, Rev. 5

469M-M-01, Station Blackout Study Condensate Inventory Requirements, Rev. 1

84065-M-06-F, New Basis for CST Level Indication for CST Repair and Restoration, Rev. 3

87-0017, Steam Generator Dry-Out, Rev. 0

8S43-M-01, SBO Study - RCS Coolant Inventory Loss, Rev. 1, dated 5/17/99

8S43-M-03, SBO - Loss of HVAC, HB Robinson Steam Electric Plant, Unit 2, Rev. 5 dated 3/3/95

Analysis 82226/03-M-01-F, EDG Fuel oil consumption for Various Load Profiles, Rev. 2, dated 6/28/89

Analysis 82226/03-M-02-F, DFOST Volume/Capacity Fuel Oil Availability to EDGs, Rev. 5, dated 6/17/99

Analysis 82226/03-M-04-F, Unit 1 Fuel Oil Storage capacity Available to DFOST, for unit 2 EDG Fuel Oil consumption Calculation, Rev. 1, dated 1/21/91

Analysis 84011-M-04-F, HBR HVAC Study (TAR 84-011) Rev. 0, dated 9/6/85

Analysis RNP-S/EQ-1039, Qualification of ASCO Pressure Switch - PCN 87-059/00, EDG A&B, Rev. 0, dated 11/2/88

Analysis RNP-I/INST-1030, Accuracy Calculation and Setpoint Determination for LIS-1966, DFOST Level Indicator/Alarm, Rev. 0, 10/9/91

Material Evaluation, ME-002638.00, Evaluation of EDG Thermostatic Control Valves (TCVs) related to NRC IN 91-85, rev. 1, Potential Failures of TCVs on Diesel Generator Jacket Cooling Water, dated 4/1/97

Engineering Evaluation, Evaluation of Proposed Degraded Grid Voltage Relay Drop Out and Reset Set Points for H. B. Robinson Nuclear Plant, Analysis I. D. EE107-CS-46, Revision 0.

Engineering Evaluation RNP M/MECH-1004, Station Blackout Coping Duration Requirements, Rev. 1, dated 9/10/90

Analysis for Emergency Bus - Degraded Grid Voltage Relay for H. B. Robinson Unit No. 2, Analysis I. D. RNP-I/INST-1010, Revision 2.

Drawings

B-190628, Sht. 834C, Wiring Diagram 52/33 B Service Water Pump D (Alt. Power), Rev. 6

B-190628, Sht. 1015, Wiring Diagram 52/32 A Feed to 480 V Bus DS, Rev. 10

B-190628, Sht. 1016, Wiring Diagram 52/32 B DSDG to 480 V Bus DS, Rev. 9

HBR2-7706, Dedicated Shutdown Bus DS Single Line Diagram, Rev. 11

HBR2-7707, Dedicated Shutdown Bus DS Three Line Diagram, Rev. 13

HBR2-8255, Fire Protection System Intake Structure Flow Diagram, Sheet 1, Rev. 12

HBR2-8255, Fire Protection System Intake Structure Flow Diagram, Sheet 2, Rev. 24

HBR2-8606, N2 Supply System Flow Diagram, Rev. 17

HBR2-11448, Crane-Aloyco, Inc. Tilting Disc Check Valve Assembly, Rev. 0

HBR2-11886, Anchor/Darling Valve Company 30"-150# T.D. Check Valve, Bolted Bonn. - Cast Carb. Stl. - Stellite Trim - Butt Weld Ends, Rev 0

G-190196, Main and Extraction Steam System Flow Diagram, Sheet 1, Rev. 49

G-190197, Feedwater Condensate and Air Evacuation System Flow Diagram, Sheet 1, Rev. 47

G-190197, Feedwater Condensate and Air Evacuation System Flow Diagram, Sheet 4, Rev. 47

