

SCENARIO OUTLINE
Columbia Generating Station
DATE: January, 2009

Facility: Columbia

NRC Scenario No: 1

Examiners: _____

Operators: _____

Initial conditions: The plant is operating at approximately 95% power due to economic dispatch.

Turnover Information: Immediately after shift turnover, reactor power is to be raised with RRC Flow until Generator Output reaches 1130 MWe. At that point stop the power increase and place the Main Turbine into Governor Valve Optimization. When complete, resume power increase to 100%.

A reactivity brief for the power increase has been held. There are no pre-conditioning limits. The STA has verified average nodal ramp rates are below preconditioning ramp rate limits. TDAS points B031 & B032 are operational.

| Event No. | Timeline | Event Type* | Event Description |
|-----------|----------|----------------|---|
| 1. | T=0 | R (SRO/RO) | Increase power with flow. |
| 2. | T=10 | N (BOP) | Place Main Turbine into Governor Valve Optimization. |
| 3. | T=12 | I (SRO/RO) | SLC-V-31 Indication Failure (Tech Spec). |
| 4. | T=20 | C (SRO/BOP) | HPCS-P-3 Failure (HPCS Keep fill Pump) (Tech Spec). |
| 5. | T=30 | C (SRO/RO) | ASD Channel A2 alarm and fault. |
| 6. | T=35 | C (ALL) | ASD UPS trouble simulating both inverters on battery power requiring RRC flow reduction and manual scram. |
| 7. | T=40 | C (ALL) | RCIC shaft coupling breaks on initiation. Both RFW Pumps trip and can not be reset. |
| 8. | T=50 | M (ALL) | OBE and RHR-B Suction Break. Emergency Depressurization when SP Level cannot be maintained GT 19'2". |

SCENARIO OUTLINE
Columbia Generating Station
DATE: January, 2009

Facility: Columbia

NRC Scenario No: 2

Examiners: _____

Operators: _____

Initial Conditions: The reactor has been operating at 100% power for the last 131 days. This is a Division 3 work week. OSP-ELEC-M703, DG-3 Monthly Surveillance, is in progress. OPS 2 is standing by in the HPCS DG room. DG-3 is running and SM-2 is being powered from TR-S per OPS-ELEC-M703. PDIS signal X108 (DG3 voltage) is not available.

Turnover Information: Continue with DG-3 monthly surveillance which has been completed through step 7.5.49.

| Time | Position | Applicants Actions or Behavior |
|-------------|--------------------|---|
| 1. | N (BOP) | Synchronize DG-3 per monthly surveillance OSP-ELEC-M703 |
| 2. | C (BOP) C (SRO) | Failure of HPCS-P-2 requiring manual trip of DG-3 SRO - Tech Spec |
| 3. | C (SRO/RO) | Failure of RFW-DPT-4B – Narrow Range on H13-P603 SRO – Tech Spec |
| 4. | R (RO) | High Level Trip of FWH-6B requiring reducing core flow to LE 92 Mlbm/hr Rod Line GT 100% requiring using Fast Shutdown Sequence to insert rods to lower the rod line May also require core flow be lowered to 75 Mlbm/hr if more rods have to be inserted |
| 5. | C (SRO/BOP) | DEH Leak eventually requires a manual scram and trip of MT and MG |
| 6. | | TR-S Lockout; MSIVs close, Initiate RCIC/CRD for level control |
| 7. | C (RO) | DG-1 and DG-2 Fails to Auto Start |
| 8. | M (All) | LOCA - Spray Wetwell and Drywell |
| 9. | | LOCA - RPV level drops to TAF. Initiate Emergency Depressurization on low RPV Level and return level to normal with low pressure ECCS pumps. |

SCENARIO OUTLINE
Columbia Generating Station
DATE: January, 2009

Facility: Columbia

NRC Scenario No: 3

Examiners: _____

Operators: _____

Initial conditions: During a plant startup following a refueling outage, Columbia is at approximately 60% with the Main Turbine Generator synchronized. CAS-C-1C is tagged out for repairs.

