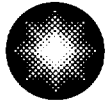


**NMP#2 SAMPLE PLAN REVIEW COMMENTS for 7/29/02 EXAM**

- SRO, admin A.4, develop a table top detailed scenario to classify the event and determine PAR recommendations rather than just taking credit for classifying the event immediately following the scenarios.
- Replace JPM to transfer from 3 element to 1 element control FWLC system. Too simplistic for making a licensing decision.
- Scenario #1 which currently designated as the alternate Event #3 appears to be redundant to admin JPM SRO A.1.2. This may also be redundant to some proposed written exam items. Licensee was aware and will replace this item. Also on this scenario licensee will modify success path at the end of the scenario to allow last two rods to be driven into core after RX B/D.
- On the SRO written exam outline just cautioned licensee that there are currently 12 proposed "SRO only" question topics that could be RO level of knowledge depending on how the questions are written. For example, ability to recognize AOP and EOP entry level conditions.



**Constellation  
Nuclear**

**Nine Mile Point  
Nuclear Station**

*A Member of the  
Constellation Energy Group*

May 7, 2002  
NMP-97923

Mr. Hubert J. Miller  
Regional Administrator  
USNRC Region I  
475 Allendale Road  
King of Prussia, PA 19406

ATTENTION: Mr. John Caruso

SUBJECT: NINE MILE POINT UNIT 2 INITIAL OPERATOR EXAMINATION OUTLINE  
SUBMITTAL

Mr. Miller:

In response to the NRC Corporate Notification Letter dated April 1, 2002, arrangements were made for the administration of licensing examinations at Nine Mile Point, Unit 2 during the week of July 29, 2002. The examinations are being prepared based on the guidelines in Revision 8, Supplement 1, of NUREG 1021, "Operator Licensing Examination Standards for Power Reactors." To meet the examination schedule, Nine Mile Point Nuclear Station is required to furnish the examination outlines by May 13, 2002. Enclosed are the following examination outline documents:

- ES-201-2, Examination Outline Quality Checklist
- ES-401-1 and 401-5, BWR SRO Examination Outline and Generic Knowledge and Abilities Outline
- ES-401-2 and 401-5, BWR RO Examination Outline and Generic Knowledge and Abilities Outline
- ES-401-10, Record of Rejected K/As
- ES-301-1, Administrative Topics Outline (2)
- ES-301-2, Control Room Systems and Facility Walkthrough Test Outlines (3)
- ES-301-3, Operating Test Quality Checklist
- ES-301-4, Simulator Scenario Quality Checklist
- ES-301-5, Transient and Event Checklist (6)
- ES-301-6, Competencies Checklist (4)
- ES-D-1, Scenario Outline (4)
- Preliminary Exam Week Schedule (proposed)

Please withhold these examination materials from public disclosure until after the examinations have been completed.

Nine Mile Point Nuclear Station has used an industry standard and widely available commercial product to develop the exam outlines. The written exam outlines for the Nine Mile Point Unit 2 RO and SRO exams were randomly generated, as required by ES-401, by WD Associates, utilizing the BWR Owners Group sponsored "BWR K/A CATALOG Version 1.07" Test Outline Generator Program. This software program was developed by WD Associates, for randomly generating written exam outlines.

The following K/A statements were not included in the random generation process, as allowed by ES-401, D.1.b:

- K/A Catalog was pre-screened prior to random outline generation. Non applicable system K/A statements were manually suppressed. Enclosed in the outline submittal package is a marked up K/A Catalog, identifying the K/A statements that were excluded.
- All K/A statements with an importance rating of below 2.5 were pre-screened by the software program during the random outline generation process.
- Generic K/A statements for which it is not possible to develop Tier 1 and Tier 2 system/evolution questions were pre-screened.

The random outline was generated for both the RO and SRO written exams. The program randomly selected 27 SRO only K/A topics per NUREG 1021, Rev. 8, Supplement 1, from the facility specific K/A Catalog database. The program next randomly selected the remaining 73 K/A topics to satisfy the SRO exam requirements. These test items are common to both the RO and SRO outlines. These 73 common K/A topics were then inserted into the RO outline, followed by the remaining 27 RO K/A topics. The random generation process did not result in the necessity to replace any K/A statements that can result when the software program generates the RO and SRO outlines together. These outlines were then saved with password protection for exam material development.

If you have any questions regarding the examination outline submittal, please contact Mr. Jerry Bobka (Facility Contact) at 315-349-2569 or Mr. Bob Magnant (Initial Training Supervisor) at 315-349-1375.

Sincerely,



Louis E. Pisano  
Manager Nuclear Training

LEP/crr

Facility: Nine Mile Point # 2  
 Examination Level (circle one): **RO**

Date of Examination: July 29, 2002  
 Operating Test Number: 1

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Plant Parameter Verification	JPM - Line up the Containment Monitoring system to determine Containment water level above the 224 foot elevation. (EOP-6, Attachment 23)  K/A's 2.1.7 (3.7) 2.1.20 (4.3) 2.1.31 (4.2) Task J223-959-04-01-2
	Fuel Handling	JPM - Given indications in the Control Room of an inadvertent criticality during fuel movement activities, perform appropriate steps. (SOP-39, EPIP-21, EPIP-5A, EPIP-18)  K/A's 2.4.4 (4.0) 2.1.7 (3.7) Task J200-016-05-01-2
A.2	Tagging and Clearances	JPM - Given a completed "Clearance Request Form", blank "Clearance Sheet" and "Tag List" and access to the appropriate reference material, develop a clearance boundary.  K/A 2.2.13 (3.6) Task J299-902-03-50-3
A.3	Radiation Work Permit	Question - Given a specified survey map, identify radiological hazards.  K/A 2.3.10 (2.9)
		Question - While walking through the Plant next to a high radiation area you see a leak that can be isolated by reaching over the barrier rope and closing the valve. What are the requirements for doing this?  K/A's 2.3.4 (2.5) 2.3.10 (2.9)
A.4	Emergency Protective Action Recommendations	JPM - Perform the actions required when notified of an injured and contaminated person in the Plant. (EPIP-EPP-04)  K/A's 2.4.12 (3.4) 2.4.39 (3.3) Task J200-921-05-01-2

Facility: <u>Nine Mile Point # 2</u>		Date of Examination: <u>July 29, 2002</u>
Examination Level (circle one): <b>SRO</b>		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Reactor Plant Startup Requirements	JPM - Given GAP-CHE-01 BWR Water Chemistry Limits and "Action Level 1" values exceeded for CDI conductivity, determine and make the appropriate notifications.  K/A 2.1.34 (2.9) Task J341-022-03-03-2
	Plant Parameter Verification	JPM - Given Jet Pump flow readings, determine condition of Recirculation Loops operating. (N2-OSP-LOG-D001, Attachment 8)  K/A 2.1.7 (4.4) Task J202-905-04-03-2
A.2	Surveillance Testing	JPM - Given a completed surveillance test and appropriate results ensure test and results comply with specifications and requirements.  K/A's 2.2.12 (3.4) 2.2.24 (3.8) Task J341-012-01-03-2
A.3	Control of Radiation Release	JPM - Given a Radwaste Tank Discharge to Lake Ontario permit and N2-CSP-LWS-@201, perform steps required to approve the discharge.  K/A's 2.3.11 (3.2) 2.3.6 (3.1) Task J341-012-03-03-2
A.4	Emergency Classification	JPM - Emergency Plan classification of each SRO candidates scenario. (Submitted with and to be administered after each scenario).  K/A's 2.4.29 (4.0) 2.4.41 (4.1)

Facility: Nine Mile Point # 2  
 Exam Level (circle one): RO & SRO

Date of Examination: 7/29/2002  
 Operating Test No.: RO 1,2/SRO-I All

**B.1 Control Room Systems**

System / JPM Title	Type Code*	Safety Function
<b>JPM 1 Recirc Flow Control/</b> Transfer Operating RCS HPU Subloops KA 202002 A4.02 2.8/2.8; Task 202-907-01-01; N2-OP-29 F.2.0	S/N	1
<b>JPM 2 Feedwater Level Control/</b> Transfer FWLC From 1 Element to 3 Element Control (O2-OPS-SJE-259-2-05) KA 259002 A4.03 3.8/3.6, A4.06 3.1/3.2; Task 259-007-01-01; N2-OP-3 F.8.2	S/D/L	2
<b>JPM 3 High Pressure Core Spray/</b> Add Water To Suppression Pool With CSH Pump (Alternate Path) CSH Pump Trip Continue Filling By Gravity Drain KA 209002 A4.09 3.4/3.5; Tasks 206-907-01-01, 206-906-01-01; N2-OP-33	S/N/A	3
<b>JPM 4 Reactor Water Cleanup &amp; PCIS/</b> Return Reactor Water Cleanup To Normal Following Reduction Of Feedwater Stratification Operation (Alternate Path, WCS Leak Requires Manual Isolation) KA 223002 A2.03 3.0/3.3; Task 204-911-01-01; N2-OP-37 F.7.0, N2-SOP-83	S/N/L/A	2
<b>JPM 5 Reactor Protection System/</b> Perform RPS Weekly Manual Scram Surveillance Test For "C" And "B" Channels KA 212000 A4.02 3.6/3.7; Task 212-002-01-01; N2-OSP-RPS-W002	S/N	7
<b>JPM 6 RCIC/</b> RCIC Injection With Oscillations Alternate Path, Requires Manual Speed/Flow Control (O2-OPS-SJE-217-2-05) KA 217000 A4.01 3.7/3.7; Task 217-915-01-01; N2-OP-35	S/D/A	4
<b>JPM 7 AC Distribution/</b> Energize NNS-SWG-015 from ENS*SWG103 During Station Blackout Recovery (PRA) KA 262001 A2.07 3.0/3.2; Task 262-935-05-01; N2-SOP-3 Section D.10.0	S/N	6

**B.2 Facility Walk-Through**

<b>JPM 8 AC Distribution RPS/</b> Reset EPA Breaker 2VBS*ACB2A With Overvoltage Condition Present (Alternate Path) KA 262001 A2.06 2.7/2.9; Task 212-901-01-04; N2-SOP-97 Section 4.2.3 Condition One	N/A	6
<b>JPM 9 Control Rod Drive/Vent</b> Scram Air Header in the Reactor Building (O2-OPS-PJE-200-2-04) KA 201001 A2.09 3.2/3.1; Task 200-960-05-04; N2-EOP-6 Att 14 Step 3.2.2	D/R	1
<b>JPM 10 Spent Fuel Pool Cooling/</b> Lineup Service Water To Spent Fuel Pool Cooling Heat Exchanger With Control Room Evacuated KA 233000 A2.08 2.9/3.1; Task 233-923-04-01; N2-SOP-38 Section 4.5	N/R	9

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Nine Mile Point # 2  
Exam Level (circle one): SRO

Date of Examination: 7/29/2002  
Operating Test No.: SRO Upgrade 1 & 2

**B.1 Control Room Systems**

System / JPM Title	Type Code*	Safety Function
<b>JPM 1 Recirc Flow Control/</b> Transfer Operating RCS HPU Subloops KA 202002 A4.02 2.8/2.8; Task 202-907-01-01; N2-OP-29 F.2.0	S/N	1
<b>JPM 2 Feedwater Level Control/</b> Transfer FWLC From 1 Element to 3 Element Control (O2-OPS-SJE-259-2-05) KA 259002 A4.03 3.8/3.6, A4.06 3.1/3.2; Task 259-007-01-01; N2-OP-3 F.8.2	S/D/L	2
<b>JPM 3 High Pressure Core Spray/</b> Add Water To Suppression Pool With CSH Pump (Alternate Path) CSH Pump Trip Continue Filling By Gravity Drain KA 209002 A4.09 3.4/3.5; Tasks 206-907-01-01, 206-906-01-01; N2-OP-33	S/N/A	3

**B.2 Facility Walk-Through**

<b>JPM 8 AC Distribution RPS/</b> Reset EPA Breaker 2VBS*ACB2A With Overvoltage Condition Present (Alternate Path) KA 262001 A2.06 2.7/2.9; Task 212-901-01-04; N2-SOP-97 Section 4.2.3 Condition One	M/A	6
<b>JPM 10 Spent Fuel Pool Cooling/</b> Lineup Service Water To Spent Fuel Pool Cooling Heat Exchanger With Control Room Evacuated KA 233000 A2.08 2.9/3.1; Task 233-923-04-01; N2-SOP-38 Section 4.5	N/R	9