G-190199, Service & Cooling Water System Flow Diagram, Sheet 1, Rev. 63

G-190199, Service & Cooling Water System Flow Diagram, Sheet 2, Rev. 62

G-190199, Service & Cooling Water System Flow Diagram, Sheet 3, Rev. 29

G-190199, Service & Cooling Water System Flow Diagram, Sheet 4, Rev. 50

G-190199, Service & Cooling Water System Flow Diagram, Sheet 5, Rev. 43

G-190199, Service & Cooling Water System Flow Diagram, Sheet 6, Rev. 39

G-190199, Service & Cooling Water System Flow Diagram, Sheet 7, Rev. 38

G-190199, Service & Cooling Water System Flow Diagram, Sheet 8, Rev. 30

G-190199, Service & Cooling Water System Flow Diagram, Sheet 9, Rev. 51

G-190199, Service & Cooling Water System Flow Diagram, Sheet 10, Rev. 41

G-190199, Service & Cooling Water System Flow Diagram, Sheet 11, Rev. 60

G-190199, Service & Cooling Water System Flow Diagram, Sheet 12, Rev. 40

G-190199, Service & Cooling Water System Flow Diagram, Sheet 13, Rev. 14

G-190200, Instrument and Station Air System flow Diagram, Rev. 30

G-190204-A, EDG System Flow Diagram, Rev. 18

G-190626, Sht. 003, 125 V DC and 120 V Vital AC Single Line, Rev. 11

G-190628, Control Wiring Diagram, Sheet 710, Rev. 21

G-190628, Control Wiring Diagram, Sheet 842, Rev. 14

G-190628, Control Wiring Diagram, Sheet 844A, Rev. 14

G-190628, Control Wiring Diagram, Sheet 844B, Rev. 1

EBASCO Dwg 5379-1581 , Condensate Storage Tank, Rev. 4

EBASCO Dwg. 5379-1555, 15' X 19'6" Storage Tank, Diesel Oil Storage Tank, Rev. 1

EBASCO Dwg. 5379-15556, Diesel Oil Storage Tank Bottom, Rev. 0

11864399, Fuel Tank (275 gal.) Application, Rev. 1

Condition Reports (CRs) and Action Requests (ARs)

AR 00010821, EDG A Blower Lobe Damage, dated 1/28/99

AR 00010822, EDG A Overspeed Trip Adjustment Screw Exceeded Acceptance Criteria, dated 1/28/99

AR 00011162, EDG B Indicating Light and Control Annunciator Switch Failure, dated 3/12/99

AR 00011176, Failure of Vibrometer Fasttrack to Download Test Data for SDAFW Pump Surveillance Test, dated 3/3/99

AR 00011462 Discrepancy Between the UFSAR and TS Bases and the Design Basis Document Regarding Isolation of Service Water to the Turbine Building, dated 4/1/99

AR 00011763 Service Water Valves SW-851 and SW-857 Mispositioned in Closed Position, dated 6/12/99

AR 00011860, AFW SSFI Calculation Review, dated 6/25/99

AR 00011854, CST Level Curve (Curve 8.4) Does Not Indicate the Level Corresponding to the Technical Specification Required Level (ITS 3.7.5) of 35,000 Gallons Available to the AFW Pumps, dated 6/23/99

AR 00011855, Service Water Supply Piping to AFW Pump Suction is not Inspected or Flushed at any Given Frequency, dated 6/24/99

AR 00012001, EDG Alternate DC Supply for Field Flash, dated 7/18/99

AR 00012828 Pinhole Leak in SW System Downstream of Valve SW-740 ("B" CCW Heat Exchanger Outlet Isolation Valve), dated 11/3/99

AR 00023305 Identify Correct Positions for SW-553 and SW-554 (EDG's "A" and "B" Air Dryer Service Water Outlet Valves), dated 9/1/00

AR 00023611 The Preventive Maintenance Program for the Dedicated Shutdown System Does Not Adequately Address all of the Components, dated 9/13/00

