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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

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From:
Sent: Wednesday, May 11, 2011 2:42 PM
To: NRC Allegation
Cc
Subject: Design deficiency in GE ESBWR reactor.

Dear USNRC Engineers,

I studied latest BWR reactor design ESBWR in view of Fukushima incident from the document 'The ESBWR Plant General Description' by GE/Hitachi (183 page document). This design is safer but not foolproof. GE claims that ESBWR emergency cooling systems are totally passive but at most they can be called semi-passive only, as their operation is dependant on DC supply. If DC supply is lost, emergency cooling and depressurization systems will fail miserably and it can be catastrophic in an emergency situation. There is a fair chance of failure of DC supply as safety related battery banks (Class-1E grade batteries) are housed below grade (ground) level in reactor building. Not only battery bank but electrical penetration to primary containment is also below grade level. I understand that battery room doors are water-tight but the doors may get damaged in earthquake/tornado or any other natural disaster and they may not remain water-tight. Water may enter through the doors and it may incapacitate battery banks. No one can guaranty that doors will remain leak tight after a severe natural disaster. Even if we assume that battery room doors will remain leak tight in spite of any natural disaster (hypothetical assumption), then also water may enter into room if doors are open at the time of incident for maintenance/testing/replacement of cells etc. Loss of DC supply is like station blackout in this case. Actually in this design GE has shifted function of EDG (class-III supply) to battery bank (class-I supply) and most of the emergency systems operation (except for isolation condenser & PCC) are dependant on it like operation of explosive squib valves, control circuits etc. Fukushima incident has proved that keeping emergency supply systems (EDG, battery bank etc) on grade level or below grade level is not a prudent design. In view of this I suggest you to please enforce relocation of safety related DC batteries and their related systems above grade level so that they may not get flooded in tsunami/tornado/hurricane/heavy rain or in any other natural disaster. Following is the list of systems whose operation is dependant on DC supply.

1. Reactor depressurization system (DPVs)
2. Gravity driven core cooling system (GDCS)
3. BiMAC core catcher cooling (GDCS deluge valves)
4. Suppression pool equalization line Valves (squib valves)
5. Standby liquid control system (SLCS injection line squib valves)

From above list it is clear that most of the emergency safety function is dependant on DC supply and there is no diverse way of above system operation if DC supply fails. There is redundancy but no diversity is above safety systems operations. Thus DC supply reliability must be ensured. Relocating the class-1E battery banks to above grade elevation is not a big thing and it can be done easily. Truly speaking, operation of so many safety systems should not be dependant on a single support system (class-1E DC supply in this case). If they are then there should be at least one diverse way of system actuation.

There are some other deficiencies which should be rectified. These are given below.

1. Two CRDs are scramed by one hydraulic control unit (HCU). A single failure of one HCU will affect scram function of two CRDs. It is done for cost saving. It may be acceptable in a conventional system but not in a safety system. Safety should not be compromised for the cost otherwise it will be very costly.

2. Control room should also be located at sufficient height from the ground to prevent its flooding during tsunami/tornado/hurricane/heavy rain etc. It does not seem to be located at a safe elevation.

GE may still claim that this design is safe but please remember that before 11/3/11, Japanese were also saying the same.

Above rationale about location of class-1E grade battery bank is applicable for AP-1000 reactor also.

In view of this I request you to please implement lessons learned from Fukushima incident and enforce required modifications to make nuclear power safer and make a severe incident to happen 'Never again'.

Thank you.