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA

Facility: Nine Mile Point # 2  
Exam Level (circle one): SRO

Date of Examination: 7/29/2002  
Operating Test No.: SRO Upgrade 3

**B.1 Control Room Systems**

System / JPM Title	Type Code*	Safety Function
<b>JPM 4 Reactor Water Cleanup &amp; PCIS/</b> Return Reactor Water Cleanup To Normal Following Reduction Of Feedwater Stratification Operation (Alternate Path, WCS Leak Requires Manual Isolation) KA 223002 A2.03 3.0/3.3; Task 204-911-01-01; N2-OP-37 F.7.0, N2-SOP-83	S/N/L/A	2
<b>JPM 5 Reactor Protection System/</b> Perform RPS Weekly Manual Scram Surveillance Test For "C" And "B" Channels KA 212000 A4.02 3.6/3.7; Task 212-002-01-01; N2-OSP-RPS-W002	S/N	7
<b>JPM 6 RCIC/</b> RCIC Injection With Oscillations Alternate Path, Requires Manual Speed/Flow Control (O2-OPS-SJE-217-2-05) KA 217000 A4.01 3.7/3.7; Task 217-915-01-01; N2-OP-35	S/D/A	4

**B.2 Facility Walk-Through**

<b>JPM 9 Control Rod Drive/Vent</b> Scram Air Header in the Reactor Building (O2-OPS-PJE-200-2-04) KA 201001 A2.09 3.2/3.1; Task 200-960-05-04; N2-EOP-6 Att 14 Step 3.2.2	D/R	1
<b>JPM 10 Spent Fuel Pool Cooling/</b> Lineup Service Water To Spent Fuel Pool Cooling Heat Exchanger With Control Room Evacuated KA 233000 A2.08 2.9/3.1; Task 233-923-04-01; N2-SOP-38 Section 4.5	N/R	9

\* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA



Nine Mile Point 2		Scenario No. 1 (Alternate)		Operating Test No. 1	
Examiners:			Candidates:		
<p><b>Objectives:</b> Evaluate candidates ability to perform routine operating tasks using normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications. The candidates will respond to the following events:</p> <ol style="list-style-type: none"> <li>1. Single control rod scram and recovery</li> <li>2. Rams Head separates from the Riser on Jet Pumps 3 and 4, and</li> <li>3. EHC Pressure Transmitter fails upscale, and</li> <li>4. Small LOCA with drywell vacuum breakers stuck open, and</li> <li>5. Normal Containment Spray flowpath is not available.</li> </ol> <p>This scenario will be classified as an ALERT (EAL 3.1.1)</p>					
<p><b>Initial Conditions:</b></p> <ol style="list-style-type: none"> <li>1. Plant is operating at 100% power, day 128. (IC-20)</li> <li>2. "A" RHR Loop of out of service to repair minimum flow valve.</li> <li>3. Inboard Drywell to Suppression Chamber Vacuum Breaker ISC*RV*34A is failed open.</li> </ol>					
<p><b>Turnover:</b></p> <ol style="list-style-type: none"> <li>1. The Plant is operating at 100% power.</li> <li>2. Transfer RPS "A" to alternate and shutdown RPM MG "A" per N2-OP-97, Section G.2.0. This is being done to facilitate maintenance on the motor.</li> <li>3. "A" RHR Loop out of service for work on the minimum flow valve. Expected to be returned to service for testing in two (2) days. Seven day LCO on T.S. 3.5.1.A, 3.6.1.6.A, 3.6.2.3.A, and 3.6.2.4.</li> <li>4. Inboard Drywell to Suppression Chamber Vacuum Breaker ISC*RV*34A is inoperable due to failure in the partially open position. TS 3.6.1.7 Required Action B.1. Sixty (60) hours remaining on LCO clock.</li> </ol>					
Event No.	Malf. No.	Type	Event Description		
1		N	(BOP/SRO) Transfer RPS "A" to alternate and shutdown RPM MG "A" per N2-OP-97		
2	RD09 5431X	C	(RO) Single Rod Scram during RPS power supply transfer and recovery.		
3	RR18	C	(BOP/SRO) Jet Pump failure "A" Loop. (Plant Shutdown, Mode 3 in 12 hours, T.S. 3.4.3)		

4		R	(RO) Reduce Reactor Power (N2-OP-101C)
5	TC01A	I	(RO) EHC System pressure regulator fails high.
6	RR20 and PC10B	M	(RO/SRO) Small LOCA (8% over 5 minutes), with loss of pressure suppression function due to a Drywell vacuum breaker pair failing open.
7	RH18B or RH01B	C	(BOP/SRO) "B" RHR pump suction strainer clogged. (Spray Containment with RHR Service Water per EOP-6 Attachment 5.) OR Trip of the "B" RHR pump if shift decides to leave the pump running with the cavitation and opens the Drywell Spray valves.

### Scenario 1 - Description Summary

#### SINGLE ROD SCRAM/JET PUMP FAILURE/SMALL LOCA WITH LOSS OF PRESSURE SUPPRESSION/CONTAINMENT SPRAY WITH SERVICE WATER SYSTEM

The scenario begins with the plant operating at rated power. RHR System "A" is out of service for maintenance. An Inboard Drywell to Suppression Chamber Vacuum Breaker is inoperable (open). The crew will perform a planned transfer of RPS "A" electrical power supplies. During the transfer, a single control rod will scram due to a blown fuse on RPS "B" scram pilot valve solenoid. The crew will enter N2-SOP-08 for the unexpected power change and reduce generator MW electric. The crew will restore the control rod to the fully withdrawn position.

When conditions have stabilized, the Rams Head for a Jet Pump pair will separate. The crew will diagnose the jet pump failure based on plant parameter changes. Tech Specs will be entered and a required plant shutdown will be initiated.

During the power reduction, a malfunction in the EHC pressure regulator system causes a rapid reduction in reactor pressure. The crew will enter N2-SOP-23 and manually scram the reactor and close the MSIVs to stabilize reactor pressure and execute N2-EOP-RPV.

After reactor level and pressure are stabilized, the second vacuum breaker in the pair of Drywell to Suppression Chamber Vacuum Breakers will fail open concurrent with small leak from the Reactor Coolant System piping. The vacuum breaker failure results in a loss of Pressure Suppression function within the Primary Containment. As Drywell pressure slowly rises, the crew will execute N2-EOP-PC to control reactor vessel and primary containment parameters. After initiating containment sprays using RHR System "B", the ECCS suction strainer will gradually become clogged with debris in the Suppression Pool. Strainer plugging will require the crew to use an alternate source of containment spray, such as the Service Water System cross-tie to RHR System "B" in order to prevent exceeding Pressure Suppression Pressure Limit (PSP). The use of Service Water for containment spray will be successful in mitigating further degradation of the primary containment.

Major Procedures: N2-SOP-08, N2-SOP-23, N2-SOP-101C, N2-EOP-RPV, N2-EOP-PC, N2-EOP-6 Attachment 5.

EAL Classification: ALERT 3.1.1

Termination Criteria: Reactor is shutdown with RPV Level and Pressure controlled in the directed band. Drywell pressure is lowering as a result of Containment Spray with Service Water and PSP has not been exceeded.

<b>Nine Mile Point 2</b>		<b>Scenario No. 2</b>		<b>Operating Test No. 1</b>	
<b>Examiners:</b>			<b>Candidates:</b> SRO: SRO-I5 RO: SRO-I3 BOP:		
<b>Objectives:</b> Evaluate candidates ability to perform routine operating tasks using normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications. The candidates will respond to the following events: <ol style="list-style-type: none"> <li>1. CRD pump trip</li> <li>2. Recirculation FCV fail to full open position</li> <li>3. RCIC steam leak in Reactor Building with a failure to isolate</li> <li>4. Control rods fail to fully insert on a valid scram signal.</li> </ol> This scenario will be classified as a SITE AREA EMERGENCY (EAL 4.1.1)					
<b>Initial Conditions:</b> <ol style="list-style-type: none"> <li>1. Reactor Startup in progress, currently at 50% reactor power and 80-100% rod line.</li> <li>2. N2-OP-8 Section E, step 4.0 is being used to start the third 4<sup>th</sup> Point Heater Drain pump and place it pumping forward.</li> </ol>					
<b>Turnover:</b> <ol style="list-style-type: none"> <li>1. Currently the Plant is at 50% reactor power and 80-100% rod line.</li> <li>2. Continue Plant startup (N2-OP-101D, Section E, step 1.10), and place the third 4<sup>th</sup> Point Heater Drain pump in service and start pumping forward per N2-OP-8, Section E, step 4.0.</li> </ol>					
Event No.	Malf. No.	Type	Event Description		
1		N	(BOP/SRO) Start HDL Pump 3 for pumping forward per N2-OP-8.		
2	RD12A	C	(RO) "A" CRD pump trip - Electrical fault		
3		R	(RO) Raise Reactor Power to 70-75% using Reactor Recirculation FCVs.		
4	RR49A	C	(RO/SRO) Recirculation FCV position indication failure causes FCV to open. (T.S. 3.4.1 Loop Flow Mismatch.) <i>DER 2-2000-3775</i>		
5	Overrides		(SRO) MCC 302 Feeder Breaker to ICS*MOV128 trips open, (T.S. 3.6.1.3 Primary Containment Isolation Valve Inoperable).		
6	RC12, RC11 RX01	M	(BOP/RO/SRO) RCIC Steam Leak with RCIC Failure to Isolate requiring a manual scram. Minor Fuel Failure (3% over 2 minutes following scram)		

7	RD17A RD07	C	(RO/BOP/SRO) One Group of 12 Control Rods stuck at position 04 and power < 4%. Emergency Blowdown is required due to high Reactor Building temperatures.
8	AD08C	C	(BOP/SRO) ADS/SRV PSV 126 fails to open during Emergency Blowdown due to Loss of N <sub>2</sub> supply.

## Scenario 2 - Description Summary

### CRD PUMP TRIP/RCS FCV FAILURE/RCIC STEAM LEAK WITH STUCK RODS

The scenario begins at 50% power during power ascension. The crew will continue the plant startup using normal operating procedures. Heater Drain Pumps will be lined up to pump forward prior to raising power.

The operating Control Rod Drive Pump will trip due to an electrical fault. The crew will implement the required actions of N2-SOP-30 and start the standby Control Rod Drive Pump. The crew will commence power ascension by raising Recirc Flow System (RCS). As power is being raised, the RCS Flow Control Valve will experience a failure of the valve position components (RVDT) which results in an uncontrolled ramping open of the FCV. The operator will implement the actions of N2-SOP-08 to stop the valve motion by tripping the Hydraulic Power Unit (HPU). The power excursion results in a small amount of fuel failure, which results in elevated radiation levels later in the scenario. Tech Spec entry is required due to the RCS Loop Flow mismatch.

When conditions are stable, the circuit breaker for RCIC Steam Line Isolation valve trips open. This results in Primary Containment Isolation Valve inoperability. The crew will investigate the breaker trip. A steam leak will develop on the RCIC steam piping resulting in a rise in Reactor Building temperatures. When the high temperature isolation setpoint is exceeded the crew will enter and execute N2-EOP-SC. A failure in the RCIC isolation circuit prevents manual and automatic isolation of the leaking steam line. The crew will be required to manually initiate a reactor scram, based on the rising Reactor Building temperature. A group of 12 control rods will fail to fully insert, but the reactor will be shutdown (with power below 4 %). The crew will continue attempts to isolate the steam line and monitor the rising temperatures and radiation levels in the Reactor Building. When more than one area temperature exceeds 212°F, the crew is required to perform an Emergency Blowdown per N2-EOP-C2. The Blowdown is complicated by the post scram control rod positions and the inability to open all seven ADS valves.

Major Procedures: N2-SOP-08, N2-EOP-RPV, N2-EOP-SC, and N2-EOP-C2.

EAL Classification: SITE AREA EMERGENCY (EAL 4.1.1)

Termination Criteria: RPV Emergency Blowdown is completed. Reactor Building temperatures are lowering.