AR 00028513, EDBS Usage Rather than Passport, dated 2/16/01

AR 00028517, Admin Inconsistencies in IST Valve Table, dated 2/16/01

- AR 00028518, ISI/IST Do Not Meet Standards of CAP-NGGC-0201, dated 2/16/01
- AR 00028519, Missed Actions Could Affect Ten-Year IST Plan, dated 2/16/01
- AR 00028524 Revise Station Blackout Coping Analysis Report (8S19-P-101) to clarify operability requirements for the Steam Driven Auxiliary Feedwater Pump when the Condensate Storage Tank level is below 34%, dated 2/16/01
- AR 00012455, EDG Adverse Conditions with Support Systems, dated 6/8/01
- CR 98-00048, Following Maintenance on AFW V2-14C, VOTES Testing was Required to Declare the Valve Operable, dated 1/6/98
- CR 98-00062, Maintenance Rule Periodic Assessment (Self Assessment Report RESS 97-37) Corrective Actions Addressing the Monitoring of Unavailability and Functional Failures, dated 2/27/98
- CR 98-00118, Unqualified Steam Trap Lines in the Emergency Feedwater Turbines' Steam Supply System, dated 4/21/98
- CR 98-00253, Resolution and Corrective Actions for Apparent Violations Identified in NRC's Notice of Violations and Inspection Report #50-261/98-03
- CR 98-00907, Erratic Operation of FCV-6416, Feed Regulating Valve for SDAFW Pump, dated 5/15/98
- CR 98-01191, Review of OMM-001-12 Revealed that Minimum CST Inventory was Below Inventory Requirements for Coping with Station Blackout event, dated 6/19/98
- CR 98-01308, FI-6416, SDAFW Pump Flow Indicator, was Found to Have Been Purchased as Non-Q and is Currently Fulfilling a Q role in the AFW System, dated 6/18/98
- CR 98-01990, SDAFW Pump Not Listed as Out of Service in the Special Conditions Section During 50.59 Review due to Differing Interpretations of Requirements, dated 9/16/98
- CR 98-02827, FIC-4616, SDAFW Pump Flow Indicator/Controller, Found Reading Approximately 70GPM with 0 Flow in the Line, dated 12/17/98
- CR 99-00511, SBO Operator Training, dated 3/4/99
- CR 99-01245, AFW SSFI Team Found Several DBD/UFSAR Discrepancies, dated 6/24/99

ARs and Work Orders Written During This Inspection

AR 00043258, Valve found unlocked (valve was in correct position, but was not locked in position as required. Valve is located in Unit 1.)

AR 00043261, Incorrect labeling on electrical drawing.

AR 00043266, Technical Manual 728-626-83 Does Not Reflect the Correct Battery Model

AR 00043916, Calculation No. RNP-E-6.028 Error Delineating Breaker DSDG Feed to DS Bus (52/32 B)

AR 00043930, Failure to record MTE for themorators used to calibrate AMOT valves.

AR 00043934, Failure to update logic diagram in UFSAR.

AR 00043955, Clarification of TS Bases regarding testing of loss of voltage relays.

AR 00043957, Lack of procedures for using EDG emergency field flash battery.

AR 00043958, Drawing HBR2-8664 inconsistent with MOD 546 design conditions

AR 00043993, EDG AMOT valve upper stroke limit not specified in maintenance procedure

PM/ST 2001-084, Preventive Maintenance Revision Request to Work Order Package 00067242-01, due to Incorrect Strainer Tag Numbers, dated 06/18/01

Engineering Service Requests (ESRs)

ESR 9401050, Insulation of Fuel Oil Piping, Rev. 0

ESR 95-00312, EDG Common Cause Failure Determination - EDG A Inoperable, Rev. 0, dated 3/27/95

ESR 95-00317, Common Cause Failure Report - Cracked Piston Ring EDG A, rev. 0, dated 3/27/95

ESR 95-01062, EDG Common Cause Failure Determination - EDG B Inoperable, Rev. 0, dated 10/23/95

ESR 9700363, IN 94-19 Open Issues/EDG Cold Fuel Oil Vulnerability, Rev. 0

ESR 97-00463, DSDG Output Breaker Closure (Engineering Disposition-ED), Rev. 0

ESR 98-00014, Common Cause Failure Determination - EDG B, OST-701-4, Rev. 0, dated 1/10/98

ESR 98-00564, DFOST Instrumentation, Rev. 0

ESR-99-00033, EDG Exhaust Piping Bolting, Rev. 0,

ESR 99-00045, To Replace the DS UPS Battery, Rev. 0, dated 5/9/00

ESR 00-00029, RCP High Temperature Seals, Rev. 0

ESR 00-00066, Nitrogen Supply/Blanketing System, Rev. 0, (5/1/00)

ESR 00-00158, EDG B Fuel Oil Transfer Pump Motor Replacement, Rev. 1

ESR 01-00102, SW Line 6-CW-89 Leak Repair, Rev. 0

NUCLEAR STATION MODIFICATIONS

M-1018, Auxiliary Feedwater - NPSH, Rev. 27

M 1065, DGV Relay Set Point Change, Rev. 1, Dated 8/31/94.

