

APPENDIX 1

The choice of evaluation for the JEFF-3.1 Neutron General Purpose Library with comparison of the origin of the JEFF-3.0 evaluations is presented below, including some background information about the JEFF-3.1 project. This document was prepared by A.J. Koning, NRG Petten, during the compilation of the library.

Contents of General Purpose Library JEFF-3.1

This section discusses the selection of isotopes for the JEFF-3.1 neutron general purpose file. The procedure for this is reminiscent to that of the JEFF-3.0 library. The contents of the JEFF-3.0T starter file were proposed in 1996 in a document by John Rowlands [row96]. For each nuclide for which evaluations, in any data library, were available, he proposed a best evaluation for JEFF-3.0, keeping in mind the most important application of each nuclide. According to John Rowlands, "the judgement about "best" is based on the date of the evaluation and its completeness". The resulting selection was then discussed at the JEFF meeting and after several changes the JEFF-3.0T starter file was ready. What followed was a few years of solving format problems, testing and benchmarking, leading to the release of JEFF-3.0 in April 2002. A similar procedure has now been followed for the JEFF-3.1 data library. In most cases, the reasons outlined in [row96] to prefer one evaluation over the other are still valid. In other cases, new evaluations have appeared, and the choice was reconsidered. This section contains a table which specifies the data file for each isotope in JEFF-3.1, together with its justification. For the selection process, basically 4 rules were put into practice:

1. Include new European evaluations that have emerged since the release of JEFF-3.0.
2. As the default upgrade, adopt newer versions of evaluations that have been selected for JEFF-3.0: if for JEFF-3.0 an isotope was selected from e.g. JENDL-3.2, then adopt JENDL-3.3 for the same isotope in JEFF-3.1 (provided the JENDL-3.3 evaluation is an improvement!).
3. Choose source evaluations for JEFF-3.1 other than those of JEFF-3.0 if there are reasons to do so. This would overrule 2.
4. There were still 17 evaluated isotopes in other libraries that are not included in JEFF-3.0 (e.g. Nb-94, Fm-255). They are adopted.

The existing available data libraries in the world, JEFF-3.0, ENDF/B-VI.8, ENDF/B-VIIb0 (preliminary version), JENDL-3.3, EFF-2.4, EFF-3.0, BROND-2.2, and CENDL-2.1 have been scanned to come to the choice detailed in the table below. As additional guidelines, use has been made of the following references:

- row96 J. Rowlands, Proposed selection of data for JEFF-3, JEF/DOC-657; see also JEF/DOC-664.695,741
- dui02 M.C. Duijvestijn and A. Hogenbirk, MCNP libraries: Contents of the JEFF-3.0, ENDF/B-VI.8. and JENDL-3.3 based neutron cross-section libraries for MCNP, NRG report 02.50466 (2002)

fis03 U. Fischer, Nuclear data for design analyses of the test blanket modules in ITER: Review and recommendations for EFF/JEFF evaluations, EFF-DOC-852 (2003).

sub04 J.C. Sublet et al, JEFF-3.0 feedbacks and preJEFF-3.1 proposals, JEF/DOC-1011

bou04 O. Bouland, Motivation for new measurements on Am isotopes, JEF/DOC-1001.

nou04 A. Nouri "The JEFF-3.0 library", JEFF Report 19.

The table below displays the resulting selection for the 381 materials (374 nuclides and 7 elements) that are included in JEFF-3.1.

Explanation of the table

The first column 'Isotope' lists all isotopes included in JEFF-3.1. Note that it includes, as a sort of warning, the stable isotopes that do not exist in JEFF-3.1, nor in any other library, such as e.g. the Ne and Yb isotopes.

The second column 'JEFF-3.0' specifies the source of the evaluation adopted in JEFF-3.0. This is basically equal to "Rowlands' list" [row96].

The third column 'JEFF-3.1' specifies the evaluation adopted in JEFF-3.1. If this column contains 'JEFF-3.0' there is thus no change.

The fourth column 'S' specifies whether an isotope is a stable nuclide (S) or not (blank).

The fifth column 'E' specifies the maximum energy of the evaluation in MeV.

The sixth column 'Justification/Comments' gives a short justification for the upgrade for JEFF-3.1 or other comments.