Nine Mile Point 2		Scenario No. 3		Operating Test No. 1	
Examiners:			Candidates: SRO: SRO-I1, SRO-I2, SRO-I4, SRO-U3 RO: RO-1, RO-2 SRO-I5 BOP: SRO-U1, SRO-U2		
<b>Objectives:</b> Evaluate candidates ability to perform routine operating tasks using normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications. The candidates will respond to the following events:					
1. APRM #2 fails upscale 2. Standby Gas Train "B" Fan trip during testing. 3. Emergency Shutdown of Reactor Feedwater Pump "B". 4. Reserve Transformer "A" high temperature. 5. Trip of Reserve Transformer "A" with Diesel Generator failure. 6. Small LOCA with concurrent Loss of Feedwater. This scenario will be classified as an ALERT (EAL 3.1.1)					
<b>Initial Conditions:</b>					
1. 100% Power Above 100% Rod Line (IC-20) 2. RCIC is out of service					
<b>Turnover:</b>					
1. 100% Power Above 100% Rod Line 2. MFLCPR is 0.95 3. Feedwater Pump "B" seal leakage has been rising over the last several shifts and was last noted at about a pencil sized stream. 4. Unidentified Drywell leakage has risen about 0.3 gpm in the last 24 hours. 5. RCIC was removed from service 8 hours ago 6. Perform Monthly 10 hour run surveillance for Standby Gas Train "B".					
Event No.	Malf. No.	Type	Event Description		
1		N	(BOP/SRO) Standby Gas Train "B" 10 hour run surveillance		
2	NM11B	I	(RO) APRM # 2 fails high requiring manual bypass		
3	PC04B	C	(BOP/SRO) Standby Gas Train "B" Fan trip during surveillance. T.S. 3.6.4.3, Seven day Required Action A.1		
4	Field Report	C	(BOP) Feedwater Pump "B" Emergency Shutdown due to excessive seal leakage.		
5		R	(RO) Emergency Power Reduction using Cram Rods and Recirc Flow for Feedwater Pump Shutdown		

6	Override AN852444	C	(BOP) Reserve Transformer "A" Trouble, high temperature due to loss of Cooling Fans.
7	ED11 DG02A	M	(BOP/RO/SRO) Trip of Reserve Transformer "A", EDG-1 fails to auto start requiring a manual scram with concurrent small break LOCA.
8	FW01B Overrides RR20	C	(RO/SRO) Loss of Feedwater due to degraded power. NPS-SWG-001 fails to transfer to Line 6 following Generator trip. Small LOCA occurs during scram.
9	CS02	C	(BOP/SRO) HPCS fails to automatically start.
10	CS05	C	(BOP) HPCS Pump trip after manually starting and injecting.

### Scenario 3 - Description Summary

#### EMERGENCY FEEDWATER PUMP SHUTDOWN/RESERVE TRANSFORMER HIGH TEMPERATURE/LOSS OF HIGH PRESSURE FEED/SMALL LOCA

The scenario begins at 100% power with RCIC out of service. The crew will perform a scheduled surveillance on Standby Gas Train "B". APRM #2 will fail upscale, requiring bypassing of the failed instrument. After APRM#2 is bypassed, the Standby Gas Fan 1B will trip. The SRO will enter Tech Specs for the inoperable GTS Train.

A report from the Turbine Building that Feedwater Pump "B" seal leak is worsening will prompt the crew to perform a Rapid Power Reduction by inserting Cram Rods and reducing Recirc Flow. Cram rod insertion is required because MFLCPR is above 0.93. Following the power reduction, the crew will perform an Emergency Shutdown of Feedwater Pump "B".

When conditions are stable, Reserve Transformer "A" will experience a high temperature condition. This will require the crew to follow normal operating procedures to remove the transformer from service. The crew will perform the initial actions of transferring available offsite power feed of NPS-SWG-001 to Reserve Transformer "B", in preparation for removing Reserve "A" from service. After available offsite power feed for NPS-SWG-001 to is lined up to Reserve Transformer "B", a Reserve "A" Transformer Lockout occurs and the Division 1 Emergency Diesel Generator fails to start. This results in a required manual scram.

Following the manual scram, NPS-SWG001 fails to transfer to Line 6. A loss of all Feedwater pumps results due to the degraded electrical sources. The crew will be required to control reactor water level with the High Pressure Core Spray (CSH) Pump. The CSH Pump will require a manual start to maintain level above TAF, due to a failure of the pump to automatically start. A small LOCA occurs resulting in a loss of inventory and the need for Drywell Spray.

After High Pressure Core Spray (CSH) injection is initiated, the High Pressure Core Spray (CSH) Pump will trip on an electrical fault. This results in a loss of all High Pressure Injection. The Crew will determine that RPV level cannot be maintained above TAF and execute the Alternate Level Control steps of N2-EOP-RPV. The Crew will then restore and maintain level above TAF by performing an emergency blowdown and injecting with a Low Pressure Injection source.

Major Procedures: N2-SOP-03, N2-SOP-101C, N2-SOP-06, N2-EOP-RPV

EAL Classification: Alert 3.1.1

Termination Criteria: RPV level restored and Primary Containment parameters being controlled.

<b>Nine Mile Point 2</b>		<b>Scenario No. 4</b>		<b>Operating Test No. 1</b>	
<b>Examiners:</b>			<b>Candidates:</b> SRO: SRO-U1, SRO-U2, SRO-I3 RO: SRO-I1, SRO-I2, SRO-I4 BOP: RO-1, RO-2		
<b>Objectives:</b> Evaluate candidates ability to perform routine operating tasks using normal, abnormal and emergency procedures while ensuring compliance with Technical Specifications The candidates will respond to the following events: <ol style="list-style-type: none"> <li>1. Service Water pump trip</li> <li>2. Reactor feedwater flow transmitter failure</li> <li>3. Recirc Flow Instrument failure upscale</li> <li>4. Lowering Main Condenser vacuum due to air in-leakage</li> <li>5. Control rods fail to fully insert on a valid scram signal</li> <li>6. RHR heat exchanger Service Water MOV failure.</li> </ol> This scenario will be classified as a Site Area Emergency. (EAL 2.2.2)					
<b>Initial Conditions:</b> <ol style="list-style-type: none"> <li>1. Plant is operating at 100% power and 100% rod line. (IC-20)</li> <li>2. Standby Liquid Control Pump SLS*P1A is out of service to repair a leaky pump seal. (Day One of Seven day LCO on T.S. 3.1.7, Required Action A.)</li> <li>3. Clearance has been issued on SLS*P1A.</li> </ol>					
<b>Turnover:</b> <ol style="list-style-type: none"> <li>1. Plant is at 100% reactor power and 100% rod line.</li> <li>2. Required evolutions during this shift - Start Service Water pump SWP*P1E for Post Maintenance testing following motor repair and shutdown SWP*P1C per N2-OP-11.</li> <li>3. SLS*P1A is out of service to repair a leaky pump seal. SLS is to be returned to service on the next shift. Day One of Seven day LCO on T.S. 3.1.7, Required Action A.</li> </ol>					
Event No.	Malf. No.	Type	Event Description		
1		N	(BOP) Swap operating Service Water pumps. (N2-OP-11).		
2	FW34B	I	(RO) Feedwater Flow Transmitter "B" fails intermittently downscale, requires taking Manual control.		
3		N	(RO) Transfer Feedwater Level Control System to Automatic.		
4	RR07B	I	(RO) Recirc Flow instrument to APRM #2 fails upscale resulting in Comparator Error and Rod Block		
5	MC01	C	(BOP) Lowering of Condenser Vacuum		
6		R	(RO) Reduce Reactor Power to about 75% and stabilize.		
7	CW01E	C	(BOP/SRO) Trip of newly started Service Water Pump. (T.S. 3.7.1.E/ Less than the required pumps running)		

8	RD17Z	M	(RO/SRO) ATWS Hydraulic Lock of Control Rods at Position 08 (18-20% power).
9	RP08A & B	C	(BOP) RRCS Timer Failure requires manual boron injection.
10	Overrides	C	(BOP) Service Water from RHR Heat exchanger valve fails to open for Suppression Pool Cooling.

#### Scenario 4 - Description Summary

##### SERVICE WATER PUMP TRIP/FEEDWATER FLOW TRANSMITTER FAILURE/LOSS OF VACUUM/LOW POWER ATWS WITH MSIV CLOSURE

The scenario begins at rated power and Standby Liquid Control Pump "A" out of service. The crew will swap operating Service Water Pumps (SWP). When SWP\*P1E is started, Feedwater flow transmitter "B" begins to intermittently fail, due to an air bound transmitter. The crew will respond by taking manual control of the Feedwater Level Control System (FWLC) and stabilizing water level in the normal operating band, per N2-SOP-06. While continuing with the SWP pump swap, the crew will dispatch assistance to determine the cause of the FWLC malfunction. After receiving a report from the field that the transmitter has been repaired, the crew will place FWLC back to automatic control. When FWLC is returned to automatic, an upscale failure of the Recirc Flow signal to APRM#2 will fail upscale, resulting in a control rod block. The crew will bypass APRM#2.

After FWLC is returned to automatic, a small increase in Condenser air in-leakage occurs and Condenser vacuum slowly degrades. The crew will perform a power reduction to stabilize vacuum per N2-SOP-09. The reduction in power will stabilize condenser vacuum. While plant conditions are stable, the recently started SWP pump will trip, requiring Tech Spec entry. After starting an additional SWP pump to restore Tech Spec compliance, vacuum will again begin to lower and the crew will initiate a manual scram, prior to the automatic turbine low vacuum trip. Control rod pattern after the scram will result in reactor power remaining about 20%. The crew will enter and execute the Failure To Scram, N2-EOP-C5.

Condenser vacuum will continue to degrade, resulting in an automatic closure of the MSIVs. The crew will then control reactor pressure using the Relief Valves and start RHR in Suppression Pool Cooling. to control the heat addition into the Primary Containment. The Service Water Valve from the RHR Heat Exchanger will fail to open causing the crew to use the other available RHR loop for Suppression Pool Cooling. The crew will be required to manually inject boron and insert control rods to limit the Suppression Pool temperature rise.

Major Procedures: N2-SOP-06, N2-SOP-09, N2-EOP-C5, N2-EOP-6 Attachment 14.

EAL Classification: SITE AREA EMERGENCY EAL 2.2.2

Termination Criteria: Control Rod Insertion is in progress per N2-EOP-6 Attachment 14



Facility: NMPC U2		Date of Exam: 07/29/02		Exam Level: RO										
Tier	Group	K/A Category Points											Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		
1. Emergency & Abnormal Plant Evolutions	1	3	4	1				4	0			1	13	
	2	4	2	5				4	2			2	19	
	3	1	0	2				1	0			0	4	
	Tier Totals	8	6	8				9	2			3	36	
2. Plant Systems	1	2	2	2	2	2	4	3	3	3	4	1	28	
	2	2	1	2	2	2	1	2	2	2	2	1	19	
	3	0	0	0	2	1	0	0	1	0	0	0	4	
	Tier Totals	4	3	4	6	5	5	5	6	5	6	2	51	
3. Generic Knowledge and Abilities						Cat 1		Cat 2		Cat 3		Cat 4		13
						3		3		3		4		
<p><b>Note: 1.</b> Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p><b>2.</b> The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p><b>3.</b> Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p><b>4.</b> Systems/evolutions within each group are identified on the associated outline.</p> <p><b>5.</b> The shaded areas are not applicable to the category/tier.</p> <p><b>6.*</b> The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p><b>7.</b> On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>														

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	A <sub>1</sub>	A <sub>2</sub>	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3		X					AK2.04 Knowledge of the interrelations between <b>Main Turbine Generator Trip</b> and the following: Main generator protection (1)	3.3	1
295006 SCRAM / 1		X					AK2.06 Knowledge of the interrelations between <b>SCRAM</b> and the following: Reactor power (2)	4.2	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to <b>Low Reactor Water Level</b> : Reactor feedwater (3)	3.9	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the <b>Inadvertent Reactivity Addition</b> : Fuel thermal limits (4)	3.7	1
							AA1.07 Ability to operate and/or monitor the following as they apply to <b>Inadvertent Reactivity Addition</b> : Cold water injection (5)	4.0	1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between <b>Incomplete SCRAM</b> and the following: SPDS/ERIS/CRIDS/GDS (6)	2.8	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to <b>High Drywell Pressure</b> : Containment atmosphere control (7)	3.3	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between <b>High Reactor Pressure</b> and the following: ARI/RPT/ATWS (8)	3.9	1
							EA1.08 Ability to operate and/or monitor the following as they apply to <b>High Reactor Pressure</b> : RRCS (9)	3.3	1
295031 Reactor Low Water Level / 2	X						EK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Reactor Low Water Level</b> : Water level effects on reactor power (10)	3.7	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the <b>SCRAM Condition Present and Power Above APRM Downscale or Unknown</b> : Cooldown effects on reactor power (11)	4.0	1
500000 High Containment Hydrogen Conc. / 5			X			X	EK3.05 Knowledge of the reasons for the following responses as they apply to <b>High Containment Hydrogen Conc.</b> : Operation of wetwell (suppression pool) sprays (12) RO Only	2.9	1
							2.1.32 Ability to explain and apply system limits and precautions (13)	3.4	1
K/A Category Totals:	3	4	1	4	0	1	Group Point Total:		13

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**Emergency and Abnormal Plant Evolutions - Tier 1/Group 2**