M-1081, Unit 2 Steam Generator PORV Control - N2 Supply, dated 10/14/92

M-1091, FCV 6416, AFW Flow Regulating Valve, Upgrade, Rev. 3

M-1107, Upgrade of Recirculation Lines of AFW Pumps, Rev. 0

ESR 94-00394, Insure Proper Venting of AFW-18 Valve to SDAFW Pump, Rev. 0

ESR 95-00138, Feedwater Branch Connection "C" Reinforcement Replacement, Rev. 0

ESR 95-00796, AFW Self-Cooling, Rev. 0

ESR 97-00040, Provide Modification for MOV Pressure Locking, Rev. 0

Completed Surveillance Procedures, Preventive Maintenance (PM), and Test Records

MST-925, Westinghouse Molded Case Circuit Breakers Thermal and Instantaneous Trips Testing, Rev. 9 (Completed on

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 50 (completed on 05/10/01)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 49 (completed on 03/27/01)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 48 (completed on 01/02/01)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 47 (completed on 07/18/00, 10/11/00)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 46 (completed on 07/25/00)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 45 (completed on 01/08/00, 02/01/00)

OST-202, Steam Driven Auxiliary Feedwater System Component Test, Rev. 44 (completed on 11/09/99, 11/11/99)

OST-202, Steam Driven Auxiliary Feedwater System Component Test (Monthly or Within 24 Hours of Achieving Stable Plant Conditions at ≥ 1000 psig in the S/G Following Plant Heatup), Rev. 43 (completed on 03/03/99, 05/25/99, 08/18/99, 08/20/99, 10/23/99)

OST-206, Steam Driven Auxiliary Feedwater Pump Flow Test (Prior to Shutdown to Cold Shutdown, or at Power Following Each Cold Shutdown If Not Performed Within the Previous 92 Days or Prior to Exceeding 5% Reactor Power (Mode 1) When the Unit Has Been in Cold Shutdown (Mode 5 or 6) for Greater than 30 Days), Rev. 31 (completed on 09/08/99)

OST-206, Steam Driven Auxiliary Feedwater Pump Flow Test (Prior to Shutdown to Cold Shutdown, or at Power Following Each Cold Shutdown If Not Performed Within the Previous 92 Days or Prior to Exceeding 5% Reactor Power (Mode 1) When the Unit Has Been in Cold Shutdown (Mode 5 or 6) for Greater than 30 Days), Rev. 33 (completed on 05/14/01)

OST-401-2, EDG B Slow Speed Start, Rev. 15, (completed on 5/30/01)

OST 402-2, EDG B Diesel Fuel Oils System Flow Test, Rev. 15, (completed on 5/13/01)

OST-603, Motor Driven Fire Pump and Engine Driven Fire Pump Test (Weekly), Rev. 21 (Completed on 5/13/01, 5/19/01, 5/27/01, & 6/3/01)

OST-646, Fire Suppression Water System Engine Driven Fire Pump Test (Annual), Rev. 11 (Completed on 8/24/98)

OST-646, Fire Suppression Water System Engine Driven Fire Pump Test (Annual), Rev. 13 (Completed on 7/22/99)

OST-646, Fire Suppression Water System Engine Driven Fire Pump Test (Annual), Rev. 14
(Completed on 6/23/00)

OST-910, DSDG (Monthly), Rev. 25 (completed 5/11/01)

PIC 804, ABB Type 27N Electronic Undervoltage Relay, Revision 11 (completed on 4/19/01)

PIC 805, Westinghouse Type CV-7 Undervoltage Relay, Revision 10 (completed on 4/19/01)

PM-435, Breaker Data Sheet 52/32 A (completed on 8/25/97 and 2/16/99)

PM-435, Breaker Data Sheet 52/32 B (completed on 8/25/97 and 2/17/99)

PM-435, Breaker Data Sheet 52/33 B (completed on 8/28/97 and 3/13/99)

PM-435, Breaker Data Sheet 52/34 C (completed on 8/27/97 and 1/21/99)

TMM-035, Dynamic Post Test Evaluation of Butterfly MOVs, Rev. 16 (completed on V6-16C in
October, 1999)

Completed Work Requests (WR/JO) and Work Orders (WO)

WR/ JO ANWY 001, PM for Inspection and Cleaning of DS Main Transformer

WR/JO AKET 001, Replace the Thermostatic Elements in the B EDG AMOT Valves, dated
3/11/99

WR/JOs on Steam Traps - ALAR 001 (completed on 03/26/98), ALAR 002 (completed on
09/29/99), 99-ACXZ1 (completed on 02/00), 96-AFXU1 (completed on 02/97), 95-AITQ1
(completed on 10/95), 94-AJTY3 (completed on 06/95), 94-ABFZ1 (completed on 03/94),
92-AQCN2 (completed on 10/93), 92-AQCN1 (completed on 10/93)