The seventh column 'Change' contains a '*' if a different source library than that of JEFF-3.0 is adopted (rule 3 above), an 'n' if the isotope did not exist in JEFF-3.0 (rule 4) and an 'N' if a new evaluation for JEFF-3.1 is made (rule 1).

From As (Z=33) to Er (Z=65), the choice is often accompanied the comment "More recent evaluations available". This generally concerns fission products. We still use JEFF-3.0 for these, although other evaluations (usually JENDL-3.3) are much more complete and more recent. Many of the FP evaluations of JEFF-3.0 (mostly taken from JEF-2.2, which are often based on ENDF/B-V) are however validated or even post-adjusted to various integral experiments (e.g. reactivity worth) such as STEK. Note that for a few FP's (e.g. Cs-133), detailed studies have already led to clear recommendations, as indicated in the table below. For future releases of the JEFF library, the results of WPEC subgroup 23 on fission product evaluationsll serve as a helpful guideline.

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
H -001	ENDF/B-VI DIST-SEP91	ENDF/B-VI.8	S	150	Extension to 150 MeV Thermal capture cross section revised	
H -002	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Extension to 150 MeV New evaluation	
H -003	CENDL-2	JEFF-3.0	S	20	-	
He-003	ENDF/B-VI.3	JEFF-3.0	S	20	-	
He-004	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted	
Li-006	ENDF/B-VI.3	JEFF-3.0	S	20	-	
Li-007	EFF-2.4	JEFF-3.0	S	20	-	
Be-009	EFF-3.0	EFF-3.0 MOD6	S	20	Recent revision included	
B -010	ENDF/B-VI.3	JEFF-3.0	S	20	-	
B -011	ENDF/B-VI.3	ENDF/B-VI.8	S	20	Minor threshold revision compared to ENDF/B-VI.3	
C -000	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Extension to 150 MeV	
N -014	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Gamma-ray spectra corrected Extension to 150 MeV	
N -015	ENDF/B-VI.3	JEFF-3.0	S	20	-	
O -016	JEF-2.2	ENDF/B-VI.8	S	150	Well validated, many new gamma data New R-matrix, extension to 150 MeV	*
O -017	JEF-2.2	JEFF-3.0	S	20	-	
O -018	-	-	S	-	-	
F -019	ENDF/B-VI.3	ENDF/B-VIIb0	S	20	Gamma production added negative probabilities removed New resonance evaluation	
Ne-020	-	-	S	-	-	
Ne-021	-	-	S	-	-	
Ne-022	-	-	S	-	-	
Na-022	JEF-2.2	JEFF-3.0		20	MF5 correction included for JEFF-3.1	
Na-023	JEF-2.2	JEFF-3.0	S	20		

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Mg-024	JENDL-3.2:Mg-000	JENDL-3.3	S	20	Isotopic evaluation	
Mg-025	JENDL-3.2:Mg-000	JENDL-3.3	S	20	Isotopic evaluation	
Mg-026	JENDL-3.2:Mg-000	JENDL-3.3	S	20	Isotopic evaluation	
Al-027	ENDF/B-VI DIST-AUG99 + mod.	JEFF-3.0	S	150	-	
Si-028	EFF-3.0	JEFF-3.0	S	20	-	
Si-029	JENDL-3.2	JENDL-3.3	S	20	Processing problems for ENDF/B-VI	
Si-030	JENDL-3.2	JENDL-3.3	S	20	Processing problems for ENDF/B-VI	
P -031	JENDL-3.2	JENDL-3.3	S	20	New calculated MT1,2 MT103 from JENDL-DF99	
S -032	JENDL-3.2:S -000	JENDL-3.3	S	20	Isotopic evaluation	
S -033	JENDL-3.2:S -000	JENDL-3.3	S	20	Isotopic evaluation	
S -034	JENDL-3.2:S -000	JENDL-3.3	S	20	Isotopic evaluation	
S -036	JENDL-3.2:S -000	JENDL-3.3	S	20	Isotopic evaluation	
Cl-035	JEF-2.2:Cl-000	ENDF/B-VIIb0	S	20	Recent isotopic evaluation New resonance parameters (ORNL)	*
Cl-037	JEF-2.2:Cl-000	ENDF/B-VIIb0	S	20	Recent isotopic evaluation New resonance parameters (ORNL)	*
Ar-036	JEF-2.2	JEFF-3.0	S	20	MF5 correction included for JEFF-3.1	
Ar-038	JEF-2.2	JEFF-3.0	S	20	MF5 correction included for JEFF-3.1	
Ar-040	JEF-2.2	JENDL-3.3	S	20	New resonance data More complete	*
K -039	JENDL-3.2:K -000	JENDL-3.3	S	20	Isotopic evaluation Gamma production added	
K -040	JENDL-3.2:K -000	JENDL-3.3	S	20	Isotopic evaluation Gamma production added	
K -041	JENDL-3.2:K -000	JENDL-3.3	S	20	Isotopic evaluation Gamma production added	
Ca-040	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Ca-042	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Ca-043	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Ca-044	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Ca-046	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Ca-048	JENDL-3.2:Ca-000	New evaluation	S	200	NRG-2004	N
Sc-045	ENDF/B-VI.3	New evaluation	S	200	NRG-2004	N

