

Japanese Nuclear Data Activities in the Last 40 Years

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Nuclear data activities in Japan were started in 1963 by organizing Japanese Nuclear Data Committee (JNDC). Since then, JNDC and Nuclear Data Center which was established in Japan Atomic Energy Research Institute as Nuclear Data Laboratory in 1968 have made efforts to provide various kinds of information on nuclear data and to develop Japanese own evaluated nuclear data library (JENDL). Especially various versions of JENDL and JENDL special purpose files are excellent products of Japanese nuclear data activities.

The nuclear data activities in Japan started about 40 years ago. In 1963, two Japanese Nuclear Data Committees (JNDC) were organized in Japan Atomic Energy Research Institute (JAERI) and Atomic Energy Society of Japan (AESJ). They started work to develop theoretical calculation codes for unknown cross sections, and collaborations with international organizations. The optical model code ELIESE-1[1] is a result of the code development.

The Nuclear Data Laboratory which was a precursor of Nuclear Data Center (NDC) was established in JAERI in 1968. Full-scale evaluation work was started in 1970. In 1971, they discussed eagerly if they need their own evaluated nuclear data libraries. After long discussion, they decided to make own data library, Japanese Evaluated Nuclear Data Library (JENDL). A trial of data compilation began in the next year. During the test compilation of evaluated nuclear data file, computer codes needed for the compilation were developed.

The compilation work of JENDL-1 started in 1974. Results of nuclear data evaluation work made in JNDC were compiled in the ENDF format. JENDL-1 [2] was completed in 1976 and released in 1977 after benchmark tests. Since then, several versions of JENDL were released as listed in **Table 1**. Special purpose files listed in **Table 2** were also released so far. Nuclear data evaluation for those JENDL files was successfully performed under the collaboration among JAERI NDC and JNDC.

JNDC has a few subcommittees which consist of several working groups (WG). An example of JNDC structure is given in **Fig.1**, which is a JNDC in 1992 when they were making JENDL-3.2 [3]. The evaluation work was made by the WG's of the Nuclear Data Subcommittee, such as FP Nuclear Data WG, Heavy Nuclear Data WG and Gamma-ray Production Data WG. Those of Data for fusion reactors, Activation cross sections, PKA Spectra, Charged particles and Photonuclear data were organized for JENDL special purpose files. Benchmark tests of JENDL files were performed by WG's of the Reactor Constant Subcommittee.

For example, FP Nuclear Data WG made evaluation of nuclear data of FP nuclides; 28 nuclides for JENDL-1, 100 nuclides for JENDL-2, 172 nuclides for JENDL-3.1, and 63 nuclides for

JENDL-3.2. The WG members from NDC mainly performed jobs of theoretical calculations, comparison of calculated cross sections with experimental data, data compilations in the ENDF format and maintenance of computer codes. Other members made evaluation of resonance parameters, determination of model parameters, and benchmark tests.

The structure of JNDC was changed often to meet the circumstances. The number of JNDC members has been also changed as is shown in Fig. 1. It has a peak around 1990 to 1997, and has decreased recently. The number of JNDC meetings also has the same tendency. When JAERI dissolved at the end of last September, JNDC also disappeared once. New JNDC is going to be organized in Japan Atomic Energy Agency (JAEA). The new JNDC will be expected to be as quite active as old JNDC in the past.

References

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Table 1 JENDL general purpose files

Version	Year of release	Number of nuclides
JENDL-1 [1]	1977	72
JENDL-2 [4]	1982/1985	181
(JENDL-3 [5])	1989	171
JENDL-3.1 [5,6]	1990	304
JENDL-3.2 [3]	1994	340
JENDL-3.3 [7]	2002	337

Table 2 JENDL special purpose files

File name	JNDC WG*	Working year	Total years
Dosimetry File 91 [8]		1987 ~ 1991	4
Dosimetry File 99 [9]		1990 ~ 1999	9
Activation Cross Section File 96 [10]		1988 ~ 1996	8
Fusion File 99 [11]	none	1990 ~ 1999	9
FP Decay Data File 2000 [12]		~ 2000	
High-energy Files 2004 [13]		1993 ~ 2004	11
Photoreaction File 2004 [14]		1988 ~ 2004	16
(α ,n) Data Files 2003 [15]		1988 ~ 2003	15
(α ,n) Data Files 2005	none	2003 ~ 2005	2

*) WG for data evaluation. means a WG worked for the evaluation.

