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GE Nuclear Energy

ABWR

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NRC

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Subject COL LICENSE INFORMATION =
Section 19.9

Message

This addresses the following
punch list items (6/12/92 version)

96	item I-1 site parameters	19.9.10
7	SC-2 RWCU items	19.9.2
26	I-10 seismic capacities	19.9.8
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19.9 COL LICENSE INFORMATION

As the NRC staff review and the PRA was being completed, a review was conducted to determine actions which will be completed by the COL applicant.

The section represents the results of that review.

19.9.1 EVENT SPECIFIC PROCEDURE FOR UNISOLATED RWCU LINE BREAK

Although very unlikely to occur (Subsection 19E.2.3.3), an unisolated reactor water cleanup system (RWCU) line break could lead to significant consequences. Attempting to control RPV water level in the normal range could lead to a continuous coolant outflow through the break since the RWCU suction nozzle and the RPV drain line connection to the suction line are below the normal RPV level. Severe reactor building flooding in the long term and eventual depletion of ECCS water sources could result if the break could not be isolated.

Since this is a very specific event, it was judged not appropriate to complicate the symptom-based Emergency Procedure Guidelines (EPGs)with actions to mitigate the event. An event-specific procedure will be developed by the COL applicant using the following guidance:

1. If an RWCU break or leak occurs (as indicated by RWCU room sump levels, temperature indication, radiation level) and successful automatic or manual isolation does not occur (as indicated by lack of closed indication on at least one of the two RWCU isolation valves), the following actions should be taken.

2. Scram and depressurize the RPV if these actions have not occurred automatically. Attempt to close the isolation valves from the main control room. Close the drain line globe valve from the main control room. Control

reactor vessel water level in accordance with the EPGs if at least one of the isolation valves is closed. If this is not the case, the level should be controlled between the top of the active fuel and 18 inches above the top of the active fuel if drain line closure is not successful. (The RPV drain line connects to the RWCU suction line at this elevation). If drain line closure was successful, control water level between the top of the fuel and 5 feet above the top of the fuel. (The RWCU suction line is about 6 feet above the top of the fuel.) Use the temperature compensated fuel zone and wide range water level indication and pumps which can be throttled (CRD, RHR, condensate pumps).

8. When practical, enter the RWCU room and/or the containment and affect the necessary repairs.

19.9.2 CONFIRMATION OF RWCU OPERATION BEYOND DESIGN BASES

RWCU can be used to remove decay heat under accident conditions by bypassing the regenerative test exchanger as noted in section 19.8. This causes the nonregenerative heat exchanger to remove additional heat. However, this could lead to exceeding the design temperature limits of the RWCU nonregenerative heat exchanger and some portions of the piping of the RWCU and the reactor building cooling water (RCW) systems.

When the design of the RWCU and RCW systems (including piping and support structures) is completed, the COL applicant will confirm that if the RWCU is operating in this heat removal mode, the following areas do not experience excessive damage due to operating outside their design basis temperature values:

1. The RWCU nonregenerative heat exchanger.

2. The RWCU piping downstream of the regenerative heat exchanger.

3. The RCW piping downstream of the nonregenerative heat exchanger.

4. The feedwater piping downstream of RWCU injection.

19.9.3 EVENT SPECIFIC PROCEDURES FOR SEVERE EXTERNAL FLOODING

Internal flooding is addressed in Appendix 19Q. Plant and site specific procedures will be developed by the COL applicant for severe external flooding along the following lines:

1. Close the watertight door between the turbine and service buildings;
2. Sandbag the external doors to the following:
   a. Reactor building,
   b. Control building,
   c. Service building,
   d. Ultimate heat sink (assumes that the service water pumps would not be flooded.),
   e. Diesel generator fuel oil transfer pits, and
   f. Radwaste building;
3. Plug the diesel generator room floor drains to prevent backflow;
4. Place a ladder to the roof of the control building for entry and egress by boat;
5. Shut the plant down; and
6. Use power from the diesel generators if offsite power is lost.

Any underground passages between buildings would not be affected because they are required to be watertight. Any leakage through the sandbags and exterior walls would be channeled to the basement storage areas by the internal flood control system.

Safe shutdown could be maintained indefinitely in this condition.

19.9.8 CONFIRMATION OF SEISMIC CAPACITIES BEYOND THE PLANT DESIGN BASES

The seismic margins analysis assumed seismic capacities for some equipment for which information was not available. It is expected that these capacities can be achieved, but confirmation must be deferred to the COL applicant when sufficient design detail is available. The actions specified in Section 19H.5 will be taken by the COL applicant.

19.9.9 PLANT WALKDOWNS

A plant walkdown to seek seismic vulnerabilities will be conducted by the COL applicant in accordance with EPRI NP-6041 as noted in Section 19H.5.

Similar walkdowns will be conducted by the COL applicant for internal fire events and for internal flooding events.

19.9.10 CONFIRMATION OF LOSS OF AC POWER EVENT

The COL applicant will confirm the estimate of the loss of AC power event (Subsection 19D.3.1.2.4), address site-specific parameters (as indicated in the staff's licensing review basis document), such as specific causes (e.g., a severe storm) of the loss of power, and their impact on recovery of AC power in a timely fashion).