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Ti-046	JENDL-3.2:Ti-000	New evaluation	S	20	IRK Vienna	N
Ti-047	JENDL-3.2:Ti-000	New evaluation	S	20	IRK Vienna	N
Ti-048	JENDL-3.2:Ti-000	New evaluation	S	20	IRK Vienna	N
Ti-049	JENDL-3.2:Ti-000	New evaluation	S	20	IRK Vienna	N
Ti-050	JENDL-3.2:Ti-000	New evaluation	S	20	IRK Vienna	N
V -000	EFF-3.0	JEFF-3.0	S	20	-	
Cr-050	ENDF/B-VI.3	JEFF-3.0	S	20		
Cr-052	EFF-3.0	EFF-3.05	S	20	Modifications for continuum spectrum	
Cr-053	ENDF/B-VI.3	JEFF-3.0	S	20		
Cr-054	ENDF/B-VI.3	JEFF-3.0	S	20		
Mn-055	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon production added	
Fe-054	ENDF/B-VI.3	New evaluation	S	200	NRG-2004	N
Fe-056	EFF-3.1	New evaluation	S	200	EFF-3.1 (< 20 MeV) + NRG-2004	N
Fe-057	JEF-2.2	New evaluation	S	200	NRG-2004	N
Fe-058	JEF-2.2	New evaluation	S	200	NRG-2004 + Moxon/Trkov res. data	N
Co-058	JEF-2.2	JEFF-3.0		20	MF5 correction included for JEFF-3.1	
Co-058m	JEF-2.2	JEFF-3.0		20	MF5 correction included for JEFF-3.1	
Co-059	ENDF/B-VI.3	JEFF-3.0	S	20	-	
Ni-058	EFF-3.1	JEFF-3.0+corr.	S	20	-	
Ni-059	JEF-2.2	JEFF-3.0+corr.		20	MF5 correction included for JEFF-3.1	
Ni-060	EFF-3.1	JEFF-3.0+corr.	S	20	Processing problem solved	
Ni-061	ENDF/B-VI.3	ENDF/B-VI.8	S	20	Ni-61,62,64 now up to 150 MeV	
Ni-062	ENDF/B-VI.3	ENDF/B-VI.8	S	20	-	
Ni-064	ENDF/B-VI.3	ENDF/B-VI.8	S	20	-	
Cu-063	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Extension to 150 MeV Gamma-ray spectrum updated	
Cu-065	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Extension to 150 MeV Gamma-ray spectrum updated	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Zn-000	BROND-2.2	JEFF-3.0	S	20	-	
Ga-000	JENDL-3.2 + JEF-2.2	JEFF-3.0	S	20	JENDL-3.3 isotopic evaluations exist, but without gamma production	
Ge-070	JEF-2.2	New evaluation	S	200	NRG-2004	N
Ge-072	JEF-2.2	New evaluation	S	200	NRG-2004	N
Ge-073	JEF-2.2	New evaluation	S	200	NRG-2004	N
Ge-074	JEF-2.2	New evaluation	S	200	NRG-2004	N
Ge-076	JEF-2.2	New evaluation	S	200	NRG-2004	N
As-075	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-074	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-076	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-077	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-078	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-079	JENDL-3.2	JENDL-3.3		20	T-matrix deleted	
Se-080	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Se-082	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Br-079	JEF-2.2	JEFF-3.0	S	20	-	
Br-081	JEF-2.2	JEFF-3.0	S	20	-	
Kr-078	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Kr-080	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Kr-082	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Kr-083	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Kr-084	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Kr-085	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Kr-086	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Rb-085	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Rb-086	JEF-2.2	JEFF-3.0		20	-	
Rb-087	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sr-084	JEF-2.2	JEFF-3.0	S	20	-	
Sr-086	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sr-087	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sr-088	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sr-089	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sr-090	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Y -089	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Y -090	JEF-2.2	JEFF-3.0		20	-	
Y -091	JEF-2.2	JEFF-3.0		20	More recent evaluations available	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Zr-090	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon prod. added, MT1,2,102 revised	
Zr-091	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon prod. added, MT1,2,102 revised	
Zr-092	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon prod. added, MT1,2,102 revised	
Zr-093	JEF-2.2	JEFF-3.0		20	More complete JENDL-3.3 available	
Zr-094	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon prod. added, MT1,2,102 revised	
Zr-095	JEF-2.2	JEFF-3.0		20	More complete JENDL-3.3 available	
Zr-096	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF Photon prod. added, MT1,2,102 revised	
Nb-093	ENDF/B-VI.3	ENDF/B-VI.8	S	150	Extension to 150 MeV	
Nb-094	-	JENDL-3.3		20	More complete than ENDF/B-V (JEF-2.2)	n
Nb-095	-	JENDL-3.3		20	More complete than ENDF/B-V (JEF-2.2)	n
Mo-092	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	
Mo-094	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	
Mo-095	JENDL-3.2	ENDF/B-VIIb0	S	20	Best resonance integral	*
Mo-096	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	
Mo-097	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	
Mo-098	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	
Mo-099	JEF-2.2	JENDL-3.3	S	20	Much more complete evaluation Consistent with other isotopes	*
Mo-100	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Gamma production data added	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Tc-099	JENDL-3.2	New evaluation		20	CEA/NRG evaluation	N
Ru-096	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-098	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-099	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-100	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-101	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-102	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-103	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Ru-104	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ru-105	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Ru-106	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Rh-103	ENDF/B-VI.8	New evaluation	S	20	CEA	N
Rh-105	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pd-102	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pd-104	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pd-105	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pd-106	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pd-107	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pd-108	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pd-110	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ag-107	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ag-109	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ag-110m	-	JENDL-3.3		20	-	n
Ag-111	JEF-2.2	JEFF-3.0		20	-	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Cd-106	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-108	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-110	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-111	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-112	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-113	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-114	ENDF/B-VI.4	JEFF-3.0	S	20	-	
Cd-115m	ENDF/B-VI.4	JEFF-3.0		20	-	
Cd-116	ENDF/B-VI.4	JEFF-3.0	S	20	-	
In-113	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
In-115	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Sn-112	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-114	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-115	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-116	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-117	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-118	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-119	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-120	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-122	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-123	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sn-124	EFF-2.4 = JENDL-3	JENDL-3.3	S	20	T-matrix deleted New energy distributions	
Sn-125	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sn-126	JEF-2.2	JEFF-3.0		20	-	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Sb-121	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF, T-matrix deleted	
Sb-123	JENDL-3.2	JENDL-3.3	S	20	MF4,5 replaced by MF6 from JENDL-FF, T-matrix deleted	
Sb-124	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sb-125	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sb-126	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Te-120	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-122	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-123	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-124	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-125	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-126	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-127m	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Te-128	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-129m	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Te-130	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Te-132	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
I -127	JEF-2.2	New evaluation	S	20	CEA evaluation	N
I -129	JEF-2.2	New evaluation		20	CEA evaluation	N
I -130	JEF-2.2	JEFF-3.0		20	-	
I -131	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
I -135	JEF-2.2	JEFF-3.0		20	-	
Xe-124	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-126	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-128	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-129	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-130	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-131	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-132	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-133	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Xe-134	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Xe-135	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Xe-136	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Cs-133	ENDF/B-VI.7	JEFF-3.0	S	20	Recommended in JEF/DOC-874	
Cs-134	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Cs-135	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Cs-136	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Cs-137	JEF-2.2	JEFF-3.0		20	More recent evaluations available	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Ba-130	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-132	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-134	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-135	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-136	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-137	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-138	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
Ba-140	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
La-138	JENDL-3.2	JENDL-3.3	S	20	T-matrix deleted Small adjustments	
La-139	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
La-140	JEF-2.2	JEFF-3.0		20	-	
Ce-136	-	-	S	-	-	
Ce-138	-	-	S	-	-	
Ce-140	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ce-141	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Ce-142	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Ce-143	JEF-2.2	JEFF-3.0		20	-	
Ce-144	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pr-141	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pr-142	JEF-2.2	JEFF-3.0		20	-	
Pr-143	JEF-2.2	JEFF-3.0		20	More recent evaluations available	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Nd-142	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Nd-143	JEF-2.2	JEFF-3.0	S	20	Recommended in JEF/DOC-885	
Nd-144	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Nd-145	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Nd-146	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Nd-147	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Nd-148	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Nd-150	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Pm-147	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pm-148	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pm-148m	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pm-149	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Pm-151	JEF-2.2	JEFF-3.0		20	-	
Sm-144	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sm-147	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sm-148	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sm-149	JEF-2.2	JEFF-3.0	S	20	Recommended in JEF/DOC-885	
Sm-150	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sm-151	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sm-152	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Sm-153	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Sm-154	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Eu-151	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Eu-152	JENDL-3.2	JEFF-3.0		20	Corrections of JEFF-3.0 not in JENDL-3.3 Recommended in JEF/DOC-912	
Eu-153	JENDL-3.2	JEFF-3.0	S	20	Corrections of JEFF-3.0 not in JENDL-3.3 Recommended in JEF/DOC-912	
Eu-154	ENDF/B-VI.7	JEFF-3.0		20	Recommended in JEF/DOC-885	
Eu-155	ENDF/B-VI.7	JEFF-3.0		20	Recommended in JEF/DOC-885	
Eu-156	JEF-2.2	JEFF-3.0		20	More recent evaluations available	
Eu-157	JEF-2.2	JEFF-3.0		20	More recent evaluations available	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Gd-152	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-154	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-155	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-156	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-157	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-158	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Gd-160	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Tb-159	JEF-2.2	JEFF-3.0	S	20	More recent evaluations available	
Tb-160	JEF-2.2	JEFF-3.0		20	-	
Dy-156	-	-	S	-	-	
Dy-158	-	-	S	-	-	
Dy-160	JEF-2.2	JEFF-3.0	S	20	Processing problems for ENDF/B-VI.8	*
Dy-161	JEF-2.2	ENDF/B-VI.8	S	20	Low energy data revised by Wright	*
Dy-162	JEF-2.2	ENDF/B-VI.8	S	20	Low energy data revised by Wright	*
Dy-163	JEF-2.2	ENDF/B-VI.8	S	20	Low energy data revised by Wright	*
Dy-164	JEF-2.2	ENDF/B-VI.8	S	20	Low energy data revised by Wright	*
Ho-165	ENDF/B-VI.4	ENDF/B-VI.8	S	30	Corrected total and neutron width and Emax	
Er-162	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Er-164	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Er-166	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Er-167	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Er-168	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Er-170	BROND-2.2	JENDL-3.3	S	20	New evaluation (2000), more complete New resonance parameters, Mughabghab 1984	*
Tm-169	-	-	S	-	-	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Yb-168	-	-	S	-	-	
Yb-170	-	-	S	-	-	
Yb-171	-	-	S	-	-	
Yb-172	-	-	S	-	-	
Yb-173	-	-	S	-	-	
Yb-174	-	-	S	-	-	
Yb-176	-	-	S	-	-	
Lu-175	JEF-2.2	ENDF/B-VI.8	S	20	New evaluation from R.Q. Wright (1998): MLBW, Mugh. 1984 instead of SLBW (1967)	*
Lu-176	JEF-2.2	ENDF/B-VI.8	S	20	New evaluation from R.Q. Wright (1998): MLBW, Mugh. 1984 instead of SLBW (1967)	*
Hf-174	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N
Hf-176	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N
Hf-177	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N
Hf-178	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N
Hf-179	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N
Hf-180	JENDL-3.2	New evaluation	S	20	CEA/RPI (JENDL-3.3 revised)	N

