Table 1. Cross-Sections Involved in the ENDF/B-VI and NEANDC/INDC Standards Evaluation.

Cross-Section	ENDF/B-VI &NEANDC/INDC Energy Range of Standard	ENDF/B-VIIb2 &INDC Energy Range of Standard	Comments
H(n,n)	1 keV to 20 MeV	1 keV to 20 MeV	Independent R-matrix fit for ENDF/B-VII
^{3}He(n,p)	Thermal to 50 keV	Thermal to 50 keV	Independent R-matrix fit for ENDF/B-VI
^{6}Li(n,t)	Thermal to 1 MeV	Thermal to 1 MeV	Used in global evaluation
^{6}Li(n,n)	—	—	Used in global evaluation
^{10}B(n,$\alpha_1\gamma$)	Thermal to 250 keV	Thermal to 1 MeV	Used in global evaluation
^{10}B(n,α_0)	Thermal to 250 keV	Thermal to 1 MeV	Used in global evaluation
^{10}B(n,α)	Thermal to 250 keV	Thermal to 1 MeV	Used in global evaluation, ^{10}B(n,α) = ^{10}B(n,$\alpha_1\gamma$) + ^{10}B(n,α_0) cross-sections
^{10}B(n,n)	—	—	Used in global evaluation
C(n,n)	Below 1.8 MeV	Below 1.8 MeV	Independent R-matrix fit for ENDF/B-VI

^{197}Au(n,γ)	Thermal and 0.2 MeV to 2.5 MeV	Thermal and 0.2 MeV to 2.5 MeV	Used in global evaluation
^{235}U(n,f)	Thermal and 0.15 MeV to 20 MeV	Thermal and 0.15 MeV to 200 MeV	Used in global evaluation
^{238}U(n,f)	Threshold to 20 MeV	2 MeV to 200 MeV	Used in global evaluation
^{238}U(n,γ)	—	—	Used in global evaluation
^{239}Pu(n,f)	—	—	Used in global evaluation

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Table 2. Standards and other cross sections obtained in the standards evaluation (above 0.0253 eV) and their covariance matrices of uncertainties, which are presently included in the ENDF/B-VIIb2 general purpose files.

Reaction	Cross section is included in ENDF/B-VIIb2 general purpose file	Covariance matrix for standard and other cross sections was produced	Covariance matrix is included in ENDF/B-VIIb2 general purpose file
^{1}H(n,n)	+	no	no
^{1}H(n,γ)	+	no	no
^{3}He(n,p)	+	no	no
^{6}Li(n,t)	+	+	no
^{6}Li(n,n)	+	+	no
^{6}Li(n,tot)	+	+	no
^{10}B(n,α_0)	+	+	+
^{10}B(n,α_1)	+	+	+
^{10}B(n,α)	+	+	+
^{10}B(n,n)	no	+	no
^{10}B(n,tot)	no	+	no
^{nat}C(n,n)	+	+	+
^{197}Au(n,γ)	+	+	+
^{235}U(n,f)	+ (below 20 MeV)	+	no
^{238}U(n,f)	+ (below 20 MeV)	+	no
^{238}U(n,γ)	+	+	no
^{239}Pu(n,f)	+ (below 20 MeV)	+	no

Cross-reaction/cross-material covariances were not incorporated

Table 3a, 3b. Comparison of thermal cross sections and constants. All cross sections are given in barns

ENDF/B-VII.b2 values were calculated from the original files. The identical values are obtained if we will use LINEAR-RECENT-INTER. INTER was used for double-checking and calculation of the Westcott factors g_f and g_a.

Table 3a.

Reaction	Standards	ENDF/B-VII.b2	Atlas-2006
		Cross sections used as (basic) standards	
^{3}He(n,p)	**5316±16**	**5316**	5333±7
^{6}Li(n,t)	**938.467±1.267**	**938.467**	940±4
^{10}B(n,α_1)	**3600.87±2.96**	**3600.87**	
^{10}B(n,α)	**3842.56±3.02**	**3842.56**	3837±9
^{197}Au(n,γ)	**98.659±0.139**	**98.662**	98.65±0.09
^{235}U(n,f)	**584.326±1.022**	**585.086**	582.6±1.1
		Byproducts of the standards evaluation	
^{1}H(n,n)	**20.436±0.409**	**20.436**	20.491±0.014
^{6}Li(n,n)	**0.6894±0.0262**	**0.7175**	**0.75±0.02**
^{10}B(n,n)	**2.1280±0.0233**	**2.175**	**2.23±0.06**
^{10}B(n,α_0)	**241.69±0.60**	**241.69**	
^{12}C(n,n)	**4.7392±0.0095**	**4.7392**	
^{238}U(n,γ)	**2.677±0.012**	**2.6826**	2.680±0.019
^{239}Pu(n,f)	**750.00±1.83**	**747.401**	748.1±2.0

Reaction	Standards	ENDF/B-VII.b2	Atlas-2006
Evaluation of thermal constants for standards is based on Axton's pre-evaluated values			
^{233}U(n,n)	12.11±0.66	12.15	12.7±0.3
^{233}U(n,γ)	45.56±0.68	45.24	45.5±0.7
^{233}U(n,f)	531.22±1.31	531.22	529.1±1.2
g_f(^{233}U)	0.9956±0.0014	0.9966	0.9955±0.0015
g_a(^{233}U)	0.9996±0.0011	0.9994	0.9996±0.0011
<ν_t(^{233}U)>	2.497±0.004	**2.504**	2.493±0.004
^{235}U(n,n)	14.087±0.220	**15.08**	14.02±0.22
^{235}U(n,γ)	99.4±0.7	98.69	98.8±0.8
g_f(^{235}U)	0.9773±0.0008	**0.9764**	0.9771±0.0008
g_a(^{235}U)	0.9788±0.0008	0.9785	0.9790±0.0008
<ν_t(^{235}U)>	2.4355±0.0023	2.4367	**2.4251±0.0034**
^{239}Pu(n,n)	7.800±0.959	7.975	7.94±0.36
^{239}Pu(n,γ)	271.50±2.14	270.33	269.3±2.9
g_f(^{239}Pu)	1.0554±0.0022	1.0542	1.0553±0.0013
g_a(^{239}Pu)	1.0780±0.0024	1.0782	1.077±0.003
<ν_t(^{239}Pu)>	2.8836±0.0047	2.8789	2.879±0.006

^{241}Pu(n,n)	12.13±2.61	11.24	9±1
^{241}Pu(n,γ)	361.79±4.95	363.05	362.1±5.1
^{241}Pu(n,f)	1013.96±6.56	1011.85	1011.1±6.2
$g_f(^{241}$Pu)	1.045±0.006	1.046	1.046±0.006
$g_a(^{241}$Pu)	1.044±0.002	1.042	
$<\nu_t(^{241}$Pu)>	2.9479±0.0054	2.9453	2.924±0.007
$<\nu_t(^{252}$Cf)>	3.7692±0.0047		3.7675±0.0040

Conclusions:

1. For exclusion of ^{235}U thermal values, all data recommended as standards are incorporated in the ENDF/B-VII.2 general purpose files.

2. Generally, good consistency is observed between the thermal constants obtained in the standards combined fit and independently evaluated values from Atlas-2006.

3. There is no much freedom in changes of the thermal cross sections from point of view of the available microscopic data.

4. Full covariance matrices including blocks with non-negligible cross-reaction/cross-material covariances can be inserted in the general purpose files.