Format of RBEC-M benchmark

In LBEC-M benchmark, Three different depletion problems are specified for the benchmark as follows:

Mode.1: Burn-up cycle consists of 1800 effective full-power days

Mode.2: Burn-up cycle consists of 900 effective full-power days

Mode.3: Fuel cycle consists of six partial fuel cycles of 300 effective full-power days each. Reactor is shut down for refuelling for 60 days. During refuelling, 1/6 mass part of fuel and fission products in core and blanket zones is removed and fresh fuel composition is added.

The requested functionals are as follows:

- For reactor depletion Modes 1 and 2;
  - k_{eff}
  - axial and radial power distributions in the core*
  - power peaking factors in the core zones
  - volume averaged neutron spectra in the core zones
  - k_{inf} in the core central zone.
- For depletion Mode 3:
  - k_{eff}
  - axial and radial power distributions in the core*
  - power peaking factors in the core zones
  - volume averaged neutron spectra in the core zones
  - k_{inf} in the core central zone

* Radial power distributions are to be calculated in two planes: in the core mid-plane and near the core top (45cm above the core mid-plane). Axial power distributions are to be calculated in the radial centre of each core zone.

In this format, you can use tables as follows;

- Table.1: BOC k_{eff} value from different codes
- Table.2 ~ 4: keff by time step, Region powers and power peaking factors, and Volume averaged neutron spectra in the core (Mode.1)
- Table.5 ~ 7: keff by time step, Region powers and power peaking factors, and Volume averaged neutron spectra in the core (Mode.2)
- Table.8 ~ 10: keff by time step, Region powers and power peaking factors, and Volume averaged neutron spectra in the core (Mode.3)

Please input number of energy group, using codes, using library and other data from the next page. If lines in table are not enough, please add lines you need. About Figure, please insert after tables in each mode. Thank you for your cooperation.

Number of energy group: please input

Use codes: please input

Use nuclear data set: please input

Table.1 BOC k_{eff} value from different codes

BOC k_{eff}	
Codes	k_{eff} value
(e.g.) code.A	1.0000

Mode.1

Table.2 k_{eff} by time step (Mode.1)

Mode.1			
k_{eff} for 900MW, 1800 Days Cycle			
day	Codes		
	(e.g.) code.A		
0	1.00000		
200			
400			
600			
800			
1000			
1200			
1400			
1600			
1800			

Table.3 Region powers and power peaking factors (Mode.1)

Mode.1					
	ZONE	Power(Watts)	Power Density (Watts/cc)	Peak Density (Watts/cc)	Peak to AVG. Power Density
BOC	Core1	(e.g.) 1.00E+08			
	Core2				
	Core3				
EOC	Core1				
	Core2				
	Core3				

Table.4 Volume averaged neutron spectra in the core (Mode.1)

Mode.1						
day	BOC			EOC		
Energy	Core.1	Core.2	Core.3	Core.1	Core.2	Core.3
1.00E+7	1.00E+10					

Mode.2

Table.5 k_{eff} by time step (Mode.2)

Mode.2			
k_{eff} for 900MW, 900 Days Cycle			
day	Codes		
0			
100			
200			
300			
400			
500			
600			
700			
800			
900			

Table.6 Region powers and power peaking factors (Mode.2)

Mode.2					
	ZONE	Power(Watts)	Power Density (Watts/cc)	Peak Density (Watts/cc)	Peak to AVG. Power Density
BOC	Core1				
	Core2				
	Core3				
EOC	Core1				
	Core2				
	Core3				

Table.7 Volume averaged neutron spectra in the core (Mode.2)

Mode.2						
day	BOC			EOC		
Energy	Core.1	Core.2	Core.3	Core.1	Core.2	Core.3

Mode.3

Table.8 k_{eff} by time step (Mode.3)

Mode.3			
k_{eff} Evolution for 900MW, 6 Cycle			
day	Codes		
0			
300			
360			
660			
720			
1020			
1080			
1380			
1440			
1740			
1800			
2100			

Table.9 Region powers and power peaking factors (Mode.3)

Mode.3					
Time Days	ZONE	Power(Watts)	Power Density (Watts/cc)	Peak Density (Watts/cc)	Peak to AVG. Power Density
0	Core.1				
	Core.2				
	Core.3				
300	Core.1				
	Core.2				
	Core.3				
360	Core.1				
	Core.2				
	Core.3				
660	Core.1				
	Core.2				
	Core.3				
720	Core.1				
	Core.2				
	Core.3				
1020	Core.1				
	Core.2				
	Core.3				
1080	Core.1				
	Core.2				
	Core.3				
1380	Core.1				
	Core.2				
	Core.3				
1440	Core.1				
	Core.2				
	Core.3				
1740	Core.1				
	Core.2				
	Core.3				
1800	Core.1				
	Core.2				
	Core.3				
2100	Core.1				
	Core.2				
	Core.3				

Table.10 Volume averaged neutron spectra in the core (Mode.3)

Mode.3									
day	0			300			360		
Energy	Core.1	Core.2	Core.3	Core.1	Core.2	Core.3	Core.1	Core.2	Core.3