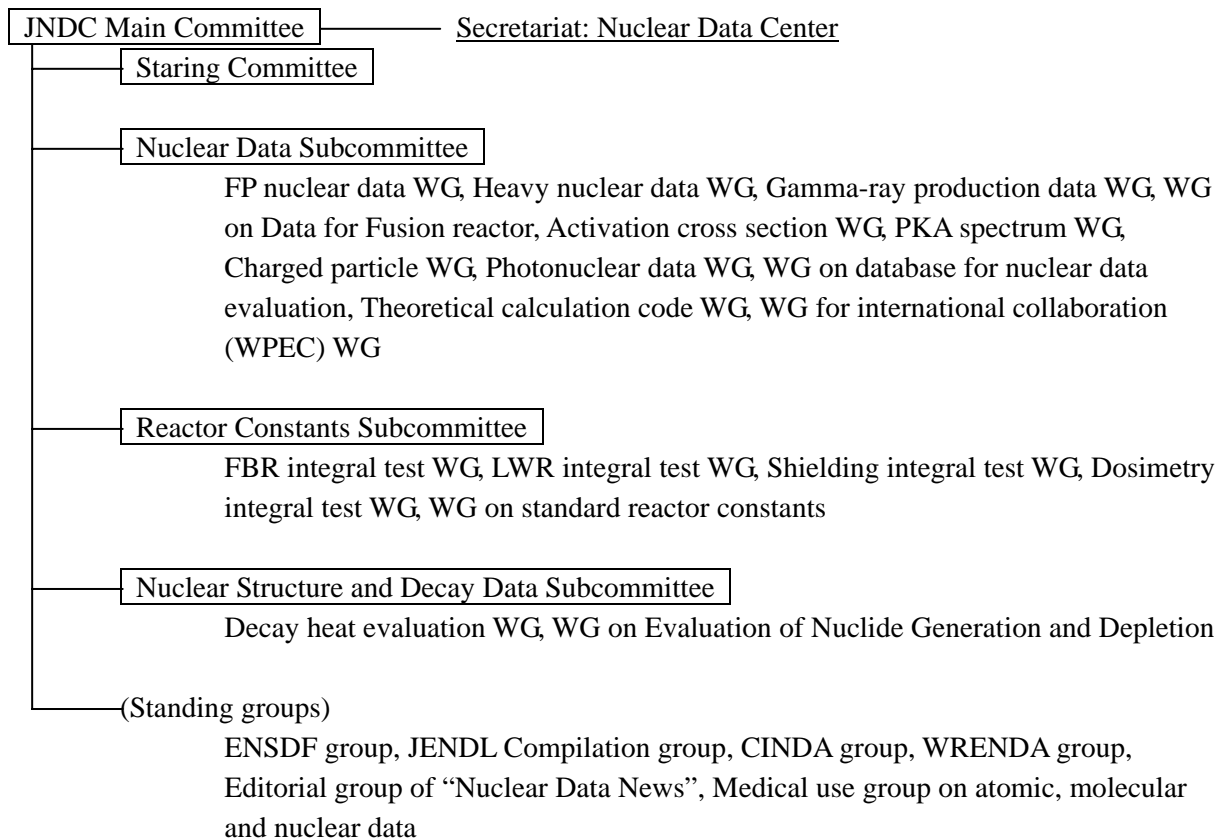


Fig.1 JNDC in 1992

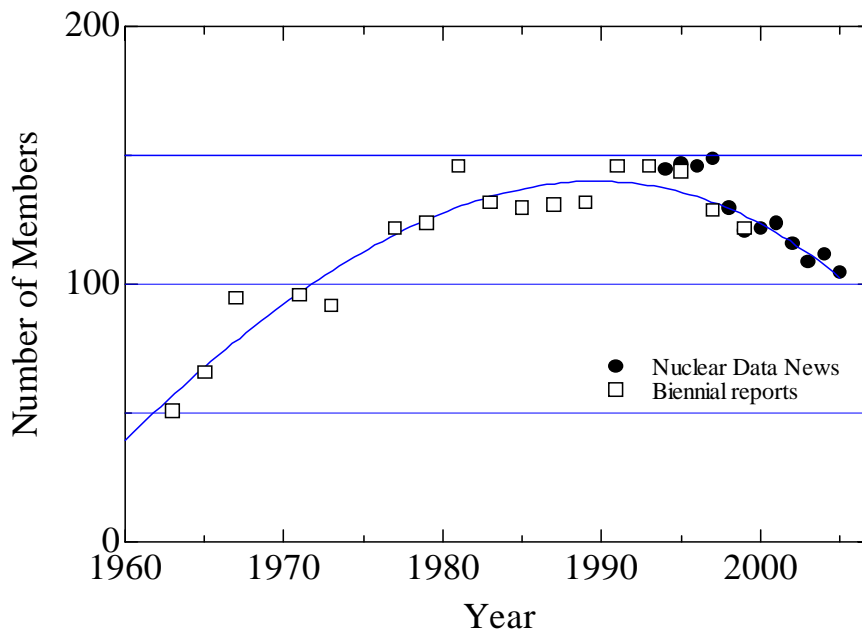


Fig.2 Numbers JNDC members

Data were taken from “Nuclear Data News” and biennial reports of JNDC.