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Sent: Wednesday, March 05, 2014 2:18 PM
To: garent@tva.gov; rhbryan@tva.gov
Cc: Quichocho, Jessie; Poole, Justin; Dion, Jeanne; Kaizer, Joshua; Clifford, Paul
Subject: Watts Bar, Unit 2 Appendix HH Open Item 61 Regarding PAD Code
Attachments: Information Required by NRC.01.docx

Per our conference call on February 27, 2014, and to resolve OI-61, we need the information as spelled out in the attached document. If something looks strange in terms of our request, please give us a call for clarification/correction. Thank you.

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1. The NRC staff intends to run FRAPCON-3.4 benchmark calculations of the fuel rod design. Provide the following inputs for FRAPCON 3.4.

A. Rod Power History, KW/ft as a function of GWd/MTU

1. Bounding thermal-mechanical operating envelope for both fuel types (i.e., UO₂ and IFBA)
2. Discuss any application of rod power uncertainties
3. Include power histories for different pellet designs for both fuel types

B. Axial Power Distribution (Fz at each axial node)

1. Include AXPDs for different axial blanket configurations.

C. Fuel Rod Design Specifications and Manufacturing Tolerances

At a minimum, this should include those variables identified in the following table.

Rod Size		Units
Outer Diameter	?	in
Inner Diameter	?	in
Pellet Diameter	?	in
Stack Length	?	in
Plenum Length	?	in
Spring Dimensions		
spring outer diameter	?	in
spring wire diameter	?	in
number of spring turns	?	
Pellet Shape		
Pellet Height	?	in
Central Hole Radius	?	in
Dish Radius	?	in
Dish Depth	?	in
Pellet Isotopics		
Fuel U-235 Enrichment	?	%
UO ₂ or MOX?	UO ₂	UO ₂ , MOX, or MOX (Halden)
	reactor grade	Reactor grade or weapons grade
O/M ratio	?	

2. For the following inputs from the above table, please provide tolerance values.
 - A. Cladding Outer Diameter
 - B. Cladding Inner Diameter
 - C. Cladding Surface Roughness
 - D. Pellet Diameter
 - E. Pellet Density
 - F. Pellet re-sinter Density
 - G. Pellet Roughness
 - H. Pellet Dish Diameter
 - I. Pellet Dish Depth
 - J. Rod Fill Pressure
 - K. Rod Plenum Length

3. For the AOO overpower (Fz vs. time) used in the clad strain calculation
 - L. Provide the input used (power vs. time)
 - M. Provide the predicted strain for both fuel types

4. Provide the predicted power to melt limit (kw/ft) vs. Burnup for both fuel types

5. Provide the following for the Rod Internal Pressure case for both fuel types
 - A. BOL Void VV
 - B. EOL Hot VV
 - C. EOL RIP
 - D. EOL FGR (% release and moles of Gas)