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Ta-180	-	-	S	-	-	
Ta-181	JENDL-3.2	JENDL-3.3	S	20	MT1,2,107 revised	
Ta-182	JEF-2.2	JEFF-3.0		20	-	
W -180	-	-	S	-	-	
W -182	JENDL-3.2	JENDL-3.3	S	20	MF4,5 repl. by MF6 (JENDL-FF) Photon prod. added, MT2 revised	
W -183	JENDL-3.2	JENDL-3.3	S	20	MF4,5 repl. by MF6 (JENDL-FF) Photon prod. added, MT2 revised	
W -184	JENDL-3.2	JENDL-3.3	S	20	MF4,5 repl. by MF6 (JENDL-FF) Photon prod. added, MT2 revised	
W -186	JENDL-3.2	JENDL-3.3	S	20	MF4,5 repl. by MF6 (JENDL-FF) Photon prod. added, MT2 revised	
Re-185	ENDF/B-VI.4	JEFF-3.0	S	20	= ENDF/B-VI.8	
Re-187	ENDF/B-VI.4	JEFF-3.0	S	20	= ENDF/B-VI.8	
Os-000	BROND-2.2	JEFF-3.0 + corr.	S	20	Decay scheme modified	
Ir-191	BROND-2.2 for Ir-000	ENDF/B-VI.8	S	20	Newer isotopic evaluation (1995) partly based on BROND-2.2	*
Ir-193	BROND-2.2 for Ir-000	ENDF/B-VI.8	S	20	Newer isotopic evaluation (1995) partly based on BROND-2.2	*
Pt-000	ENDL-78 REV L	JEFF-3.0 + corr.	S	20	MF4 skeleton added	
Au-197	ENDF/B-VI (1984)	JEFF-3.0	S	20	= ENDF/B-VI.8	
Hg-196	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-198	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-199	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-200	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-201	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-202	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Hg-204	CENDL for Hg-000	JENDL-3.3	S	20	Isotopic evaluation	*
Tl-000	CENDL + modification	JEFF-3.0	S	20	-	
Pb-204	JENDL-3.2	New evaluation	S	200	NRG-2004	N
Pb-206	JENDL-3.2	New evaluation	S	200	NRG-2004	N
Pb-207	JENDL-3.2	New evaluation	S	200	NRG-2004	N
Pb-208	JENDL-3.2	New evaluation	S	200	NRG-2004	N
Bi-209	ENDF/B-VI.4	New evaluation	S	200	NRG-2004	N

