

Application Area	ORNL Production Tools			ORNL Custom Developed Tools		External Tools Expertly Applied	
Nuclear data	SAMMY	AMPX				NJOY	
Radiation shielding and criticality safety	SCALE (MAVRIC)	SCALE (KENO)	SCALE (TSUAMI)				MCNP®
	ADVANTG	SCALE (Sampler)	Shift				
Radiation neutronics	SCALE (TRITON)	SCALE (Polaris)	SCALE (ORIGEN)			Serpent	VESTA
	SCALE (Sampler)	VERA	SCALE (TSUAMI)				
Thermal-hydraulics and CFD	CTF			COBRA-SFS	PRATHAM (LBM)	RELAP-5 3D	TRACE
				HSSHTC	PHASTA	NRC RELAP-5 (Mod. 3.3)	COMSOL (Pipe Flow)
				HEATING-7		STAR-CCM+	ANSYS (CFX)
						COMSOL (CDF)	ANSYS (Fluent)
						OpenFOAM	Nek5000
Nuclear materials				Thermochimica		BISON	ANSYS (Structural)
Thermomechanics and fuels						COMSOL (Structural)	ANSYS (Workbench)
						ABAQUS	MAMBA
Reactor core analysis	VERA					PARCS	
Accident analysis	SCALE (ORIGN)			TRANSFORM		RELAP5-3D	MELCOR
						TRACE	NRC RELAP-5 (Mod 3.3)
Fusion plasma physics and fusion neutronics	SCALE (Shift)	ADVANTG		FASTRAN	AORSA		FAR3D
						EMC3-EIRENE	KORC
						SIESTA	SOLPS
						TAEFL	VMEC
Nuclear safeguards and security				SNAPSHOT	INVERSE		
				DELFC			
Fuel cycle analysis						ORION	

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Nuclear transportation and storage analysis	SCALE (ORIGN)	SCALE (MAVRIC)		UNF-ST&DARDS	COBRA-SFS	LS-DYNA	ANSYS (DYNA)
	SCALE (KENO)	SCALE (TSUNAMI)					
	SCALE (TRITON)	SCALE (POLARIS)					
	SCALE (Sampler)						
Probabilistic risk assessment				TRANSFORM		SAPHIRE	RAVEN
HPC analysis	VERA	Shift	Denovo			Nek5000	
Parametric design sensitivity	SCALE (Sampler)					HEEDS	DAKOTA
Advanced meshing capabilities				CartGen++		ICEM CFD	HEXPRESS
Advanced geometric modeling						ANSYS (SpaceClaim) Creo Parametric	SolidWorks
Client application deployment						COMSOL (Server)	COMSOL (Application Builder)

*Table 1. Software tools expertly applied for nuclear analysis*