

Security of HALEU at Fuel Cycle Facilities and In Transit

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Agenda

- Background
- Current NRC Approach
- Potential Supplemental Measures
- Conclusions

Background

- HALEU – high assay low enriched uranium
 - enrichments between 5% and 20%
- Categorization for Physical Protection Purposes
 - Category II - 10 Kg or more of U-235 (contained in uranium enriched to 10 percent or more but less than 20 percent)
 - Category III – less than 10 Kg but more than 1 Kg of U-235 (contained in uranium enriched to 10 percent or more but less than 20 percent)
 - Category III – 10 Kg or more of U-235 (contained in uranium enriched below 10 percent)

On-going Efforts

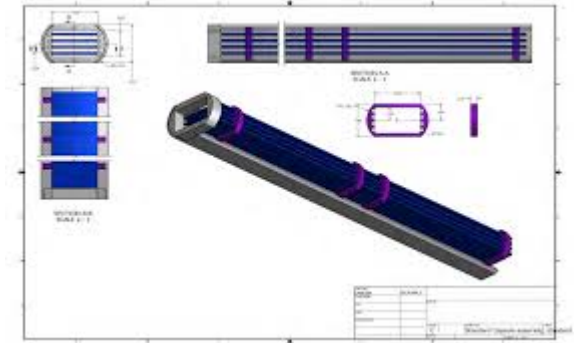
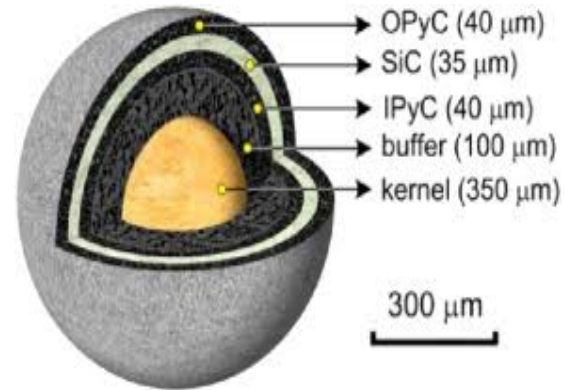
NRC Enhanced Security to Address Current Threat

- Issued Orders following 9/11
- Need to consider use of HALEU
- 2019 RIC Presentation - <https://www.nrc.gov/public-involve/conferencesymposia/ric/past/2019/docs/abstracts/sessionabstract-10.html>

NEI White Paper 2018 (ADAMS Accession No. ML18103A250)

Advanced Reactors and Associated Fuels

- Next-generation water-cooled reactors
- Non-water-cooled reactors
- Fusion reactors



Existing Physical Protection Requirements

- Category II quantities
 - 10 CFR 73.67(a), (b), (c), (d), and (e)
- Category III quantities
 - 10 CFR 73.67(a), (b), (c), (f), and (g)
- Protective Strategy
 - Minimize the possibilities for unauthorized removal of special nuclear material consistent with the potential consequences of such actions; and facilitate the location and recovery of missing special nuclear material.
- Applicable Guidance
 - Regulatory Guide 5.59, “Standard Format and Content for a Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance”

Current Approach

- Use a risk-informed analysis on a case-by-case basis
 - Consistent with SECY-06-0045 “*A Process for Security Assessments in the Future*”
- Use site-specific license conditions
- Ensure that requirements are fairly and reasonably applied
- Continue to interface with the interagency community

Potential Supplemental Measures – Fixed Sites

Applied on a case-by-case basis

- Better defined access controls (background checks)
 - Random entry searches
 - Greater control over material during use
 - Alarm station
 - Maintenance program
- ❖ Protected area
 - ❖ Armed guards
 - ❖ Expanded intrusion and detection

Potential Supplemental Measures – In Transit Applied on a case-by-case basis

- Transfers occur in controlled access area
- Increased key control
- Transport in closed and locked conveyance
- Increased searches
- Increased custody verification

Conclusion

- Use a risk-informed analysis on a case-by-case basis
- Use site-specific license conditions
- Ensure that supplemental security measures are fairly and reasonably applied