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Ra-223	-	JENDL-3.3		20	-	n
Ra-224	-	JENDL-3.3		20	-	n
Ra-225	-	JENDL-3.3		20	-	n
Ra-226	-	JENDL-3.3		20	-	n
Ac-225	-	JENDL-3.3		20	-	n
Ac-226	-	JENDL-3.3		20	-	n
Ac-227	-	JENDL-3.3		20	-	n
Th-227	JENDL-3.2	JENDL-3.3		20	T-matrix deleted, small adj. 8 time groups	
Th-228	JENDL-3.2	JENDL-3.3		20	T-matrix deleted Small adjustments	
Th-229	JENDL-3.2 + modifications	JEFF-3.0		20	8 time groups	
Th-230	JEF-2.2	JEFF-3.0		20	-	
Th-232	JENDL-3.2+ENDF/B-VI.4	Maslov, Minsk	S	20	+ revisions, 8 time groups	*
Th-233	JENDL-3.2	JENDL-3.3		20	T-matrix deleted Small adjustments	
Th-234	JENDL-3.2	JENDL-3.3		20	T-matrix deleted Small adjustments	
Pa-231	JEF-2.2	JEFF-3.0		20	8 time groups	
Pa-232	-	ENDF/B-VI.8		20	More recent res parameters than JENDL-3.3	n
Pa-233	JEF-2.2	JEFF-3.0		20	-	
U -232	JEF-2.2+ENDF/B-VI.4	JEFF-3.0		20	8 time groups	
U -233	JENDL-3.2+ENDF/B-VI.4 +modifications	JENDL-3.3+ENDF/B-VI.4		20	+NRG correction, fuel cycle 8 time groups	*
U -234	JEF-2.2+ENDL-78	Maslov, Minsk	S	20	fuel cycle feedback 8 time groups	*
U -235	ENDF/B-VI.6+ + modifications	JEFF-3.0	S	30	New evaluation of CEA under study, 8 time groups	
U -236	JENDL-3.2+ENDF/B-VI.4	New evaluation		30	CEA, 8 time groups	N
U -237	JENDL-3.2+JEF-2.2 + modifications	New evaluation		30	CEA, 8 time groups	N
U -238	JEF-2.2+JENDL-3.2 +ENDF/B-VI.4+modific.	New evaluation	S	30	CEA, 8 time groups	N

