Westinghouse Traveller Transport Package Project Update

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Participants

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Our vision is to be the
first to innovate the next
technology, practice or solution that helps us help customers generate safer, cleaner, more reliable energy for more people and a better planet.

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Overview

- Introductions
- Traveller Criticality Safety Case Revision
  - Project Overview
  - Timeline
  - Licensing Schedule
  - Engineering Method and Analyses

Revision of the criticality safety case

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Traveller Package Rendering

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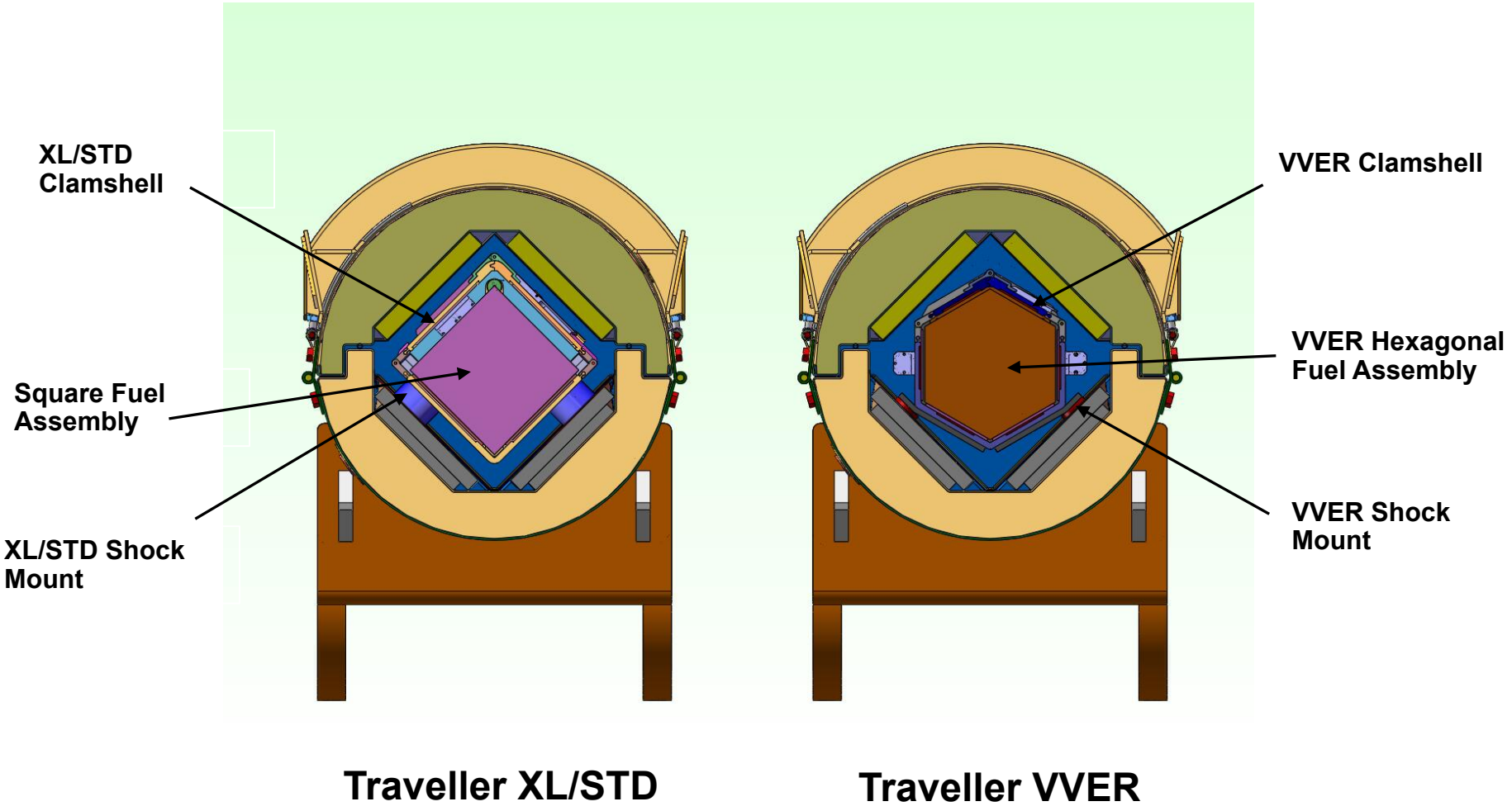
Traveller Package Designs



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Traveller (USA/9297/AF-96) CoC

USA Certificate	Rev.	Expiration	Description
Certificate of Compliance (DOT CAC Rev. 7)	9	31 March 2020	non-safety related parameter revision
Certificate of Compliance (DOT CAC Rev. 6)	8	31 August 2017	Traveller VVER design incorporated
Certificate of Compliance (DOT CAC Rev. 5)	7	31 October 2017	base approval for most validations

Request to maintain CoC Rev. 7 and Rev. 9 valid for an additional year

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Traveller (USA/9297/AF-96)

- Next amendment application will be the Traveller criticality safety case revision
  - Scheduled for January 2017
  - Will include rewrite of Ch. 6, and minor revisions to all other chapters as needed
- Important to maintain CoC Rev. 7 valid throughout the NRC review, thus may need another revision of the CoC to extend the expiration of CoC Rev. 7

Next Application – January 2017

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Traveller Criticality Safety Case Revision

- Criticality Safety Case Revision
  - Improve analysis method to be consistent with ANSI/ ANS-8.17-2004 method for establishing subcriticality
  - Update the computation code version for future flexibility
  - Respond to other Competent Authority RAIs
  - Develop consolidated fuel assembly parameters

Full Criticality Safety Case Revision

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Traveller Criticality Safety Case Revision

- Subcriticality established per ANSI/ANS-8.17-2004

  Maximum $k_{eff} \leq$ USL
  where: Maximum $k_{eff} = k_p + \Delta k_p + \Delta k_u$ and $USL = 1 - \Delta k_m - \beta - \Delta\beta$

- Addition of sensitivity studies (Δk_u) including:
  - geometric or material representations of transport conditions
  - material and fabrication tolerances
- Evaluation of USL including:
  - All biases, uncertainties, and administrative and/or statistical margins applied to a set of critical system benchmarks

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Traveller Criticality Safety Case Revision

- Development of conservative, consolidated fuel assembly parameters

Example:

Fuel Rod Array	14x14		15x15			
Assembly Type	1	2	1			2
No. of Fuel Rods	176	179	208			216
No. of Non-Fuel Cells	20	17	17			9
Nominal Fuel Rod Pitch (in)	0.580	0.556	0.568			0.550
Maximum Pellet Outer Diameter (in)	0.3812	0.3682	0.3622	0.3707	0.3742	0.3617
Minimum Fuel Rod Outer Diameter (in)	0.438	0.422	0.414	0.428	0.428	0.414
Minimum Clad Wall Thickness (in)	0.0245	0.0230	0.0220	0.0245	0.0230	0.0220

Reference: USA/9319/B(U)F-96