Criscione, Lawrence

From: Criscione, Lawrence
Sent: Friday, October 22, 2010 9:07 AM
To: Beaulieu, David
Subject: alternate wording
Attachments: additional suggestions.doc

Dave,

Attached is some alternative or supplemental wording to what I provided yesterday.

I don't feel that strongly that this needs to make it into the IN, but I have noticed that in the industry (Exelon, Ameren and FirstEnergy all did this to some extent) there is a misunderstanding of the Point of Adding Heat and the Non Fission Heat Rate.

During a start up, the POAH is referenced accurately.

During a shutdown the POAH is often confused with the NFHR.

It is easy for the operator to maintain the reactor BELOW the POAH during a start up (MODE 2 Ascending).

It is impossible for the operator to maintain the reactor ABOVE the POAH during MODE 2 Descending. While descending, the operator can never tell when he is at or slightly above the POAH – he can only tell when he is below it or passing through it while ascending. Yet, every plant I have ever worked made some sort of reference to "keep the reactor above the POAH" at some point in its shutdown procedure. The POAH is not an acceptable bound for a power band since it cannot be judge until it is already violated – yet it routinely appears as a lower band in the shutdown procedures of many licensees (at least the ones I've worked at).

I have a 10:30 meeting in OWF. I'll probably swing by your desk this morning some time before my meeting to see if you have any questions. If you do have a question on anything, don't hesitate to give me a call on my cell phone (b)(6) (b)(6) I will not be at my desk much after 9:30 so email and my office phone are not a good way to reach me – but if you send me something I will respond to it when I return to my desk.

Thanks,

Larry

c/10

The reactor shutdown procedures of some licensees make reference to the point of adding heat. The point of adding heat is the fission power level at which there is a noticeable effect on total power; that is, the fission power at which total power begins to rise above the non fission heat rate. It is possible for operators to observe the point of adding heat during a reactor startup and making reference to the point of adding heat in reactor startup procedures is advisable. However, during a reactor shutdown it is not possible for operators to observe or note the point of adding heat until the reactor is already below it. In reactor shutdown procedures, it is not prudent to direct operators to maintain reactor power in a band that is bounded on the lower end by the point of adding heat since the operator will have no way of judging the lower end of this band until it has already been violated. Whenever it is desired to hold the reactor critical at a low power level, it is advisable to provide the operator a band that takes into account:

- The human factors of the instruments to be used (e.g. it is difficult for an operator to maintain reactor power within a band defined in percent rated reactor power if the instrumentation to be used is scaled in ion chamber amps)
- The physical limitations of the instruments to be used (e.g. instruments that measure total power are not a good indicator of fission power changes near the non fission heat rate)
- The ability of temperature-reactivity feedback to assist the operator in maintaining the reactor critical