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Np-235	-	JENDL-3.3	20	-		n
Np-236	JENDL-3.2	JENDL-3.3	20	-	T-matrix deleted Small adjustments	
Np-237	ENDF/B-VI.4+JEF-2.2 + modifications	JENDL-3.3	20	-	8 time groups	
Np-238	JEF-2.2+ENDF/B-VI.4	JEFF-3.0	20	-	8 time groups	
Np-239	ENDF/B-VI.4+JENDL-3.2 + modifications	JEFF-3.0	20	-		
Pu-236	JEF-2.2	JENDL-3.3	20	-	Newer resonance eval.	
Pu-237	JEF-2.2	JEFF-3.0	20	-		
Pu-238	JENDL-3.2+BROND-2.2 +ENDF/B-VI+modific.	JEFF-3.0	20	-	8 time groups	
Pu-239	JEFF-3.0	JEFF-3.0 updated	30	-	8 time groups	
Pu-240	JEFF-3.0	New evaluation	30	-	CEA, 8 time groups	
Pu-241	JENDL-3.2+modific.	JEFF-3.0	20	-	8 time groups	
Pu-242	JEFF-3.0	JEFF-3.0	20	-	8 time groups	
Pu-243	JEF-2.2	JEFF-3.0	20	-		
Pu-244	JEF-2.2	JEFF-3.0	20	-		
Pu-246	-	JENDL-3.3	20	-		n
Am-241	JEF-2.2 +modifications	New evaluation	20	-	CEA, JENDL-3.3 revised, new RR, 8 time groups	N
Am-242g	ENDF/B-VI.2+ENDL-78	JENDL-3.3	20	-		*
Am-242m	JEF-2.2+ENDF/B-VI +modifications	JENDL-3.3	20	-	8 time groups	*
Am-243	JEF-2.2 +modifications	JENDL-3.3	20	-	8 time groups	*
Am-244	JENDL-3.2	JENDL-3.3	20	-	T-matrix deleted Small adjustments	
Am-244m	JENDL-3.2	JENDL-3.3	20	-	T-matrix deleted Small adjustments	