E/APE # / Name / Safety Function	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	A <sub>1</sub>	A <sub>2</sub>	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.05 Ability to determine and interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Jet pump operability (14) RO Only	3.1	1
295002 Loss of Main Condenser Vacuum / 3			X			X	AK3.05 Knowledge of the reasons for the following responses as they apply to Loss of Main Condenser Vacuum: Main steam isolation valve (15)  2.4.4 Ability to recognize abnormal indications for system operating parameters which entry-level conditions for emergency and abnormal operating procedures (16)	3.4 4.0	1 1
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of AC Pwr: Under voltage/degraded voltage effects on electrical loads (17)	2.9	1
295004 Partial or Complete Loss of DC Pwr / 6	X						AK1.02 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of DC Pwr: Redundant D.C. power supplies (18)	3.2	1
295005 Main Turbine Generator Trip				X			AA1.05 Ability to operate and/or monitor the following as they apply to Main Turbine Generator Trip: Reactor/turbine pressure regulating system (19)	3.6	1
295008 High Reactor Water Level / 2				X X			AA1.06 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: HPCS (20)  AA1.07 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: Main turbine (21) RO Only	2.8 3.4	1 1
295013 High Suppression Pool Temp. / 5		X					AK2.01 Knowledge of the interrelations between High Suppression Pool Temp. and the following: Suppression pool cooling (22)	3.6	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Control Room Abandonment: Turbine trip (23)	3.7	1
295017 High Off-site Release Rate / 9			X				AK3.02 Knowledge of the reasons for the following responses as they apply to High Off-site Release Rate: Plant Ventilation Systems (24)	3.3	1
295019 Part. or Comp. Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Part. or Comp. Loss of Inst. Air: Standby air compressor operation (25)	3.5	1
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation (26)	3.9	1
295022 Loss of CRD Pumps / 1	X						AK1.01 Knowledge of the operational applications of the following concepts as they apply to the Loss of CRD Pumps: Reactor pressure vs. rod insertion capability (27)	3.3	1
295026 High Suppression Pool Water Temp. / 5	X						EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Temp: Pump NPSH (28)	3.0	1
295029 High Suppression Pool Water Level / 5				X			EA1.03 Ability to operate and/or monitor the following as they apply to High Suppression Pool Water Level: RHR/LPCI (29)	2.9	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to Low Suppression Pool Water Level: RCIC operation (30)  EA2.02 Ability to determine and interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool temperature (31)	3.6 3.9	1 1
295033 High Sec. Cont. Area Rad. Levels / 9		X					EK2.01 Knowledge of the interrelations between High Sec. Cont. Area Rad. Levels and the following: Area radiation monitoring system (32) RO Only	3.8	1
K/A Category Point Totals:	4	2	5	4	2	2	Group Point Total:		19

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295021 Loss of Shutdown Cooling			X				AK3.01 Knowledge of the reasons for the following responses as they apply to <b>Loss of Shutdown Cooling</b> : Raising reactor water level (33) RO Only	3.3	1
295023 Refueling Accidents / 8	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Refueling Accidents</b> : Inadvertent criticality (34) RO Only	3.7	1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to <b>Secondary Containment High Differential Pressure</b> : Secondary containment ventilation response (35)	3.3	1
295036 Secondary Containment High Sump/Area Water Level / 5				X			EA1.03 Ability to operate and/or monitor the following as they apply to <b>Secondary Containment High Sump/Area Water Level</b> : Radwaste (36) RO Only	2.8	1
K/A Category Point Totals:	1	0	2	1	0	0	Group Point Total:		4

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Plant Systems - Tier 2/Group 1

System # / Name	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	K <sub>4</sub>	K <sub>5</sub>	K <sub>6</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic								X				A2.10 Ability to (a) predict the impacts of the following on the <b>CRD Hydraulic</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low HCU accumulator pressure/high level (37) <b>RO Only</b>	3.5	1
201002 RMCS									X			A3.01 Ability to monitor automatic operations of the <b>RMCS</b> including: Control rod block actuation (39) <b>RO Only</b>	3.2	1
202002 Recirculation Flow Control			X	X								K3.06 Knowledge of the effect that a loss or malfunction of the <b>Recirculation Flow Control</b> will have on the following: Recirculation flow control valve position (40)  K4.09 Knowledge of <b>Recirculation Flow Control</b> design feature(s) and/or interlock(s) which provide for the following: Minimum and maximum flow control valve position setpoints (41)	3.7 3.3	1 1
203000 RHR/LPCI: Injection Mode			X								X	K3.03 Knowledge of the effect that a loss or malfunction of the <b>RHR/LPCI: Injection Mode</b> will have on the following: Automatic depressurization logic (42)  2.1.32 Ability to explain and apply system limits and precautions (43) <b>RO Only</b>	4.2 3.4	1 1
209001 LPCS									X			A3.04 Ability to monitor automatic operations of the <b>LPCS</b> including: System flow (44)	3.7	1
209002 HPCS	X									X		K1.02 Knowledge of the physical connections and/or cause-effect relationships between <b>HPCS</b> and the following: Suppression pool (45)  A4.07 Ability to manually operate and/or monitor in the control room: Line fill pump (46)	3.5 2.8	1 1
211000 SLC	X											K1.05 Knowledge of the physical connections and/or cause-effect relationships between <b>SLC</b> and the following: RWCU (47)	3.4	1
212000 RPS										X		A4.15 Ability to manually operate and/or monitor in the control room: Recirculation pump trip/EOC RPT (48) <b>RO Only</b>	3.9	1
215003 IRM				X								K4.02 Knowledge of X <b>IRM</b> design feature(s) and/or interlock(s) which provide for the following: Reactor SCRAM signals (49)	4.0	1
215004 SRM										X		A4.04 Ability to manually operate and/or monitor in the control room: SRM drive control switches (50) <b>RO Only</b>	3.2	1
215005 APRM / LPRM						X						K6.07 Knowledge of effect that a loss or malfunction of the following will have on <b>APRM / LPRM</b> System: Flow Converter/Comparator(38)	3.2	1
217000 RCIC		X								X		K2.04 Knowledge of electrical power supplies to the following: Gland seal compressor (vacuum pump) (52)  A4.08 Ability to manually operate and/or monitor in the control room: RCIC system flow (51)	2.6 3.7	1 1

218000 ADS					X			X					K5.01 Knowledge of the operational implications of the following concepts as they apply to the ADS: ADS logic operation (53)	3.8	1
													A3.03 Ability to monitor automatic operations of the ADS including: ADS valve acoustical monitor noise (54)	3.7	1
223001 Primary CTMT and Auxiliaries		X			X								K2.09 Knowledge of electrical power supplies to the following: Drywell cooling fans (55)	2.7	1
													K5.01 Knowledge of the operational implications of the following concepts as they apply to the Primary CTMT and Auxiliaries: Vacuum breaker/relief operation (56)	3.1	1
223002 PCIS/Nuclear Steam Supply Shutoff							X						A1.02 Ability to predict and/or monitor changes in parameters associated with operating the PCIS/Nuclear Steam Supply Shutoff controls including: Valve closures (57)	3.7	1
239002 SRVs								X					A2.03 Ability to (a) predict the impacts of the following on the SRVs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV (58)	4.1	1
241000 Reactor/Turbine Pressure Regulator							X						A1.13 Ability to predict and/or monitor changes in parameters associated with operating the Reactor/Turbine Pressure Regulator controls including: Main turbine speed (59)	2.7	1
259001 Reactor Feedwater						X	X						A1.01 Ability to predict and/or monitor changes in parameters associated with operating the Reactor Feedwater System controls including: Feedwater flow/pressure (60)	3.3	1
													K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water (61)	2.7	1
259002 Reactor Water Level Control						X		X					K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Water Level Control: Main steam flow input (62)	3.1	1
													A2.06 Ability to (a) predict the impacts of the following on the Reactor Water Level Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output (63)	3.3	1
264000 EDGs						X							K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the EDGs: D.C power (64)	3.3	1
K/A Category Point Totals:	2	2	2	2	2	4	3	3	3	4	1	Group Point Total:			28

## Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X				X			<b>K5.03</b> Knowledge of the operational implications of the following concepts as they apply to the <b>Control Rod and Drive Mechanism</b> : Reactor power control (65)  <b>A3.01</b> Ability to monitor automatic operations of the <b>Control Rod and Drive Mechanism</b> including: Control rod position (66) RO Only	3.3  3.7	1  1
202001 Recirculation							X					<b>A1.10</b> Ability to predict and/or monitor changes in parameters associated with operating the <b>Recirculation</b> controls including: Recirculation seal purge flows (67) RO Only	2.6	1
204000 RWCU										X		<b>A4.06</b> Ability to manually operate and/or monitor in the control room: System flow (68) RO Only	3.0	1
205000 Shutdown Cooling	X											<b>K1.01</b> Knowledge of the physical connections and/or cause-effect relationships between <b>Shutdown Cooling</b> and the following: Reactor pressure (69) RO Only	3.6	1
214000 RPIS				X						X		<b>K4.01</b> Knowledge of <b>RPIS</b> design feature(s) and or interlock(s) which provide for the following: Reed switch locations (70) RO Only  <b>A4.03</b> Ability to manually operate and/or monitor in the control room: Control rod drive temperature (71)	3.0  2.8	1  1
215002 RBM								X			X	<b>A2.01</b> Ability to (a) predict the impacts of the following on the <b>RBM</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Withdrawal of control rod in high power region of core (72)  <b>2.4.50</b> Ability to verify system alarm setpoint and operate controls identified in the alarm response manual (73) RO Only	3.3  3.3	1  1
256000 Reactor Condensate								X				<b>A2.16</b> Ability to (a) predict the impacts of the following on the <b>Reactor Condensate</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High demineralizer differential pressure (74) RO Only	2.8	1
262001 AC Electrical Distribution			X									<b>K3.01</b> Knowledge of the effect that a loss or malfunction of the <b>AC Electrical Distribution</b> will have on the following: Major system loads (75)	3.5	1
262002 UPS (AC/DC)									X			<b>A3.01</b> Ability to monitor automatic operations of the <b>UPS (AC/DC)</b> including: Transfer from preferred to alternate source (76) RO Only	2.8	1
263000 DC Electrical Distribution		X					X					<b>K2.01</b> Knowledge of electrical power supplies to the following: Major D.C. loads (77)  <b>A1.01</b> Ability to predict and/or monitor changes in parameters associated with	3.1  2.5	1  1

												operating the <b>DC Electrical Distribution</b> controls including: Battery charging/discharging rate (78)		
271000 Offgas						X						<b>K6.09</b> Knowledge of the effect that a loss or malfunction of the following will have on the <b>Offgas</b> : Fuel cladding integrity (79) <b>RO Only</b>	3.4	1
286000 Fire Protection			X									<b>K3.01</b> Knowledge of the effect that a loss or malfunction of the <b>Fire Protection</b> will have on the following: The ability to detect fires (80)	3.2	1
290003 Control Room HVAC					X							<b>K5.01</b> Knowledge of the operational implications of the following concepts as they apply to <b>Control Room HVAC</b> : Airborne contamination (e.g. radiological, toxic gas, smoke) control (81) <b>RO Only</b>	3.2	1
300000 Instrument Air				X								<b>K4.01</b> Knowledge of <b>Instrument Air</b> design feature(s) and or interlock(s) which provide for the following: Manual/automatic transfers of control (82) <b>RO Only</b>	2.8	1
400000 Component Cooling Water	X											<b>K1.02</b> Knowledge of the physical connections and/or cause-effect relationships between <b>Component Cooling Water</b> and the following: Loads cooled by CCWS (83)	3.2	1
<b>K/A Category Point Totals:</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>Group Point Total:</b>	<b>19</b>	



401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)  
Plant Systems - Tier 2/Group 3

Plant-Specific Priorities			
System / Topic	Recommended Replacement for...	Reason	Points
Tier 2 Group 2 290003 K5.01	Tier 2 Group 2 290003 K6.04	An appropriate question can not be developed. HVAC Fire system is manual valves.	1
Tier 3 Common Generic 2.2.11	Tier 3 Common Generic 2.2.34	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 1 259001 A1.01	Tier 2 Group 1 259001 K5.02	An appropriate question can not be developed. Generic Fundamentals level of knowledge.	1
Tier 2 Group 1 217000 A4.08	Tier 2 Group 1 215005 K4.08	An appropriate question can not be developed. Replaced with RCIC operation question because of higher operational significance.	1
Plant-Specific Priority Total: (limit 10)			4

Facility: NMPC U2		Date of Exam: 07/29/02	Exam Level: RO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.10	Knowledge of conditions and limitations in the facility license (88) RO Only	2.7	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel (89)	2.5	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup (90)	4.2	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures (91)	3.0	1
	2.2.28	Knowledge of new and spent fuel movement procedures (92) RO Only	2.6	1
	2.2.11	Knowledge of the process for controlling temporary changes (93)	2.5	1
	Total			3
Radiation Control	2.3.2	Knowledge of facility ALARA program (94) RO Only	2.5	1
	2.3.9	Knowledge of the process for performing a containment purge (95)	2.5	1
	2.3.11	Ability to control radiation releases (96)	2.7	1
	Total			3
Emergency Procedures/ Plan	2.4.18	Knowledge of the specific bases for EOPs (97)	2.7	1
	2.4.27	Knowledge of fire in plant procedure (98)	3.0	1
	2.4.32	Knowledge of operator response to loss of all annunciators (99)	3.3	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications (100)	3.3	1
	Total			4
Tier 3 Point Total (RO)				13

