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Dear Journal of Nuclear Engineering and Design,

On behalf of my co-authors and myself, I am hereby submitting our manuscript, entitled `` *An Analysis on Mark-18A Target Irradiation History and Inventory of Plutonium and Heavy Curium*”, for publication in the *Journal of Nuclear Engineering and Design*.

This article provides a depletion and analysis study that models the irradiation history of the K-reactor core at the Savannah River Site (SRS) and the decay of isotopes to approximate the inventory of each individual target utilized during a Cf-252 production campaign. This work is being utilized to elucidate which assemblies should be processed first by SRS to recover Pu 244 and heavy curium.

This investigation includes very unique fuel geometries and compositions, in addition to an irregular power history with a very long shutdown time, providing for a unique depletion study utilizing the SCALE code.

I would like to emphasize to the editorial board and the reviewers that this article is being submitted as a product of a senior design project from the first four authors, co-sponsored by Savannah River National Laboratory (authors 5 and 6), under the mentorship and supervision of myself at NCSU.

We feel this work greatly adds to the scientific community and provides key insights into unique compositional variance as a function of time and power for advanced fuel concepts.

Sincerely,

Benjamin Beeler