1. **General**

Nuclear Data Center (NDC, former Nuclear Data Evaluation Lab.) of Korea Atomic Energy Research Institute (KAERI) has a director, 10 permanent staffs (2 in evaluation, 1 in measurement, 2 in atomic and molecular data, 2 in processing and validation, 3 in applications), one PhD student and one secretary. KAERI/NDC recently expanded its scope of work into the atomic and molecular data where two permanent staffs are involved. Mission of KAERI/NDC is disseminating outcomes of international network as well as promoting domestic nuclear data activities and related applications.

1.1 **Nuclear Data Needs**

Nuclear data needs are mainly from following major national nuclear R&D programs:

- **Advanced Reactor Development** (mainly Liquid Metal Fast Reactor) requires quantification of cross section uncertainties in their reactor designs.
- **Advanced Fuel Cycle** needs up-to-date neutron cross sections of MA and fission products
- **Korean TBM project** in ITER requires reliable neutron data of important materials for its neutronics analysis.
- **Accelerator projects** requires high energy neutron and charged particle nuclear data relevant to the radiological safety and beam application of the accelerators
- **Usual activities for the nuclear power plant operation, medical isotope production and the radioisotope applications**, are requesting up-to-date nuclear data
1.2 International Collaboration

To fulfill the above mentioned nuclear data needs in Korea, KAERI/NDC is performing nuclear data compilation/evaluation, processing and validation in close collaboration with the international nuclear data network, namely:

- Compilation of nuclear data into EXFOR under the guidance of IAEA/NDS
- Fusion Evaluated Nuclear Data Library CRP of IAEA
- Joining the formal JEFF and participating in WPEC subgroup of NEA
- Evaluation of nuclear data for Np-237, Pu-240, Cm isotopes with ORNL
- ENDF improvement (Zr isotopes and KERCEN) with BNL

2. EXFOR compilation

- The EXFOR compilation activity of KAERI/NDC is ongoing since 2009 under the guidance of IAEA/NDS.
- As of 2012, KAERI/NDC has produced 25 entries, consisting of experimental data for neutron total cross section, isomeric-yield ratio induced by bremsstrahlung, photo-fission yields, and the production cross section by proton induced reactions.

Table 1. Compilation statistics of KAERI/NDC

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3. Facilities

For measurement of nuclear reaction data, KAERI/NDC is coordinating measurements of *Pohang Neutron Facility* (PNF) of Pohang Accelerator Laboratory (PAL), *Van de Graff* laboratory of Korea Institute of Geosciences and Mineral Resources (KIGAM), and *MC-50 Cyclotron* at Korea Institute of Radiological and Medical Sciences (KIRAMS)

### 3.1 Pohang Neutron Facility of PAL (M.W.Lee, mwlee@knu.ac.kr)

- Measurement of total cross sections based on the TOF method using 50-70 MeV, 30-70 mA, 10-15 Hz beam
- Measurement of nuclear reaction using Bremsstrahlung gamma-ray
- Measurement of thermal neutron capture cross section and resonance integral
- Development of the BGO detector and the measuring software

**Specifications:**

Electron beam energy = 40 ~ 80 MeV
Repetition rate = 10~15 Hz
Pulse width = 1~2 μs
Peak beam current = 30~60 mA
TOF flight length =12 m
Target + water moderator to produce neutron pulse
Ta plates + cooling system
Detector: scintillator + PM tube, 12 BGO detectors
3.2 Van der Graff of KIGAM (G.D.Kim, gdkim@kigam.re.kr)

- Measurements of cross sections with neutron energies from 0.7 to 1.2 MeV for Ta, Co, Bi, Y, Nb, O, Si, Fe, Cu, Ti, Au
- Improving the beam bunching system

Specifications:
Based on Van der Graff with bunching and pulsing, Time pick up detecting system
Monoenergetic pulsed neutron beam energy = 500 keV ~ 6.5 MeV
Repetition rate = 4 MHz
Pulse width = 1~2 ns
$^7\text{Li}(p,n)$, $^3\text{H}(p,n)$ and D(d,n) reaction, with $10^6$~$10^8$ neutrons/sec and FWHM < 6%
Detector: two cylindrical plastic detectors (3"x1 cm)
TOF flight length = 4.18 m

3.3 MC-50 of KIRAMS (G.N.Kim, gnkim@knu.ac.kr)

- Measurement of proton-induced reaction cross-sections for $^{\text{nat}}\text{Sn}(p,x)$, $^{\text{nat}}\text{Zr}(p,x)$, $^{\text{nat}}\text{Ti}(p,x)$, $^{\text{nat}}\text{Pd}(p,x)$, $^{\text{nat}}\text{Ni}(p,x)$, $^{\text{nat}}\text{Al}(p,x)$, $^{\text{nat}}\text{Y}(p,x)$ reactions with 40 MeV proton irradiation

Specifications:
Azimuthally-Varying Field-Type MC-50 cyclotron
Proton beam energy: ~45 MeV
Beam current: < ~100 nA
Used for neutron therapy with Be(p,n) reaction and radioisotope production