Proposal of Target Accuracy for ADS Neutronics Design

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	Proposal for ADS	
Multiplication factor (BOL)	450pcm	From the viewpoint of core configuration. ±3 FA (fuel assemblies) can be permitted (One FA has about 150 pcm).
Power peak (BOL)	5%	If k-eff=0.98 at BOL. This value is used for the estimation of cladding tube temperature for SFR.
Burnup reactivity swing	200 pcm	If k-eff changes from 0.98 (BOL) to 0.96 (EOL). The value is 5% of the subcriticality at EOL.
Coolant void reactivity	300 pcm	It should be set as pcm to consider positive/negative effects. The definition of coolant void (in core or whole region) should be explained.
Doppler reactivity	10%	The doppler reactivity is not so important in ADS design because the value is very small.
Major nuclide density at end of irradiation cycle	2%	Same as NEA WPEC/SG26 report
Other nuclide density at end of irradiation cycle	10%	Same as NEA WPEC/SG26 report

Discussed based on ANE 111, 449-459 (2018)

Additional parameters to be considered for ADS

	Proposal for ADS	
β_{eff} (BOL/EOL)	3%	The subcriticality will be measured in unit of $ by PNS method in ADS. Then, it will be converted by β_{eff} to absolute subcriticality, which affects directly to the proton beam current.
Product of Number of spallation neutron (N_p) and Spallation source efficiency (φ^*)	3%	$N_p\varphi^*$ is the parameter related to the thermal power of ADS.
Heat generation by spallation reaction	5%	This value is important for the design of beam window

Comparison

	NEA/WPEC -26 report (2008)	Proposal by Dr. Salvatores	Proposal for ADS by JAEA
Multiplication factor (BOL)	300 pcm	200 pcm	450pcm
Power peak (BOL)	2%	1%	5%
Burnup reactivity swing	300 pcm	200 pcm	200 pcm
Reactivity coefficients (Coolant void and Doppler – BOL/EOL)	7%	5%	300pcm (void) 10% (Doppler)
Control rod bank	-	3%	-
Single control rod	-	2%	-
Major nuclide density at end of irradiation cycle	2%	1%	2%
Other nuclide density at end of irradiation cycle	10%	10%	10%