the title

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INTRODUCTION

As we began developing advanced reactor programs and demonstrations, increasingly fueled by high assay low enriched uranium (HALEU), the issues of establishing an appropriate fuel cycle have come to the forefront. low enriched uranium (LEU) has been the standard for light water reactors, but as we look to advanced reactors, we must consider the implications of using HALEU and how to best implement it. One of the most pressing questions is whether we should enrich to low enriched uranium plus (LEU+) or HALEU. This work will explore the implications of each option.

One of the primary advantages for a fuel cycle containing LEU+ is that the facility to produce it would fall under the same licensing category as LEU fuel. The U.S. Nuclear Regulatory Commission (NRC) defines a *special nuclear material of low strategic significance* as meeting one of three criteria, the most notable of which for our purposes is "(3) 10,000 grams or more of uranium-235 (contained in uranium enriched above natural but less than 10 percent in the U–235 isotope)," [1]. This facility definition is where the upper limit of the LEU+ range arises.

To enrich to up to HALEU, facilities such as TRISO-X LLC and Kairos Power Atlas Fuel Fabrication Facility must move up a category to *special nuclear material of moderate strategic significance* (Category II). Thus, LEU+ is an attractive intermediary step for servicers wishing to minimize the size of a Category II facility (thereby reducing costs) as it is the same category we have historically licensed for LEU fuel enrichment.

THEORY

TABLE I. Deployment Schemes

Scheme	Description
Greedy Deployment	Deploy the largest reactor first at each time step, fill in the remaining capacity with the next smallest, and so on.
Random Deployment	Uses a date and hour as seed to sample the reactors list randomly.
Initially Random, Greedy Deployment	Randomly deploys reactors until a reactor bigger than the remaining capacity is proposed for each time step, then fills the remaining capacity with the greedy algorithm.

RESULTS AND ANALYSIS

Table II shows the various levels of enrichment for uranium that we will use in this work.

TABLE II. Enrichment levels and their ranges.

Enrichment Level	**Range [% ^{235}U]**
Natural	< 0.711
LEU	0.711-5
LEU+	5-10
HALEU	10-20

Subsection Goes Here (Heading B)

The user must manually capitalize initial letters of a subsection heading.

For those who like equations in their papers, LaTeX is a good choice. Here is an equation for the Marshak diffusion boundary condition:

$$4J^{-} = \phi + 2D\boldsymbol{n}\cdot\boldsymbol{\nabla}\phi\,. \tag{1}$$

If we so choose, we can effortlessly reference the equation later.

Another paragraph starts with Eq. (1) and sets J^{-} to zero, a vacuum boundary condition:

$$0 = \phi + \frac{2}{3}\frac{1}{\sigma}\boldsymbol{n}\cdot\boldsymbol{\nabla}\phi\,.$$

The extrapolation distance is $2/3$. A more detailed asymptotic analysis yields an extrapolation distance of about 0.71045.

CONCLUSIONS (HEADING A)

The included ANS style file and this clear example file are a panacea for the hours of headache that invariably results from formatting a document in Microsoft Word.

APPENDIX

Numbering in the appendix is different:

$$2 + 2 = 5\,. \tag{A.1}$$

and another equation:

$$a + b = c\,. \tag{A.2}$$

ACKNOWLEDGMENTS

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REFERENCES

1. NUCLEAR REGULATORY COMMISSION, “10 CFR § 70.4 Definitions.” (Aug. 2017).