Turnover: Continue with the startup and raise power with flow to 65% power per PPM 3.1.2 step Q-60. The reactivity brief has been given.

| Event No. | Timeline | Event Type* | Event Description |
|-----------|----------|----------------|--|
| 1. | T=0 | R (RO) | Raise power with flow |
| 2. | T=10 | C (SRO/BOP) | MS-RV-2A Spurious open – Pull fuses to close |
| 3. | T=15 | N (BOP) | Place RHR-B in Suppression Pool Cooling |
| 4. | T=35 | I (SRO/BOP) | ARM-RIS-3 Failure |
| 5. | T=40 | C (SRO/BOP) | MT Drain Tank Controller Failure – Leads to Manual Scram and Automatic Main Turbine Trip |
| 6. | T=45 | M (ALL) | Hydraulic ATWS. Lower RPV Level to establish “LL” |
| 7. | T=50 | C (RO) | Reduced SLC flow |
| 8. | T=55 | | Perform PPM 5.5.1 (ECCS Inj. Valves) and PPM 5.5.6 (MSIV bypass) Perform PPM 5.5.10 and PPM 5.5.11 to insert control rods |
| 9. | T=65 | | Scram/Reset/Scram Inserts All Control Rods Return RPV Level to normal band |
| | T=75 | | Termination Cue: All rods are in and RPV level is being returned/is returned to normal band |

Scenario Recapitulation: Scenario Set No: 1 Scenario No: 1

| | <u>Req'd</u> | <u>Actual</u> | <u>Description</u> |
|-----------------------|--------------|---------------|--|
| Total Malfunctions | 5-8 | 6 | SLC, HPCS, ASD, SP Leak, RCIC, RFW |
| Malfs after EOP entry | 1-2 | 3 | SP Leak, RCIC, RFW |
| Abnormal Events | 2-4 | 2 | HPCS, ASD |
| Major transients | 1-2 | 1 | EQ, SP Leak, ED |
| EOPs entered | 1-2 | 2 | 5.1.1 RPV Control; 5.1.2 Primary Containment Control; |
| EOP contingencies | 0-2 | 1 | 5.1.3 Emergency Depressurization |
| Critical tasks | 2-3 | 2 | Lower RPV Pressure and return RPV/L to normal band ED on Suppression Pool low level |

Scenario Recapitulation: Scenario Set No: 1 Scenario No: 2

| | <u>Req'd</u> | <u>Actual</u> | <u>Description</u> |
|-----------------------|--------------|---------------|--|
| Total Malfunctions | 5-8 | 7 | HPCS-P-2, RFW-DPT-4B, FWH-6B, DEH, TR-S, DG1 & 2, LOCA |
| Malfs after EOP entry | 1-2 | 3 | TR-S, DG-1 & 2, LOCA |
| Abnormal Events | 2-4 | 3 | HPCS-P-2, FWH-6B, DEH |
| Major transients | 1-2 | 1 | TR-S LOCA ED on RPV/L |
| EOPs entered | 1-2 | 2 | 5.1.1 RPV Control; 5.1.2 Primary Containment Control; |
| EOP contingencies | 0-2 | 1 | 5.1.3 Emergency Depressurization |
| Critical tasks | 2-3 | 2 | Insert scram on low DEH Reservoir level ED on Low RPV Level |

Scenario Recapitulation: Scenario Set No: 1 Scenario No: 3

| | <u>Req'd</u> | <u>Actual</u> | <u>Description</u> |
|-----------------------|--------------|---------------|---|
| Total Malfunctions | 5-8 | 5 | MS-RV-2A, ARM-RIS-3, MT Drain Tank, ATWS, SLC, |
| Malfs after EOP entry | 1-2 | 1 | SLC |
| Abnormal Events | 2-4 | 2 | MS-RV-2A, MT Drain Tank |
| Major transients | 1-2 | 1 | ATWS |
| EOPs entered | 1-2 | 3 | 5.1.1 RPV Control; 5.1.2 RPV Control ATWS; 5.1.2 Primary Containment Control |
| EOP contingencies | 0-2 | 0 | |
| Critical tasks | 2-3 | 2 | Lower RPV Level during ATWS Insert Control Rods |