Isotope	JEFF-3.0	JEFF-3.1	S	E	Justification/Comments	Change
Cm-240	-	JENDL-3.3	20	-		n
Cm-241	JEF-2.2 +modifications	JEFF-3.0	20	-		
Cm-242	JEF-2.2+JENDL-3.2 +ENDF/B-VI+modific.	JEFF-3.0	20	8 time groups		
Cm-243	JEF-2.2+JENDL-3.2 +ENDF/B-VI+modific.	JEFF-3.0	20	8 time groups		
Cm-244	JEF-2.2 +modifications	ENDF/B-VI.8	20	8 time groups		*
Cm-245	JENDL-3.2	JENDL-3.3	20	8 time groups		
Cm-246	JEFF-3.0	JEFF-3.0	20	8 time groups		
Cm-247	JENDL-3.2+JEF-2.2 + modifications	JEFF-3.0	20	-		
Cm-248	JENDL-3.2+JEF-2.2 + modifications	JEFF-3.0	20	8 time groups		
Cm-249	JENDL-3.2	JENDL-3.3	20	New evaluation		
Cm-250	JENDL-3.2	JENDL-3.3	20	New evaluation		
Bk-247	-	JENDL-3.3	20	-		n
Bk-249	ENDF/B-VI.4 + JEF-2.2	JENDL-3.3	20	Performs better		
Bk-250	JENDL-3.2 + modification	JEFF-3.0	20	-		
Cf-249	ENDF/B-VI.4 + JEF-2.2	JENDL-3.3	20	Processing problems for JEFF-3.0 and ENDF/B-VI.8, 8 time groups		
Cf-250	JEF-2.2	JENDL-3.3	20	Performs better		
Cf-251	JEF-2.2	JEFF-3.0	20	8 time groups		
Cf-252	JEF-2.2	JEFF-3.0	20	-		
Cf-254	JENDL-3.2 + modification	JEFF-3.0	20	-		
Es-253	-	JEF-2.2	20	More recent than ENDF/B-V		n
Es-254	JENDL-3.2	JENDL-3.3	20	T-matrix deleted, 8 time groups		
Es-255	JENDL-3.2	JENDL-3.3	20	T-matrix deleted		
Fm-255	-	JENDL-3.3	20	-		n