Release notes for ENDF/B Development n-088_Ra_224 evaluation

April 26, 2017

- `checkr` Warnings:

  1. A previous error halted parsing of the current section
     MAT=8828, MF= 1, MT=451 (1): Parsing stopped

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 1, MT=451
        SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      103 TO     144
     ```

- `checkr` Errors:

  1. A variable is outside the allowed ENDF range
     MAT=8828, MF= 1, MT=451 (0): Variable range

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 1, MT=451
        MOD =     1 OUT OF RANGE     0 -     0           RECORD NUMBER     103
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 2, MT=151 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 2, MT=151
        SECTION  2/151 NOT IN DIRECTORY                 RECORD NUMBER     146
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 3, MT= 1 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 3, MT=  1
        SECTION  3/  1 NOT IN DIRECTORY                 RECORD NUMBER     152
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 3, MT= 2 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 3, MT=  2
        SECTION  3/  2 NOT IN DIRECTORY                 RECORD NUMBER     187
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 3, MT= 4 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 3, MT=  4
        SECTION  3/  4 NOT IN DIRECTORY                 RECORD NUMBER     207
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 3, MT= 16 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 16
        SECTION  3/ 16 NOT IN DIRECTORY                 RECORD NUMBER     223
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=8828, MF= 3, MT= 17 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 17
   SECTION  3/ 17 NOT IN DIRECTORY                  RECORD NUMBER     232
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=8828, MF= 3, MT= 37 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 37
   SECTION  3/ 37 NOT IN DIRECTORY                  RECORD NUMBER     239
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=8828, MF= 3, MT= 51 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 51
   SECTION  3/ 51 NOT IN DIRECTORY                  RECORD NUMBER     244
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 52 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 52
   SECTION  3/ 52 NOT IN DIRECTORY                  RECORD NUMBER     260
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 53 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 53
   SECTION  3/ 53 NOT IN DIRECTORY                  RECORD NUMBER     275
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 54 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 54
   SECTION  3/ 54 NOT IN DIRECTORY                  RECORD NUMBER     290
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 55 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 55
   SECTION  3/ 55 NOT IN DIRECTORY                  RECORD NUMBER     305
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 56 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 56
   SECTION  3/ 56 NOT IN DIRECTORY                  RECORD NUMBER     319
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 57 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 57
   SECTION  3/ 57 NOT IN DIRECTORY                  RECORD NUMBER     333
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 58 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 58
   SECTION  3/ 58 NOT IN DIRECTORY                  RECORD NUMBER     346
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 59 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 59
   SECTION  3/ 59 NOT IN DIRECTORY                  RECORD NUMBER     359
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 60 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 60
   SECTION  3/ 60 NOT IN DIRECTORY                  RECORD NUMBER     371
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 61 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 61
   SECTION  3/ 61 NOT IN DIRECTORY                  RECORD NUMBER     383
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT= 91 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT= 91
   SECTION  3/ 91 NOT IN DIRECTORY                  RECORD NUMBER     394
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 3, MT=102 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 3, MT=102
   SECTION  3/102 NOT IN DIRECTORY                  RECORD NUMBER     405
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 4, MT= 2 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT=  2
   SECTION  4/  2 NOT IN DIRECTORY                  RECORD NUMBER     426
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 4, MT= 16 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 16
   SECTION  4/ 16 NOT IN DIRECTORY                  RECORD NUMBER     582
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 17 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 17
   SECTION  4/ 17 NOT IN DIRECTORY                  RECORD NUMBER     593
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 37 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 37
   SECTION  4/ 37 NOT IN DIRECTORY                  RECORD NUMBER     604
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 51 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 51
   SECTION  4/ 51 NOT IN DIRECTORY                  RECORD NUMBER     615
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 52 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 52
   SECTION  4/ 52 NOT IN DIRECTORY                  RECORD NUMBER     640
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 53 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 53
   SECTION  4/ 53 NOT IN DIRECTORY                  RECORD NUMBER     665
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 54 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 54
   SECTION  4/ 54 NOT IN DIRECTORY                  RECORD NUMBER     690
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 55 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 55
   SECTION  4/ 55 NOT IN DIRECTORY                  RECORD NUMBER     715
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 56 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 56
   SECTION  4/ 56 NOT IN DIRECTORY                 RECORD NUMBER     740
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 57 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 57
   SECTION  4/ 57 NOT IN DIRECTORY                 RECORD NUMBER     765
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 58 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 58
   SECTION  4/ 58 NOT IN DIRECTORY                 RECORD NUMBER     789
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 59 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 59
   SECTION  4/ 59 NOT IN DIRECTORY                 RECORD NUMBER     813
```

35. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 60 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 60
   SECTION  4/ 60 NOT IN DIRECTORY                 RECORD NUMBER     837
```

36. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 61 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 61
   SECTION  4/ 61 NOT IN DIRECTORY                 RECORD NUMBER     859
```

37. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 4, MT= 91 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 4, MT= 91
   SECTION  4/ 91 NOT IN DIRECTORY                 RECORD NUMBER     881
```

38. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 5, MT= 16 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 5, MT= 16
   SECTION  5/ 16 NOT IN DIRECTORY                 RECORD NUMBER     904
```

39. Missing a section in directory so your directory is messed up. This error will break everything else
MAT=8828, MF= 5, MT= 17 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 5, MT= 17
   SECTION  5/ 17 NOT IN DIRECTORY                 RECORD NUMBER     922
```

40. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 5, MT= 37 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 5, MT= 37
   SECTION  5/ 37 NOT IN DIRECTORY                 RECORD NUMBER     945
```

41. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=8828, MF= 5, MT= 91 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=8828, MF= 5, MT= 91
   SECTION  5/ 91 NOT IN DIRECTORY                 RECORD NUMBER     971
```

- `fudge-4.0` Warnings:

  1. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.96%
     ```

  2. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.11%
     ```

- `fudge-4.0` Errors:

  1. Found a negative probability
     reaction label 0: n + Ra224 / Product: n / Distribution: / angularTwoBody - XYs2d: (Error # 0): Negative prob.

     ```
     WARNING: Negative probabilities encountered. Incident energy: 2.e7 eV, worst case: -0.00433511903071
     ```

  2. Calculated and tabulated Q values disagree.
     reaction label 13: n[multiplicity:'2'] + Ra223 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -6263329.223510742 eV vs -6493490. eV!
     ```

  3. Calculated and tabulated Q values disagree.
     reaction label 14: n[multiplicity:'3'] + Ra222 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: -11421267.68035889 eV vs -1.16424e7 eV!
     ```

  4. Weights in a weighted sum don't sum up to one
     reaction label 14: n[multiplicity:'3'] + Ra222 / Product: n / Distribution: / uncorrelated - energy - weightedFunctionals: (Error # 0): Bad weight sum

     ```
     WARNING: Weights don't sum to 1.0!
     ```

  5. Calculated and tabulated Q values disagree.
     reaction label 15: n[multiplicity:'4'] + Ra221 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -18135219.43649292 eV vs -1.83591e7 eV!
```

6. Calculated and tabulated Q values disagree.
   reaction label 16: Ra225 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 5119936.472198486 eV vs 4888690. eV!
```

- `njoy2012` Warnings:

1. Evaluation has no resonance parameters given
   unresr...calculation of unresolved resonance cross sections (0): No RR

```
---message from unresr---mat 8828 has no resonance parameters
                         copy as is to nout
```

2. Evaluation has no resonance parameters given
   purr...probabalistic unresolved calculation (0): No RR

```
---message from purr---mat 8828 has no resonance parameters
                       copy as is to nout
```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 16
                         only mf4/mf5 provided
```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 17
                         only mf4/mf5 provided
```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 37
                         only mf4/mf5 provided
```

6. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

```
---message from conver---cannot do complete particle production for mt= 91
                         only mf4/mf5 provided
```

- `njoy2012` Errors:

  1. An angular distribution is negative
     acer...monte carlo neutron and photon data (0): Neg. P(Ejμ) (b)

```
---message from ptleg2---negative probs found
                          15 for mt=  2 e= 2.000E+07
```

- `acelst` Warnings:

  1. generic warning message
     0: Warning

```
ACELST WARNING - More than one range for MF/MT          6          16
ACELST WARNING - More than one range for MF/MT          6          17
```

  2. generic warning message
     1: Warning

```
ACELST WARNING - More than one range for MF/MT          6          37
STOP ACELST Completed
```