Facility: NMPC U2		Date of Exam: 07/29/02 Exam Level: SRO											
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	5	4	3				5	4			5	26
	2	3	2	3				3	3			3	17
	Tier Totals	8	6	6				8	7			8	43
2. Plant Systems	1	2	2	3	1	3	2	2	2	2	2	3	24
	2	1	1	1	1	1	1	2	1	0	1	2	12
	3	0	0	0	1	1	0	0	1	0	0	1	4
	Tier Totals	3	3	4	3	5	3	4	4	2	3	6	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					3		4		4		6		
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6.* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>													

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Partial or Complete Loss of AC Pwr</b> : Under voltage/degraded voltage effects on electrical loads (1)	3.2	1
295006 SCRAM / 1		X			X		AK2.06 Knowledge of the interrelations between <b>SCRAM</b> and the following: Reactor power (2)	4.3	1
							AA2.04 Ability to determine and interpret the following as they apply to <b>SCRAM</b> : Reactor pressure (3) <b>SRO Only</b>	4.1	1
295007 High Reactor Pressure / 3					X		AA2.03 Ability to determine and interpret the following as they apply to <b>High Reactor Pressure</b> : Reactor water level (4) <b>SRO Only</b>	3.7	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to <b>Low Reactor Water Level</b> : Reactor feedwater (5)	3.9	1
295013 High Suppression Pool Temp. / 5		X				X	AK2.01 Knowledge of the interrelations between <b>High Suppression Pool Temp.</b> and the following: Suppression pool cooling (6)	3.7	1
							2.1.12 Knowledge of surveillance procedures (7) <b>SRO Only</b>	3.4	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the <b>Inadvertent Reactivity Addition</b> : Fuel thermal limits (8)	4.2	1
							AA1.07 Ability to operate and/or monitor the following as they apply to <b>Inadvertent Reactivity Addition</b> : Cold water injection (10)	4.1	1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between <b>Incomplete SCRAM</b> and the following: SPDS/ERIS/CRIDS/GDS (11)	3.0	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to <b>Control Room Abandonment</b> : Turbine trip (12)	3.8	1
295017 High Off-site Release Rate / 9			X				AK3.02 Knowledge of the reasons for the following responses as they apply to <b>High Off-site Release Rate</b> : Plant Ventilation Systems (13)	3.5	1
295023 Refueling Accidents / 8					X	X	AA2.05 Ability to determine and interpret the following as they apply to <b>Refueling Accidents</b> : Entry conditions of emergency plan (14) <b>SRO Only</b>	4.6	1
							2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies (15) <b>SRO Only</b>	3.6	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to <b>High Drywell Pressure</b> : Containment atmosphere control (16)	3.4	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between <b>High Reactor Pressure</b> and the following: ARI/RPT/ATWS (17)	4.1	1
							EA1.08 Ability to operate and/or monitor the following as they apply to <b>High Reactor Pressure</b> : RRCS (18)	3.7	1
295026 Suppression Pool High Water Temp. / 5	X					X	EK1.01 Knowledge of the operational applications of the following concepts as they apply to the <b>High Suppression Pool Water Temp</b> : Pump NPSH (19)	3.4	1
							2.2.22 Knowledge of limiting conditions for operations and safety limits (20) <b>SRO Only</b>	4.1	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to <b>Low Suppression Pool Water Level</b> : RCIC operation (21)	3.7	1
							EA2.02 Ability to determine and interpret the following as they apply to <b>Low Suppression Pool Water Level</b> : Suppression pool temperature (22)	3.9	1

295031 Reactor Low Water Level / 2	X					X	EK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Reactor Low Water Level</b> : Water level effects on reactor power (23)	4.1	1
							2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications (24) SRO Only	4.0	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the <b>SCRAM Condition Present and Power Above APRM Downscale or Unknown</b> : Cooldown effects on reactor power (25)	4.2	1
500000 High Containment Hydrogen Conc. / 5				X		X	EA1.05 Ability to operate and/or monitor the following as they apply to <b>High Containment Hydrogen Conc.</b> : Wetwell sprays (26) SRO Only	3.3	1
							2.1.32 Ability to explain and apply system limits and precautions (27)	3.8	1
K/A Category Totals:	5	4	3	5	4	5	Group Point Total:	26	

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295002 Loss of Main Condenser Vacuum / 3			X			X	AK3.05 Knowledge of the reasons for the following responses as they apply to <b>Loss of Main Condenser Vacuum</b> : Main steam isolation valve (28)  2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (29)	3.4 4.3	1 1
295004 Partial or Total Loss of DC Pwr / 6	X				X		AK1.02 Knowledge of the operational applications of the following concepts as they apply to the <b>Partial or Complete Loss of DC Pwr</b> : Redundant D.C. power supplies (30)  AA2.01 Ability to determine and interpret the following as they apply to <b>Partial or Total Loss of DC Pwr</b> : Cause of partial or complete loss of D.C. power (31) SRO Only	3.4 3.6	1 1
295005 Main Turbine Generator Trip / 3		X		X			AK2.04 Knowledge of the interrelations between <b>Main Turbine Generator Trip</b> and the following: Main generator protection (32)  AA1.05 Ability to operate and/or monitor the following as they apply to <b>Main Turbine Generator Trip</b> : Reactor/turbine pressure regulating system (33)	3.3 3.6	1 1
295008 High Reactor Water Level / 2				X			AA1.06 Ability to operate and/or monitor the following as they apply to <b>High Reactor Water Level</b> : HPCS (34)	2.8	1
295012 High Drywell Temperature / 5		X					AK2.02 Knowledge of the interrelations between <b>HIGH DRYWELL TEMPERATURE</b> and the following: Drywell cooling (35) SRO Only	3.7	1
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to <b>Part. or Comp. Loss of Inst. Air</b> : Standby air compressor operation (36)	3.4	1
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation (37)	4.0	1
295021 Loss of Shutdown Cooling / 4					X		AA2.02 Ability to determine and interpret the following as they apply to <b>Loss of Shutdown Cooling</b> : RHR/shutdown cooling system flow (38) SRO Only	3.4	1
295022 Loss of CRD Pumps / 1	X						AK1.01 Knowledge of the operational applications of the following concepts as they apply to the <b>Loss of CRD Pumps</b> : Reactor pressure vs. rod insertion capability (39)	3.4	1
295029 High Suppression Pool Water Level / 5	X			X			EK1.01 Knowledge of the operational applications of the following concepts as they apply to the <b>High Suppression Pool Water Level</b> : Containment integrity (40) SRO Only  EA1.03 Ability to operate and/or monitor the following as they apply to <b>High Suppression Pool Water Level</b> : RHR/LPCI (41)	3.7	1
295032 High Secondary Containment Area Temperature / 5					X	X	EA2.03 Ability to determine and interpret the following as they apply to <b>High Secondary Containment Area Temperature</b> : Cause of high area temperature (42) SRO Only  2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits (43) SRO Only	4.0 3.7	1 1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to <b>Secondary Containment High Differential Pressure</b> : Secondary containment ventilation response (44)	3.5	1
K/A Category Point Totals:	3	2	3	3	3	3	Group Point Total:		17

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## Plant Systems - Tier 2/Group 1

<b>System # / Name</b>	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	<b>K/A Topic(s)</b>	<b>Imp.</b>	<b>Points</b>
<b>202002 Recirculation Flow Control</b>			X	X								<b>K3.06 Knowledge of the effect that a loss or malfunction of the Recirculation Flow Control will have on the following:</b> <b>Recirculation flow control valve position (45)</b>	<b>3.7</b>	<b>1</b>
												<b>K4.09 Knowledge of Recirculation Flow Control design feature(s) and/or interlock(s) which provide for the following:</b> Minimum and maximum flow control valve position setpoints <b>(46)</b>	<b>3.4</b>	<b>1</b>
<b>203000 RHR/LPCI: Injection Mode</b>			X									<b>K3.03 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Injection Mode will have on the following:</b> Automatic depressurization logic <b>(47)</b>	<b>4.3</b>	<b>1</b>
<b>209001 LPCS</b>									X			<b>A3.04 Ability to monitor automatic operations of the LPCS including:</b> System flow <b>(48)</b>	<b>3.6</b>	<b>1</b>
<b>209002 HPCS</b>	X									X		<b>K1.02 Knowledge of the physical connections and/or cause-effect relationships between HPCS and the following:</b> <b>Suppression pool (49)</b>	<b>3.5</b>	<b>1</b>
												<b>A4.07 Ability to manually operate and/or monitor in the control room:</b> Line fill pump <b>(50)</b>	<b>2.8</b>	<b>1</b>
<b>211000 SLC</b>	X										X	<b>K1.05 Knowledge of the physical connections and/or cause-effect relationships between SLC and the following:</b> RWCU <b>(51)</b>	<b>3.6</b>	<b>1</b>
												<b>2.1.32 Ability to explain and apply system limits and precautions (52) SRO Only</b>	<b>3.8</b>	<b>1</b>
<b>215005 APRM / LPRM</b>						X					X	<b>K6.07 Knowledge of the effect of a loss or malfunction of the following will have on APRM/LPRM System : Flow Converter/Comparator (69)</b>	<b>3.3</b>	<b>1</b>
												<b>2.1.32 Ability to explain and apply system limits and precautions (54) SRO Only</b>	<b>3.8</b>	<b>1</b>
<b>217000 RCIC</b>		X								X		<b>K2.04 Knowledge of electrical power supplies to the following:</b> Gland seal compressor (vacuum pump) <b>(55)</b>	<b>2.6</b>	<b>1</b>
												<b>A4.08 Ability to manually operate and/or monitor in the control room:</b> RCIC system flow <b>(53)</b>	<b>3.6</b>	<b>1</b>
<b>218000 ADS</b>					X				X			<b>K5.01 Knowledge of the operational implications of the following concepts as they apply to the ADS:</b> ADS logic operation <b>(56)</b>	<b>3.8</b>	<b>1</b>
												<b>A3.03 Ability to monitor automatic operations of the ADS including:</b> ADS valve acoustical monitor noise <b>(57)</b>	<b>3.8</b>	<b>1</b>
<b>223001 Primary CTMT and Auxiliaries</b>		X			X							<b>K2.09 Knowledge of electrical power supplies to the following:</b> Drywell cooling fans <b>(58)</b>	<b>2.9</b>	<b>1</b>
												<b>K5.01 Knowledge of the operational implications of the following concepts as they apply to the Primary CTMT and Auxiliaries:</b> Vacuum breaker/relief operation <b>(59)</b>	<b>3.3</b>	<b>1</b>

223002 PCIS/Nuclear Steam Supply Shutoff							X						<b>A1.02</b> Ability to predict and/or monitor changes in parameters associated with operating the <b>PCIS/Nuclear Steam Supply Shutoff</b> controls including: Valve closures (60)	3.7	1
239002 SRVs								X				X	<b>A2.03</b> Ability to (a) predict the impacts of the following on the <b>SRVs</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV (61)  <b>2.4.6</b> Knowledge symptom based EOP mitigation strategies (62) <b>SRO Only</b>	4.2 4.0	1 1
241000 Reactor/Turbine Pressure Regulator							X						<b>A1.13</b> Ability to predict and/or monitor changes in parameters associated with operating the <b>Reactor/Turbine Pressure Regulator</b> controls including: Main turbine speed (63)	2.7	1
259002 Reactor Water Level Control						X		X					<b>K6.03</b> Knowledge of the effect that a loss or malfunction of the following will have on the <b>Reactor Water Level Control</b> : Main steam flow input (64)  <b>A2.06</b> Ability to (a) predict the impacts of the following on the <b>Reactor Water Level Control</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output (65)	3.1 3.4	1 1
262001 AC Electrical Distribution			X										<b>K3.01</b> Knowledge of the effect that a loss or malfunction of the <b>AC Electrical Distribution</b> will have on the following: Major system loads (66)	3.7	1
264000 EDGs						X							<b>K6.09</b> Knowledge of the effect that a loss or malfunction of the following will have on the <b>EDGs</b> : D.C. power (67)	3.5	1
<b>K/A Category Point Totals:</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>Group Point Total:</b>		<b>24</b>	



ES-401BWR SRO Examination OutlineForm ES-401-1 (R8, S1)

Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (68) SRO Only	4.3	1
214000 RPIS										X		A4.03 Ability to manually operate and/or monitor in the control room: Control rod drive temperature (70)	2.7	1
215002 RBM								X				A2.01 Ability to (a) predict the impacts of the following on the RBM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Withdrawal of control rod in high power region of core (71)	3.5	1
215003 IRM				X								K4.02 Knowledge of IRM design feature(s) and or interlock(s) which provide for the following: Reactor SCRAM signals (72)	4.0	1
234000 Fuel Handling Equipment					X							K5.05 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Equipment: Fuel orientation (73)	3.7	1
259001 Reactor Feedwater						X	X					K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water (74)	2.7	1
												A1.01 Ability to predict and/or monitor changes in parameters associated with operating the Reactor Feedwater System controls including: Feedwater flow/pressure (75)	3.3	1
263000 DC Electrical Distribution		X					X					K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads (76)	3.4	1
												A1.01 Ability to predict and/or monitor changes in parameters associated with operating the DC Electrical Distribution controls including: Battery charging/discharging rate (77)	2.8	1
286000 Fire Protection			X								X	K3.01 Knowledge of the effect that a loss or malfunction of the Fire Protection will have on the following: The ability to detect fires (78)	3.4	1
												2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies (79) SRO Only	3.6	1
400000 Component Cooling Water	X											K1.02 Knowledge of the physical connections and/or cause-effect relationships between Component Cooling Water and the following: Loads cooled by CCWS (80)	3.4	1
K/A Category Point Totals:	1	1	1	1	1	1	2	1	0	1	2	Group Point Total:		12

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Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X							K5.03 Knowledge of the operational implications of the following concepts as they apply to the Control Rod and Drive Mechanism: Reactor power control (81)	3.4	1
233000 Fuel Pool Cooling and Cleanup											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures (82) SRO Only	4.3	1
288000 Plant Ventilation				X								K4.03 Knowledge of Plant Ventilation Systems design feature(s) and/or interlocks which provide for the following: Automatic starting and stopping of fans (83)	2.9	1
290002 Reactor Vessel Internals								X				A2.02 Ability to (a) predict the impacts of the following on the Reactor Vessel Internals and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient (84)	3.9	1
K/A Category Point Totals:	0	0	0	1	1	0	0	1	0	0	1	Group Point Total:	4	
Plant-Specific Priorities														
System / Topic						Recommended Replacement for...					Reason			Points
Tier 3 Common Generic 2.2.11						Tier 3 Common Generic 2.2.34					An appropriate question can not be developed. Generic Fundamentals level of knowledge.			1
Tier 2 Group 2 259001 A1.01						Tier 2 Group 2 259001 K5.02					An appropriate question can not be developed. Generic Fundamentals level of knowledge.			1
Tier 2 Group 1 217000 A4.08						Tier 2 Group 1 215005 K4.08					An appropriate question can not be developed. Replaced with RCIC operation question because of higher operational significance.			1
Plant-Specific Priority Total (limit 10):														3

ES-401      Generic Knowledge and Abilities Outline (Tier 3)      Form ES-401-5 (R8, S1)

Facility: NMPC U2					Date of Exam: 07/29/02					Exam Level: SRO				
Category		K/A #	Topic				Imp.		Points					
Conduct of Operations		2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions (85) SRO Only				4.3		1					
		2.1.14	Knowledge of system status criteria which require the notification of plant personnel (87)				3.3		1					
		2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup (88)				3.9		1					
		Total							3					
Equipment Control		2.2.12	Knowledge of surveillance procedures (89)				3.4		1					
		2.2.17	Knowledge of the process for managing maintenance activities during power operations (90) SRO Only				3.5		1					
		2.2.23	Ability to track limiting conditions for operations (91) SRO Only				3.8		1					
		2.2.11	Knowledge of the process for controlling temporary changes (92)				3.4		1					
		Total							4					
Radiation Control		2.3.8	Knowledge of the process for performing a planned gaseous radioactive release (93) SRO Only				3.2		1					
		2.3.9	Knowledge of the process for performing a containment purge (94)				3.4		1					
		2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (95) SRO Only				3.3		1					
		2.3.11	Ability to control radiation releases (96)				3.2		1					
		Total							4					
Emergency Procedures/ Plan		2.4.18	Knowledge of the specific bases for EOPs (97)				3.6		1					
		2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations (98) SRO Only				4.0		1					
		2.4.27	Knowledge of fire in plant procedure (99)				3.5		1					
		2.4.30	Knowledge of which events related to system operation/status should be reported to outside agencies (86) SRO Only				3.6		1					
		2.4.32	Knowledge of operator response to loss of all annunciators(100)				3.5		1					
		2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications (9)				3.5		1					
		Total							6					
Tier 3 Point Total (SRO)									17					

Facility: NMPC U2      Date of Exam: 07/29/02      Exam Level: SRO													
Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	5	4	4				5	4			4	26
	2	3	3	3				2	3			3	17
	Tier Totals	8	7	7				7	7			7	43
2. Plant Systems	1	2	2	3	2	2	2	2	2	2	1	3	23
	2	1	1	1	1	2	1	1	1	1	1	2	13
	3	0	0	1	0	1	0	0	1	0	0	1	4
	Tier Totals	3	3	5	3	5	3	3	4	3	2	6	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		17
					4		4		4		5		

- Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by  $\pm 1$  from that specified in the table based on NRC revisions. The final exam must total 100 points.
3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.
- 6.\* The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.
7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.

ES-401 BWR SRO Examination Outline Form ES-401-1 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Partial or Complete Loss of AC Pwr</b> : Under voltage/degraded voltage effects on electrical loads	3.2	1
295006 SCRAM / 1		X			X		AK2.06 Knowledge of the interrelations between <b>SCRAM</b> and the following: Reactor power	4.3	1
							AA2.04 Ability to determine and interpret the following as they apply to <b>SCRAM</b> : Reactor pressure	4.1	1
295007 High Reactor Pressure / 3					X		AA2.03 Ability to determine and interpret the following as they apply to <b>High Reactor Pressure</b> : Reactor water level	3.7	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to <b>Low Reactor Water Level</b> : Reactor feedwater	3.9	1
295013 High Suppression Pool Temp. / 5		X	X				AK2.01 Knowledge of the interrelations between <b>High Suppression Pool Temp.</b> and the following: Suppression pool cooling	3.7	1
							AK3.02 Knowledge of the reasons for the following responses as they apply to <b>High Suppression Pool Temp.</b> : Limiting heat additions	3.8	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the <b>Inadvertent Reactivity Addition</b> : Fuel thermal limits	4.2	1
							AA1.07 Ability to operate and/or monitor the following as they apply to <b>Inadvertent Reactivity Addition</b> : Cold water injection	4.1	1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between <b>Incomplete SCRAM</b> and the following: SPDS/ERIS/CRIDS/GDS	3.0	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to <b>Control Room Abandonment</b> : Turbine trip	3.8	1
295017 High Off-site Release Rate / 9			X				AK3.04 Knowledge of the reasons for the following responses as they apply to <b>High Off-site Release Rate</b> : Power reduction	3.8	1
295023 Refueling Accidents / 8					X	X	AA2.05 Ability to determine and interpret the following as they apply to <b>Refueling Accidents</b> : Entry conditions of emergency plan	4.6	1
							2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies	3.6	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to <b>High Drywell Pressure</b> : Containment atmosphere control	3.4	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between <b>High Reactor Pressure</b> and the following: ARI/RPT/ATWS	4.1	1
							EA1.08 Ability to operate and/or monitor the following as they apply to <b>High Reactor Pressure</b> : RRCS	3.7	1
295026 Suppression Pool High Water Temp. / 5	X					X	EK1.01 Knowledge of the operational applications of the following concepts as they apply to the <b>High Suppression Pool Water Temp.</b> : Pump NPSH	3.4	1
							2.2.22 Knowledge of limiting conditions for operations and safety limits	4.1	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to <b>Low Suppression Pool Water Level</b> : RCIC operation	3.7	1
							EA2.01 Ability to determine and interpret the following as they apply to <b>Low Suppression Pool Water Level</b> : Suppression pool level	4.2	1

295031 Reactor Low Water Level / 2	X					X	EK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Reactor Low Water Level</b> : Water level effects on reactor power	4.1	1
							<del>2.1.33 Ability to recognize indications for system operating parameters which are entry-level conditions for technical specifications</del>	4.0	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the <b>SCRAM Condition Present and Power Above APRM Downscale or Unknown</b> : Cooldown effects on reactor power	4.2	1
500000 High Containment Hydrogen Conc. / 5				X		X	EA1.05 Ability to operate and/or monitor the following as they apply to <b>High Containment Hydrogen Conc.</b> : Wetwell sprays	3.3	1
							2.1.28 Knowledge of the purpose and function of major system components and controls	3.3	1
K/A Category Totals:	5	4	4	5	4	4	Group Point Total:	26	

ES-401 BWR SRO Examination OutlineForm ES-401-1 (R8, S1)									
Emergency and Abnormal Plant Evolutions - Tier 1/Group 2									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295002 Loss of Main Condenser Vacuum / 3			X			X	AK3.05 Knowledge of the reasons for the following responses as they apply to Loss of Main Condenser Vacuum: Main steam isolation valve	3.4	1
							2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.3	1
295004 Partial or Total Loss of DC Pwr / 6	X				X		AK1.02 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of DC Pwr: Redundant D.C. power supplies	3.4	1
							AA2.01 Ability to determine and interpret the following as they apply to Partial or Total Loss of DC Pwr: Cause of partial or complete loss of D.C. power	3.6	1
295005 Main Turbine Generator Trip / 3		X		X			AK2.04 Knowledge of the interrelations between Main Turbine Generator Trip and the following: Main generator protection	3.3	1
							AA1.05 Ability to operate and/or monitor the following as they apply to Main Turbine Generator Trip: Reactor/turbine pressure regulating system	3.6	1
295008 High Reactor Water Level / 2				X			AA1.06 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: HPCS	2.8	1
295012 High Drywell Temperature / 5						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls	4.0	1
295019 Partial or Total Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Part. or Comp. Loss of Inst. Air: Standby air compressor operation	3.4	1
295021 Loss of Shutdown Cooling / 4					X		AA2.02 Ability to determine and interpret the following as they apply to Loss of Shutdown Cooling: RHR/shutdown cooling system flow	3.4	1
295022 Loss of CRD Pumps / 1	X	X					AK1.01 Knowledge of the operational applications of the following concepts as they apply to the Loss of CRD Pumps: Reactor pressure vs. rod insertion capability	3.4	1
							AK2.02 Knowledge of the interrelations between Loss of CRD Pumps and the following: CRD mechanism	3.1	1
295029 High Suppression Pool Water Level / 5	X						EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Level: Containment integrity	3.7	1
295032 High Secondary Containment Area Temperature / 5					X	X	EA2.03 Ability to determine and interpret the following as they apply to X High Secondary Containment Area Temperature: Cause of high area temperature	4.0	1
							2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits	3.7	1
295033 High Secondary Containment Area Radiation Levels / 9		X					EK2.01 Knowledge of the interrelations between High Sec. Cont. Area Rad. Levels and the following: Area radiation monitoring system	4.0	1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to Secondary Containment High Differential Pressure: Secondary containment ventilation response	3.5	1
K/A Category Point Totals:	3	3	3	2	3	3	Group Point Total:		17

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Plant Systems - Tier 2/Group 1

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
202002 Recirculation Flow Control			X	X								<p><b>K3.06</b> Knowledge of the effect that a loss or malfunction of the <b>Recirculation Flow Control</b> will have on the following: Recirculation flow control valve position</p> <p><b>K4.09</b> Knowledge of <b>Recirculation Flow Control</b> design feature(s) and or interlock(s) which provide for the following: Minimum and maximum flow control valve position setpoints</p>	3.7	1
203000 RHR/LPCI: Injection Mode			X									<p><b>K3.03</b> Knowledge of the effect that a loss or malfunction of the <b>RHR/LPCI: Injection Mode</b> will have on the following: Automatic depressurization logic</p>	4.3	1
209001 LPCS									X			<p><b>A3.04</b> Ability to monitor automatic operations of the <b>LPCS</b> including: System flow</p>	3.6	1
209002 HPCS	X									X		<p><b>K1.02</b> Knowledge of the physical connections and/or cause-effect relationships between <b>HPCS</b> and the following: Suppression pool</p> <p><b>A4.07</b> Ability to manually operate and/or monitor in the control room: Line fill pump</p>	3.5	1
211000 SLC	X										X	<p><b>K1.05</b> Knowledge of the physical connections and/or cause-effect relationships between <b>SLC</b> and the following: rwcu</p> <p><b>2.1.32</b> Ability to explain and apply system limits and precautions</p>	3.6	1
215005 APRM / LPRM				X							X	<p><b>K4.08</b> Knowledge of <b>APRM / LPRM</b> design feature(s) and or interlock(s) which provide for the following: Sampling of overall core power in each APRM (accomplished through LPRM assignments and symmetrical rod patterns)</p> <p><b>2.1.32</b> Ability to explain and apply system limits and precautions</p>	3.1	1
217000 RCIC		X										<p><b>K2.04</b> Knowledge of electrical power supplies to the following: Gland seal compressor (vacuum pump)</p>	2.6	1
218000 ADS					X				X			<p><b>K5.01</b> Knowledge of the operational implications of the following concepts as they apply to the <b>ADS</b>: ADS logic operation</p> <p><b>A3.03</b> Ability to monitor automatic operations of the <b>ADS</b> including: ADS valve acoustical monitor noise</p>	3.8	1
223001 Primary CTMT and Auxiliaries		X			X							<p><b>K2.09</b> Knowledge of electrical power supplies to the following: Drywell cooling fans</p> <p><b>K5.01</b> Knowledge of the operational implications of the following concepts as they apply to the <b>Primary CTMT and Auxiliaries</b>: Vacuum breaker/relief operation</p>	2.9	1
223002 PCIS/Nuclear Steam Supply Shutoff							X					<p><b>A1.02</b> Ability to predict and/or monitor changes in parameters associated with operating the <b>PCIS/Nuclear Steam Supply Shutoff</b> controls including: Valve closures</p>	3.7	1