19.9.11 PROCEDURES AND TRAINING FOR USE OF AC-INDEPENDENT WATER INJECTION SYSTEM

Specific, detailed procedures will be developed by the COL applicant for the use of the AC independent water injection system to provide vessel injection and drywell spray. Training will be included in the COL applicant's crew training program.

19.9.12 ACTIONS TO AVOID COMMON CAUSE FAILURES IN THE ESSENTIAL MULTIPLEXING SYSTEM (EMUX)

To reduce the potential for significant EMUX common cause failures, (see Subsection 19N.4.12), the COL applicant will take the following actions:

1. To eliminate remote multiplexing unit (RMU) miscalibration as a credible source of EMUX common cause failure, administrative procedures will be established to perform cross-channel checking of RMU outputs at the main control room safety system logic and control instrumentation, as a final check point of RMU calibration work.

2. To prevent any unidentified EMUX faults/failure modes (e.g., an undetected software fault) from propagating to other EMUX divisions, so that such unidentified faults are effectively eliminated as a credible source of EMUX common cause failure, the plant operating procedures will include the appropriate detailed procedures necessary to assure that the ABWR plant operations are maintained in compliance with the governing Technical Specifications during the periods of divisional EMUX failure. These will also include the appropriate symptom-based procedures to assure that adequate core cooling is maintained in the hypothetical event of an entire EMUX system failure.

19.9.13 ACTIONS TO MITIGATE STATION BLACKOUT EVENTS

It was necessary to make several assumptions in the assessment of plant performance under station blackout conditions as noted in Subsection 19E.2.1.2. The following actions will be taken by the COL applicant:

1. Confirm that the minimum condensate storage tank volume is 1580 cubic meters.

2. Develop battery loading profiles to define appropriate load shedding during station blackout to insure that RCIC can be operated for at least 8 hours. It is expected that compliance with COL license information item 8.3.4.16 will satisfy this need.

3. Perform analyses to confirm that RCIC room temperature will not exceed equipment design temperature without room cooling for at least 8 hours.

4. Perform analyses to confirm that control room temperature will not exceed equipment design temperature for at least 8 hours without room cooling.

19.9.14 ACTIONS TO REDUCE RISK OF INTERNAL FLOODING

In the unlikely event of significant flooding from internal sources (addressed in Appendix 19R) such as the suppression pool, condensate storage tank, or fire water system, actions will be completed by the COL applicant to ensure that the following can be performed to mitigate flooding in the turbine, control, and reactor buildings.

1. Training on isolation of potential flooding sources.

2. Pump trip and valve isolation capability of potential unlimited flood sources should be operable at all times.

3. Sizing of floor drains must be adequate to accommodate all potential flood rates.

4. Procedures for maintenance of watertight integrity of buildings and rooms especially during shutdown conditions.

19.9.15 ACTIONS TO AVOID LOSS OF DECAY HEAT REMOVAL AND MINIMIZE SHUTDOWN RISK

To reduce the potential for losing shutdown decay heat removal capability (addressed in Appendix 19Q), procedures will be prepared by the COL applicant for the following:

1. Recovery of failed operating RHR system.

2. Rapid implementation of standby RHR systems if the initially operating RHR system cannot be restored.

3. Ensuring that instrumentation associated with the following functions is kept available if the system is not in maintenance:

   - RPV isolation valves
   - ADS
   - HPCF

- LPFL
- RPV water level, pressure, and temperature
- RHR system alarms
- EDG
- Refueling interlocks
- Flood detection and valve/pump trip circuits

4. Use of alternate means of decay heat removal using non-safety grade equipment such as reactor water cleanup, fuel pool cooling, or the main condenser.

5. Use of alternate means for inventory control using non-safety grade equipment such as ac independent water addition, CRD pump, and main feedwater and condensate.

6. Recovery from loss of offsite power.

7. Boiling as a means of decay heat removal in mode 5 with the RPV head removed including available make up sources.

8. Conducting suppression pool maintenance, especially as it relates to reduced availability of ECCS suction sources.

9. Fire/flood watches during periods of degraded safety division physical integrity.

10. Ensuring that the physical barriers of at least one safety division are intact at all times.

11. Fire fighting during shutdown.

12. Use of remote shutdown panel while the plant is shutdown.

To reduce other risks during shutdown, procedures will be prepared by the COL applicant for the following:

1. Firefighting with part of the fire protection system in maintenance,
2. Outage planning using guidance from NUMARC-91-016,
3. Use of freeze seals, RIP and CRD replacement.

19.9.16 PROCEDURES FOR OPERATION OF RCIC FROM OUTSIDE THE CONTROL ROOM

In the PRA fire analysis (Subsection 19M 6.2) credit is taken for operation of RCIC from outside the control room. The COL applicant will develop procedures and conduct training for such RCIC operation.

19.9.17 ECCS TEST AND SURVEILLANCE INTERVALS

The test and surveillance intervals assumed in the PRA are documented in Tables 19D.6-1 through 19D.6-11. The COL applicant will develop a plan and implement procedures for identifying significant departures from these assumptions.

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