WR/JO ALAT 002, SDAFW Pump Governor (completed on 09/99)

WR/JOs on AFW-V2-14A, Feed Regulating Valve - AAPI 006 (completed on 10/00), AAGP 002
(completed on 05/99), AAPI 005 (completed on 11/99), 97-AEIP5 (completed on 04/98),
97-AEIP4 (completed on 03/98), 94-AEIP2 (completed on 03/98)

WR/JOs on AFW-V2-14B, Feed Regulating Valve - AAPJ 005 (completed on 04/00), AAGQ
002 (completed on 11/99), APJ 004 (completed on 05/99), 97-AEIQ2 (completed on 03/98),
97-AEIQ4 (completed on 03/98)

WR/JOs on AFW-V2-14C, Feed Regulating Valve - AAPK 006 (completed on 10/00), AAPK
005 (completed on 11/99), AGR 002 (completed on 08/99), 97-AEIR4 (completed on 01/98),
97-AFXQ2 (completed on 04/98)

WR/JOs on FCV-4616, Flow Control Valve - AIMM 006 (completed on 05/00), ABLX 002 (completed on 07/00), AIMM 005 (completed on 06/99), 00-ADNC1 (completed on 10/00)

WR/JO 99-ACNG1, SDAFW Pump Strainer, (completed on 08/99)

Technical Services Report 2001-0368, SDAFW Pump Bearing Oil Analysis (completed on 03/27/01)

WO 00054779, Inspection and Testing of 52/32 A- Normal Feed From SST 2C

WO 00055773, Inspection and Testing of 52/32 B- Alternate Feed From DS Diesel Generator

WO 00058006-01, Remove, Inspect and Install the Suction Strainer on the Steam Driven AFW Pump per CM-008

WO 00065024-01, Calibrate the 480 Volt Bus E-1 Loss of Voltage and Over Current Relays. 27/DVA-1, 27/DVB-1, 27/DVC-1, 271/E1, and 272/E1, dated 3/30/01.

WO 00065102-01, Calibrate the 480 Volt Bus E-2 Loss of Voltage and Over Current Relays. 27/DVA-2, 27/DVB-2, 27/DVC-2, 271/E-2, 272/E2, dated April 3, 2001.

WO 00066055-01, Perform Grease Inspection on AFW-V2-14B per PM-112 (completed on 03/01)

WO 00066098-01, Calibrate the SDAFW Pump Flow Transmitter FT-6416 and Valve Positioner FCV-6416-HO (completed on 03/01)

WO 00066149-01, Calibrate Fuel Oil Storage Tank Level Switch LIS-1966, dated 6/13/01

WO 00067242-01, Disassemble, Inspect, and Repair T1-1, T1-2, S-27, S-28, S-29 and S-30 (Steam Traps and Strainers on SDAFW Steam Supply Line) (completed on 04/18/01)

WO 00068027-01 Reactor Coolant Pump "C" Seal Replacement

WO 00068032-01 Reactor Coolant Pump "B" Seal Replacement

WO 00068361-01, Obtain Oil Sample and Change Oil on the SDAFW Pump Governor, (completed in April, 2001)

SELF-ASSESSMENTS

RESS 98-03, RNP EDG SSFI

ESS 99-52, Auxiliary Feedwater (AFW) Safety System Functional Inspection

ESS 99-53, Maintenance Rule (a) (3) Periodic Assessment

ESS 99-93, Station Blackout Program Implementation at RNR

R-ES-99-01, Inservice Inspection, Inservice Testing, and Station Blackout Programs

CES 99-014, Transmission Activities Interface

R-ES-01-01, RNP ISI/IST/SBO Assessment Report

15232, Emergency Diesel Generator Support Systems

15257, Dedicated Shutdown Electrical Distribution System

OPERATING EXPERIENCE EVALUATION

Serial # 6744, Unqualified Steam Trap Lines in the Emergency Feedwater Turbines' Steam Supply Systems, OE 8581 (dated 10/08/97)

Serial #7230, Stem Binding in Turbine Governor Valves in Reactor Core Isolation Cooling (RCIC) and Auxiliary Feedwater (AFW) Systems, IN 98-24

Serial # H-4451, H-3838, Overspeed of Turbine Driven Pumps Caused by Governor Valve Stem Binding, IN 94-66

Serial #7121, Design Deficiency Related to Inadequate Runout Protection for the Turbine Driven AFW Pump, HLER 98-004 (dated 04/13/98)