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Plant Systems - Tier 2/Group 2

System # / Name	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	K <sub>4</sub>	K <sub>5</sub>	K <sub>6</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.3	1
201002 RMCS									X			K3.01 Knowledge of the effect that a loss or malfunction of the RMCS will have on the following: Ability to move control rods	3.1	1
214000 RPIS										X		A4.03 Ability to manually operate and/or monitor in the control room: Control rod drive temperature	2.7	1
215002 RBM								X				A2.04 Ability to (a) predict the impacts of the following on the RBM and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply losses	2.8	1
215003 IRM				X								K4.02 Knowledge of X IRM design feature(s) and/or interlock(s) which provide for the following: Reactor SCRAM signals	4.0	1
234000 Fuel Handling Equipment					X							K5.05 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Equipment: Fuel orientation	3.7	1
259001 Reactor Feedwater					X	X						K5.02 Knowledge of the operational implications of the following concepts as they apply to the Reactor Feedwater: Water hammer	2.5	1
												K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water	2.7	1
263000 DC Electrical Distribution		X					X					K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads	3.4	1
												A1.01 Ability to predict and/or monitor changes in parameters associated with operating the DC Electrical Distribution controls including: Battery charging/discharging rate	2.8	1
286000 Fire Protection			X								X	K3.01 Knowledge of the effect that a loss or malfunction of the Fire Protection will have on the following: The ability to detect fires	3.4	1
												2.4.30 Knowledge of which events related to system operations/status should be reported to outside agencies	3.6	1
400000 Component Cooling Water	X											K1.02 Knowledge of the physical connections and/or cause-effect relationships between Component Cooling Water and the following: Loads cooled by CCWS	3.4	1
K/A Category Point Totals:	1	1	1	1	2	1	1	1	1	1	2	Group Point Total:		13

239002 SRVs								X			X	A2.03 Ability to (a) predict the impacts of the following on the SRVs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV  2.4.6 Knowledge symptom based EOP mitigation strategies	4.2  4.0	1  1
241000 Reactor/Turbine Pressure Regulator							X					A1.13 Ability to predict and/or monitor changes in parameters associated with operating the Reactor/Turbine Pressure Regulator controls including: Main turbine speed	2.7	1
259002 Reactor Water Level Control						X		X				K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Water Level Control: Main steam flow input  A2.06 Ability to (a) predict the impacts of the following on the Reactor Water Level Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output	3.1  3.4	1  1
262001 AC Electrical Distribution			X									K3.01 Knowledge of the effect that a loss or malfunction of the AC Electrical Distribution will have on the following: Major system loads	3.7	1
264000 EDGs						X						K6.06 Knowledge of the effect that a loss or malfunction of the following will have on the EDGs: Battery charger	3.1	1
K/A Category Point Totals:	2	2	3	2	2	2	2	2	2	1	3	Group Point Total:	23	

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Plant Systems - Tier 2/Group 3

System # / Name	K 1	K 2	K 3	K 4	K 5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X							K5.03 Knowledge of the operational implications of the following concepts as they apply to the <b>Control Rod and Drive Mechanism</b> : Reactor power control	3.4	1
233000 Fuel Pool Cooling and Cleanup											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.3	1
288000 Plant Ventilation			X									K3.05 Knowledge of the effect that a loss or malfunction of the <b>Plant Ventilation</b> will have on the following: Reactor building pressure	3.3	1
290002 Reactor Vessel Internals								X				A2.02 Ability to (a) predict the impacts of the following on the <b>Reactor Vessel Internals</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient	3.9	1
K/A Category Point Totals:	0	0	1	0	1	0	0	1	0	0	1	Group Point Total:		4

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total (limit 10):

Facility: NMPC U2      Date of Exam: 07/29/02      Exam Level: SRO				
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.6	Ability to supervise and assume a management role during plant transients and upset conditions	4.3	1
	2.1.13	Knowledge of facility requirements for controlling vital/controlled access	2.9	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel	3.3	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup	3.9	1
	Total			4
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.4	1
	2.2.17	Knowledge of the process for managing maintenance activities during power operations	3.5	1
	2.2.23	Ability to track limiting conditions for operations	3.8	1
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity	3.2	1
	Total			4
Radiation Control	2.3.8	Knowledge of the process for performing a planned gaseous radioactive release	3.2	1
	2.3.9	Knowledge of the process for performing a containment purge	3.4	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure	3.3	1
	2.3.11	Ability to control radiation releases	3.2	1
	Total			4
Emergency Procedures/ Plan	2.4.18	Knowledge of the specific bases for EOPs	3.6	1
	2.4.22	Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations	4.0	1
	2.4.27	Knowledge of fire in plant procedure	3.5	1
	2.4.32	Knowledge of operator response to loss of all annunciators	3.5	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications	3.5	1
	Total			5
Tier 3 Point Total (SRO)				17

Facility: NMPC U2		Date of Exam: 07/29/02		Exam Level: RO										
Tier	Group	K/A Category Points											Point Total	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *		
1. Emergency & Abnormal Plant Evolutions	1	3	4	0				5	0			1	13	
	2	5	3	5				3	2			1	19	
	3	1	1	1				1	0			0	4	
	Tier Totals	9	8	6				9	2			2	36	
2. Plant Systems	1	2	2	3	3	3	3	2	3	3	3	1	28	
	2	2	1	2	2	1	2	2	2	2	2	1	19	
	3	0	0	1	1	1	0	0	1	0	0	0	4	
	Tier Totals	4	3	6	6	5	5	4	6	5	5	2	51	
3. Generic Knowledge and Abilities						Cat 1		Cat 2		Cat 3		Cat 4		13
						3		3		3		4		
<p><b>Note: 1.</b> Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p><b>2.</b> The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by <math>\pm 1</math> from that specified in the table based on NRC revisions. The final exam must total 100 points.</p> <p><b>3.</b> Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p><b>4.</b> Systems/evolutions within each group are identified on the associated outline.</p> <p><b>5.</b> The shaded areas are not applicable to the category/tier.</p> <p><b>6.*</b> The generic K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.</p> <p><b>7.</b> On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.</p>														

ES-401 BWR RO Examination Outline Form ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	A <sub>1</sub>	A <sub>2</sub>	G	K/A Topic(s)	Imp.	Points
295005 Main Turbine Generator Trip / 3		X					AK2.04 Knowledge of the interrelations between <b>Main Turbine Generator Trip</b> and the following: Main generator protection	3.3	1
295006 SCRAM / 1		X					AK2.06 Knowledge of the interrelations between <b>SCRAM</b> and the following: Reactor power	4.2	1
295009 Low Reactor Water Level / 2				X			AA1.01 Ability to operate and/or monitor the following as they apply to <b>Low Reactor Water Level</b> : Reactor feedwater	3.9	1
295014 Inadvertent Reactivity Addition / 1	X			X			AK1.05 Knowledge of the operational applications of the following concepts as they apply to the <b>Inadvertent Reactivity Addition</b> : Fuel thermal limits	3.7	1
							AA1.07 Ability to operate and/or monitor the following as they apply to <b>Inadvertent Reactivity Addition</b> : Cold water injection	4.0	1
295015 Incomplete SCRAM / 1		X					AK2.10 Knowledge of the interrelations between <b>Incomplete SCRAM</b> and the following: SPDS/ERIS/CRIDS/GDS	2.8	1
295024 High Drywell Pressure / 5				X			EA1.19 Ability to operate and/or monitor the following as they apply to <b>High Drywell Pressure</b> : Containment atmosphere control	3.3	1
295025 High Reactor Pressure / 3		X		X			EK2.04 Knowledge of the interrelations between <b>High Reactor Pressure</b> and the following: ARI/RPT/ATWS	3.9	1
							EA1.08 Ability to operate and/or monitor the following as they apply to <b>High Reactor Pressure</b> : RRCS	3.3	1
295031 Reactor Low Water Level / 2	X						EK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Reactor Low Water Level</b> : Water level effects on reactor power	3.7	1
295037 SCRAM Condition Present and Power Above APRM Downscale or Unknown / 1	X						EK1.06 Knowledge of the operational applications of the following concepts as they apply to the <b>SCRAM Condition Present and Power Above APRM Downscale or Unknown</b> : Cooldown effects on reactor power	4.0	1
500000 High Containment Hydrogen Conc. / 5				X		X	EA1.05 Ability to operate and/or monitor the following as they apply to <b>High Containment Hydrogen Conc.</b> : Wetwell sprays	3.3	1
							2.1.28 Knowledge of the purpose and function of major system components and controls	3.2	1
K/A Category Totals:	3	4	0	5	0	1	Group Point Total:		13

ES-401 BWR RO Examination OutlineForm ES-401-2 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295001 Partial or Complete Loss of Forced Core Flow Circulation / 1 & 4					X		AA2.05 Ability to determine and interpret the following as they apply to Partial or Complete Loss of Forced Core Flow Circulation: Jet pump operability	3.1	1
295002 Loss of Main Condenser Vacuum / 3			X				AK3.05 Knowledge of the reasons for the following responses as they apply to Loss of Main Condenser Vacuum: Main steam isolation valve	3.4	1
295003 Partial or Complete Loss of AC Pwr / 6	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of AC Pwr: Under voltage/degraded voltage effects on electrical loads	2.9	1
295004 Partial or Complete Loss of DC Pwr / 6	X						AK1.02 Knowledge of the operational applications of the following concepts as they apply to the Partial or Complete Loss of DC Pwr: Redundant D.C. power supplies	3.2	1
295008 High Reactor Water Level / 2				X			AA1.06 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: HPCS	2.8	1
				X			AA1.07 Ability to operate and/or monitor the following as they apply to High Reactor Water Level: Main turbine	3.4	1
295013 High Suppression Pool Temp. / 5		X					AK2.01 Knowledge of the interrelations between High Suppression Pool Temp. and the following: Suppression pool cooling	3.6	1
295016 Control Room Abandonment / 7			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Control Room Abandonment: Turbine trip	3.7	1
295017 High Off-site Release Rate / 9			X				AK3.04 Knowledge of the reasons for the following responses as they apply to High Off-site Release Rate: Power reduction	3.6	1
295019 Part. or Comp. Loss of Inst. Air / 8			X				AK3.02 Knowledge of the reasons for the following responses as they apply to Part. or Comp. Loss of Inst. Air: Standby air compressor operation	3.5	1
295020 Inadvertent Cont. Isolation / 5 & 7						X	2.1.23 Ability to perform specific system and integrated plant procedures during different modes of plant operation	3.9	1
295022 Loss of CRD Pumps / 1	X	X					AK1.01 Knowledge of the operational applications of the following concepts as they apply to the Loss of CRD Pumps: Reactor pressure vs. rod insertion capability	3.3	1
							AK2.02 Knowledge of the interrelations between Loss of CRD Pumps and the following: CRD mechanism	3.1	1
295026 High Suppression Pool Water Temp. / 5	X						EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Temp: Pump NPSH	3.0	1
295029 High Suppression Pool Water Level / 5	X			X			EK1.01 Knowledge of the operational applications of the following concepts as they apply to the High Suppression Pool Water Level: Containment integrity	3.4	1
							EA1.03 Ability to operate and/or monitor the following as they apply to High Suppression Pool Water Level: RHR/LPCI	2.9	1
295030 Low Suppression Pool Water Level / 5			X		X		EK3.03 Knowledge of the reasons for the following responses as they apply to Low Suppression Pool Water Level: RCIC operation	3.6	1
							EA2.01 Ability to determine and interpret the following as they apply to Low Suppression Pool Water Level: Suppression pool level	4.1	1
295033 High Sec. Cont. Area Rad. Levels / 9		X					EK2.01 Knowledge of the interrelations between High Sec. Cont. Area Rad. Levels and the following: Area radiation monitoring system	3.8	1
K/A Category Point Totals:	5	3	5	3	2	1	Group Point Total:		19

