Two Steps Forward, One Step Back
The Loss of Some Explicit Photon Production Data

- **Through-out the history of the ENDF/B project, we have seen issues where our separate efforts result in the loss of "good" data.**
  - This is an ongoing issue to which we must be ever vigilant.
- **The current case is the thermal capture photon production data produced during ENDF/B-VI.6 to ENDF/B-VI.8**
  - http://www-xdiv.lanl.gov/projects/data/nuclear/photon/thermal.html
  - Explicit capture lines from evaluated experimental data were added
    - H1, He4, Be9, N14, O16, F19, Na23, MgNat, Al27, Si28, Si29, Si30, SNat, S32,Cl35, Cl37, KNat, CaNat, Sc45, TiNat, VNat, Cr50, Cr52, Cr53, Cr54, Mn55, Fe54,Fe56, Fe57, Fe58, Ni58, Ni60, Ni61, Ni62, Ni64, Cu63, Cu65, W182, W183, W184, W186
- **In going from ENDF/B-VI to ENDF/B-VII**
  - H1, always an exception, switched back to the full 2.2246 MeV q-value rather than the reduced energy of 2.2233 due to energy transfer to the recoil; hydrogen is the only isotope for which the transfer of energy is large enough to effect the "seeable" gamma spectra.
  - During updates to the resonance evaluations for Al27, Cl35, and Cl37, the explicit data were kept for chlorine but lost for Al27.
  - In adopting isotopic evaluations in place of existing elemental evaluations, explicit data were lost for calcium, sulfer, potassium, and titanium.

Explicit Gamma Lines

- **There are a number of communities (oil well logging, threat reduction, PGAA, …) interested in having explicit gamma lines included within the ENDF/B database.**
  - These lines can then be simulated allowing better understanding of situations in which the use of gamma-ray line measurements feed into material identification efforts.
  - Because different reactions (capture, inelastic, …) can lead to the same lines, consideration should be given to efforts to enhance gamma production data generally.
- **There are at least two compilations of thermal capture gamma-ray lines available:**
  - http://www-xdiv.lanl.gov/projects/data/nuclear/photon/thermal.html
  - http://www-nds.iaea.org/pgaa/
- **ENSDF data can be used to help predict gamma lines from other reactions.**
- **Members of the CSEWG community are encouraged to provide more detailed gamma production data in their ongoing evaluation efforts.**