Indian Point 2 - 2000-14, Auxiliary Feedwater (AFW) Regulating Valves Disc Potential for Clogging (dated 01/30/01)

Auxiliary Feedwater System Declared Inoperable due to Elevated Suction Source Water Temperature, OE 8997 (dated 05/08/98)

Design Criteria

Design Basis Document DBD/R87038/SD05, Emergency Diesel Generator System, Rev. 0

Design Basis Document DBD/R87038/SD16, Electrical Power Distribution System, Rev. 2

Design Basis Document, DBD/R87038/SD32, Auxiliary Feedwater System, Rev. 6

UFSAR

Section 8.0, Electrical Power Systems

Section 8.3, Onsite Power Systems

Technical Specifications (TS)

TS Section 3.3.8.1, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

TS Section 3.8, Electrical Power Systems

Miscellaneous Documents

Harco Technologies Corporation - Post Repair Evaluation Report Cathodic Protection System Unit No. 2 Underground Fuel System Piping, January 1993

Harco Technologies Resurvey Report Cathodic Protection System Unit No. 1 and 2 Underground Fuel System Piping H. B. Robinson Plant, September 1996

Pacific Steam Turbo Pumps Vendor Technical Manual, Technical Manual for SD AFW Pump (Type TBA-16)

Raytheon Engineers & Constructors Corrosion/Cathodic Protection Assessment Report for the Shearon Harris, Brunswick and H. B. Robinson Nuclear Power Plants, October 1996

Woodward Governor Company Vendor Technical Manual, Technical Manual for SD AFW Pump Governor (Type UG40PL)

Vendor Tech Manual TM 728-151-60, Westinghouse 480 V AC Distribution System Switch Gear- Indoor Low Voltage Switch Gear and Diesel Generator Control Panel

Vendor Tech Manual TM 728-523-20, Westinghouse 480 V AC Distribution System - Breakers 480 V, MCC Westinghouse, Section 12

Vendor Tech Manual TM 728-626-83, Pacs Ind. & Morrison Knudsen Power Systems- DSDG Control Panel and Generating Units Operating Manual

Vendor Reference Manual, CP&L Stock Number 728-652-56, Cathodic Protection

Certified Performance Test, Job # QB-6527, Service Water Pump D Performance Curve

Induction Motor Starting Characteristics at 100%, 90 % and 80 % Line Voltage, Calculation RNP-E-2.0007, Attachment B.

Ventilation Test Report, Fan Data Sheet, Systems Testing and Balancing Inc., System HVS-6,

NUMARC 87-00 Guidelines and Technical Bases for NUMARC Initiatives, Rev. 1

System Health Report for Dedicated Shutdown Diesel Generator (dated 1/29/01)

Robinson Nuclear Project - Review for SBO Impact (Attachment 6.3- Screening Criteria)

NED Document CALC-MATRIX- EDS and Cable Raceway System Calculation Summary Index
(File No. N107-543-XXX-XXX-R)

Design Basis Differential Pressure Report for the MOVs in the Main Steam System, DP-025,Rev.2

Station Blackout Coping Analysis Report 8S19-P-101, Rev. 5

Licensee Event Report LER 83-016, Steam Binding of SDAFW Pump, dated 08/19/83
Vendor Manual 729-063-16, Colt Industries, Fairbanks Morse Diesel Generator Products,
dated 6/14/00, rev. 55

EBASCO Specification for EDG, Robinson Steam Electric Plant, Purchase Specification,
CPL-R2-MD-6, dated 7/12/67

Job Performance Measure, JPM IP-114, Transfer Steam Line PORV Control at the Secondary
Control Panel IAW EPP-1, Attachment 1, rev. 3

SD-005, Emergency Diesel Generators System Description, Rev. 3, dated 2/24/00

SD-018, Nitrogen and Hydrogen System Description, Rev. 0, (4/4/96)

SD-042, Auxiliary Feedwater System Description, Rev. 3

SD-056, Dedicated Shutdown System, TSC/EOF/PAP, Diesel Generator System Description,
Rev. 1

SD AFW Pump Performance Trend and Data Sheets

DS-DBD-1 Dedicated Shutdown Electrical Distribution System- NUS Input to DBD Document,
Rev. 0

Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 161
to Facility Operating License No. DPR-23, Caroline Power and Light Company,
H. B. Robinson Steam Electric Plant, Unit No. 2, Docket No. 50-261.