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Emergency and Abnormal Plant Evolutions - Tier 1/Group 3									
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G	K/A Topic(s)	Imp.	Points
295023 Refueling Accidents / 8	X						AK1.03 Knowledge of the operational applications of the following concepts as they apply to the <b>Refueling Accidents</b> : Inadvertent criticality	3.7	1
295035 Secondary Containment High Differential Pressure / 5			X				EK3.02 Knowledge of the reasons for the following responses as they apply to <b>Secondary Containment High Differential Pressure</b> : Secondary containment ventilation response	3.3	1
295036 Secondary Containment High Sump/Area Water Level / 5		X		X			EK2.02 Knowledge of the interrelations between <b>Secondary Containment High Sump/Area Water Level</b> and the following: Post-accident sampling system	2.6	1
							EA1.03 Ability to operate and/or monitor the following as they apply to <b>Secondary Containment High Sump/Area Water Level</b> : Radwaste	2.8	1
K/A Category Point Totals:	1	1	1	1	0	0	Group Point Total:		4



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Plant Systems - Tier 2/Group 1

System # / Name	K <sub>1</sub>	K <sub>2</sub>	K <sub>3</sub>	K <sub>4</sub>	K <sub>5</sub>	K <sub>6</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	G	K/A Topic(s)	Imp.	Points
201001 CRD Hydraulic								X				A2.10 Ability to (a) predict the impacts of the following on the CRD Hydraulic and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Low HCU accumulator pressure/high level	3.5	1
201002 RMCS			X						X			K3.01 Knowledge of the effect that a loss or malfunction of the RMCS will have on the following: Ability to move control rods  A3.01 Ability to monitor automatic operations of the RMCS including: Control rod block actuation	3.4 3.2	1 1
202002 Recirculation Flow Control			X	X								K3.06 Knowledge of the effect that a loss or malfunction of the Recirculation Flow Control will have on the following: Recirculation flow control valve position  K4.09 Knowledge of Recirculation Flow Control design feature(s) and or interlock(s) which provide for the following: Minimum and maximum flow control valve position setpoints	3.7 3.3	1 1
203000 RHR/LPCI: Injection Mode			X								X	K3.03 Knowledge of the effect that a loss or malfunction of the RHR/LPCI: Injection Mode will have on the following: Automatic depressurization logic  2.1.32 Ability to explain and apply system limits and precautions	4.2 3.4	1 1
209001 LPCS									X			A3.04 Ability to monitor automatic operations of the LPCS including: System flow	3.7	1
209002 HPCS	X									X		K1.02 Knowledge of the physical connections and/or cause-effect relationships between HPCS and the following: Suppression pool  A4.07 Ability to manually operate and/or monitor in the control room: Line fill pump	3.5 2.8	1 1
211000 SLC	X											K1.05 Knowledge of the physical connections and/or cause-effect relationships between SLC and the following: rwcw	3.4	1
212000 RPS										X		A4.15 Ability to manually operate and/or monitor in the control room: Recirculation pump trip/EOC RPT	3.9	1
215003 IRM				X								K4.02 Knowledge of X IRM design feature(s) and or interlock(s) which provide for the following: Reactor SCRAM signals	4.0	1
215004 SRM										X		A4.04 Ability to manually operate and/or monitor in the control room: SRM drive control switches	3.2	1
215005 APRM / LPRM				X								K4.08 Knowledge of APRM / LPRM design feature(s) and or interlock(s) which provide for the following: Sampling of overall core power in each APRM (accomplished through LPRM assignments and symmetrical rod patterns)	2.7	1
217000 RCIC		X										K2.04 Knowledge of electrical power supplies to the following: Gland seal compressor (vacuum pump)	2.6	1

218000 ADS					X				X			K5.01 Knowledge of the operational implications of the following concepts as they apply to the ADS: ADS logic operation	3.8	1
												A3.03 Ability to monitor automatic operations of the ADS including: ADS valve acoustical monitor noise	3.7	1
223001 Primary CTMT and Auxiliaries		X			X							K2.09 Knowledge of electrical power supplies to the following: Drywell cooling fans	2.7	1
												K5.01 Knowledge of the operational implications of the following concepts as they apply to the Primary CTMT and Auxiliaries: Vacuum breaker/relief operation	3.1	1
223002 PCIS/Nuclear Steam Supply Shutoff							X					A1.02 Ability to predict and/or monitor changes in parameters associated with operating the PCIS/Nuclear Steam Supply Shutoff controls including: Valve closures	3.7	1
239002 SRVs								X				A2.03 Ability to (a) predict the impacts of the following on the SRVs and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Stuck open SRV	4.1	1
241000 Reactor/Turbine Pressure Regulator							X					A1.13 Ability to predict and/or monitor changes in parameters associated with operating the Reactor/Turbine Pressure Regulator controls including: Main turbine speed	2.7	1
259001 Reactor Feedwater					X	X						K5.02 Knowledge of the operational implications of the following concepts as they apply to the Reactor Feedwater: Water hammer	2.5 2.7	1
												K6.05 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Feedwater: Component cooling water		1
259002 Reactor Water Level Control						X		X				K6.03 Knowledge of the effect that a loss or malfunction of the following will have on the Reactor Water Level Control: Main steam flow input	3.1	1
												A2.06 Ability to (a) predict the impacts of the following on the Reactor Water Level Control and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Loss of controller signal output	3.3	1
264000 EDGs						X						K6.06 Knowledge of the effect that a loss or malfunction of the following will have on the EDGs: Battery charger	2.9	1
K/A Category Point Totals:	2	2	3	3	3	3	2	3	3	3	1	Group Point Total:	28	

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Plant Systems - Tier 2/Group 2

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
201003 Control Rod and Drive Mechanism					X				X			K5.03 Knowledge of the operational implications of the following concepts as they apply to the <b>Control Rod and Drive Mechanism</b> : Reactor power control	3.3	1
												A3.01 Ability to monitor automatic operations of the <b>Control Rod and Drive Mechanism</b> including: Control rod position	3.7	1
202001 Recirculation							X					A1.10 Ability to predict and/or monitor changes in parameters associated with operating the <b>Recirculation</b> controls including: Recirculation seal purge flows	2.6	1
204000 RWCU										X		A4.05 Ability to manually operate and/or monitor in the control room: System pressure	2.9	1
205000 Shutdown Cooling	X											K1.01 Knowledge of the physical connections and/or cause-effect relationships between <b>Shutdown Cooling</b> and the following: Reactor pressure	3.6	1
214000 RPIS				X						X		K4.01 Knowledge of <b>RPIS</b> design feature(s) and/or interlock(s) which provide for the following: Reed switch locations	3.0	1
												A4.03 Ability to manually operate and/or monitor in the control room: Control rod drive temperature	2.8	1
215002 RBM								X			X	A2.04 Ability to (a) predict the impacts of the following on the <b>RBM</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Power supply losses	2.7	1
												2.4.50 Ability to verify system alarm setpoint and operate controls identified in the alarm response manual	3.3	1
256000 Reactor Condensate								X				A2.16 Ability to (a) predict the impacts of the following on the <b>Reactor Condensate</b> and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: High demineralizer differential pressure	2.8	1
262001 AC Electrical Distribution			X									K3.01 Knowledge of the effect that a loss or malfunction of the <b>AC Electrical Distribution</b> will have on the following: Major system loads	3.5	1
262002 UPS (AC/DC)									X			A3.01 Ability to monitor automatic operations of the <b>UPS (AC/DC)</b> including: Transfer from preferred to alternate source	2.8	1
263000 DC Electrical Distribution		X					X					K2.01 Knowledge of electrical power supplies to the following: Major D.C. loads	3.1	1
												A1.01 Ability to predict and/or monitor changes in parameters associated with operating the <b>DC Electrical Distribution</b> controls including: Battery charging/discharging rate	2.5	1

271000 Offgas						X						K6.09 Knowledge of the effect that a loss or malfunction of the following will have on the Offgas: Fuel cladding integrity	3.4	1
286000 Fire Protection			X									K3.01 Knowledge of the effect that a loss or malfunction of the Fire Protection will have on the following: The ability to detect fires	3.2	1
290003 Control Room HVAC						X						K6.04 Knowledge of the effect that a loss or malfunction of the following will have on the Control Room HVAC: Fire protection	2.6	1
300000 Instrument Air				X								K4.01 Knowledge of Instrument Air design feature(s) and or interlock(s) which provide for the following: Manual/automatic transfers of control	2.8	1
400000 Component Cooling Water	X											K1.02 Knowledge of the physical connections and/or cause-effect relationships between Component Cooling Water and the following: Loads cooled by CCWS	3.2	1
K/A Category Point Totals:	2	1	2	2	1	2	2	2	2	2	1	Group Point Total:	19	

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**Plant Systems - Tier 2/Group 3**

System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	Imp.	Points
233000 Fuel Pool Cooling and Cleanup				X								K4.06 Knowledge of Fuel Pool Cooling and Cleanup design feature(s) and or interlock(s) which provide for the following: Maintenance of adequate pool level	2.9	1
234000 Fuel Handling Equipment					X							K5.05 Knowledge of the operational implications of the following concepts as they apply to the Fuel Handling Equipment: Fuel orientation	3.0	1
288000 Plant Ventilation			X									K3.05 Knowledge of the effect that a loss or malfunction of the Plant Ventilation will have on the following: Reactor building pressure	3.1	1
290002 Reactor Vessel Internals								X				A2.02 Ability to (a) predict the impacts of the following on the Reactor Vessel Internals and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: Overpressurization transient	3.6	1
K/A Category Point Totals:	0	0	1	1	1	0	0	1	0	0	0	Group Point Total:		4
Plant-Specific Priorities														
System / Topic				Recommended Replacement for...				Reason				Points		
Plant-Specific Priority Total: (limit 10)														

Facility: NMPC U2		Date of Exam: 07/29/02	Exam Level: RO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.10	Knowledge of conditions and limitations in the facility license	2.7	1
	2.1.14	Knowledge of system status criteria which require the notification of plant personnel	2.5	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup	4.2	1
	Total			3
Equipment Control	2.2.12	Knowledge of surveillance procedures	3.0	1
	2.2.28	Knowledge of new and spent fuel movement procedures	2.6	1
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity	2.8	1
	Total			3
Radiation Control	2.3.2	Knowledge of facility ALARA program	2.5	1
	2.3.9	Knowledge of the process for performing a containment purge	2.5	1
	2.3.11	Ability to control radiation releases	2.7	1
	Total			3
Emergency Procedures/ Plan	2.4.18	Knowledge of the specific bases for EOPs	2.7	1
	2.4.27	Knowledge of fire in plant procedure	3.0	1
	2.4.32	Knowledge of operator response to loss of all annunciators	3.3	1
	2.4.35	Knowledge of local auxiliary operator tasks during emergency operations including system geography and system implications	3.3	1
	Total			4
Tier 3 Point Total (RO)				13

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## Record of Rejected K/As

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Tier / Group	Randomly Selected K/A	Reason for Rejection
Various	Line out of K/As in Attached NUREG 1123	K/As not applicable to Nine Mile Point Unit 2 design per ES-401 D.1.b
TIER 1 and TIER 2	GENERIC K/As	Non-system GENERIC K/A statements suppressed per NRC Suppression Guidance Letter, 'Clarification of Guidance Regarding the Elimination of Inappropriate Knowledge and Abilities (K/A) on Written Operator Licensing Examinations' and ES-401 D.1.b
Various	<2.5 Importance Rating	All K/As with Importance rating less than 2.5 will not be selected during random generation per ES-401 D.1.b
TIER 2/GROUP 2 RO ONLY	214000 K4.02	Randomly reselected K4.01, to avoid double jeopardy with A4.03. K4.02 is similar to A4.03.
TIER 2/GROUP 2 RO ONLY	215002 2.4.49	Randomly reselected 2.4.50, 2.4.49 is not applicable, due to no Immediate Operator Actions for RBM at NMPC U2
TIER 2/GROUP 3 RO ONLY	233000 K2.02	Randomly reselected K4.06, K2.02 is not applicable, Spent Fuel Pool Cooling System contains its' own system pumps.
TIER 2/GROUP 1 SRO/RO	211000 K1.07	Randomly reselected K1.05, K1.07 is not applicable to Nine Mile Point Unit 2 design. SLS system injects through the HPCS sparger inside the downcomer.
TIER 2/GROUP 1 SRO/RO	239002 A2.04	Randomly reselected A2.03, due to over-sampling of ADS logic when compared with sampling in 218000 and 203000.