

Jessica Glenny - RE: Additional Input Cases

From: "MONTGOMERY, Richard (AREVA NP INC)" <Richard.Montgomery@areva.com>
To: "Jessica Glenny" <JXG6@nrc.gov>
Date: 12/14/2007 9:39 AM
Subject: RE: Additional Input Cases
CC: "Zhian Li" <ZXL1@nrc.gov>

Jessica, Zhian,

Attached is an additional calculation for a case defined as MOD3. The attached word document describes this configuration. From these recent calculations and one further observation, it appears that the most reactive package configuration is one that not only approaches a cylindrical configuration but one that also has a smaller array package surface area (less array leakage). When the packages are stacked in the noted configurations the combined exterior package surface area of the array contiguous to the water reflector varies.

Referring to the attached word file, the first case is less reactive than a 4x9 array since the package surface area is much greater when compared to the 4x9 array. MOD1 is more reactive than MOD3 since the MOD1 package surface area is smaller. At a first glance, I through MOD3 would be more reactive since it has the appearance of being more cylindrical and compact, but its package surface is greater than MOD1. This is a general observation and could be masked by the statistical uncertainty of each case.

We have looked at a further case similar to MOD1 in which opposite corner packages are removed and added to the top/bottom similar to the MOD2 array. The $k+2s$ is reduced in comparison to the original MOD1 case. The package surface area of this modified case is also greater than the base MOD1 case.

Based on these observations, the most cylindrical array with the least exposed package surface area appears to yield the highest k . From this, MOD1 is the most reactive of the 36 package arrays.

We have run these cases on two different platforms and appear to get consistent results.

Richard

From: MONTGOMERY, Richard (AREVA NP INC)
Sent: Thursday, December 13, 2007 2:52 PM
To: 'Jessica Glenny'
Cc: Zhian Li
Subject: Additional Input Cases

Jessica, Zhian,

Attached are two additional input cases which are close to a cylindrical geometry. The first case, defined as MOD1, is MOD1_GTTT_FLDGPMP_HAC_AR_40_581_FL1_1000K which models a 5x8x1 array with the corners removed yielding 36 packages. This is the most reactive package configuration with flooded gap. The keff and sigma are 0.9384 and 0.0008 which gives a $k + 2$ sigma of 0.9400. We have run this case on two different platforms that yield consistent results. A second case, MOD2, very similar to the MOD1, adds a package to the +/- Y to yield an array of 38 packages, see figure. The keff and sigma for this case are 0.9385 and 0.0009 which gives a $k + 2$ sigma of 0.9403.

These results appear to be consistent.

We are continuing to look at additional arrangements, but due to the long run times, I suspect it will take us through Friday to complete. I would expect to complete the additional calculations including QA review by early Monday morning.

Richard

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Subject: RE: Additional Input Cases
Creation Date 12/14/2007 9:36:58 AM
From: "MONTGOMERY, Richard (AREVA NP INC)"
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Recipients

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Files	Size	Date & Time
MESSAGE	2850	12/14/2007 9:36:58 AM
TEXT.htm	4998	
mapcylarys.doc	42496	
MOD3_GTIT_FLDGPMP_HAC_AR_40_691_FL1_1000K.inp		49440
Mime.822	137001	

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Expiration Date: None
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