



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

Advanced Methods for Manufacturing

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Office of Nuclear Energy
U.S. Department of Energy**

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AMM Vision and Goals

■ Vision

- To improve the methods by which nuclear equipment, components, and plants are manufactured, fabricated, and assembled by utilizing 'state of the art' methods derived from other high tech industries.

■ Goal

- To reduce cost and schedule for new nuclear plant construction
- To make fabrication of nuclear power plant (NPP) components faster, less expensive, and more reliable



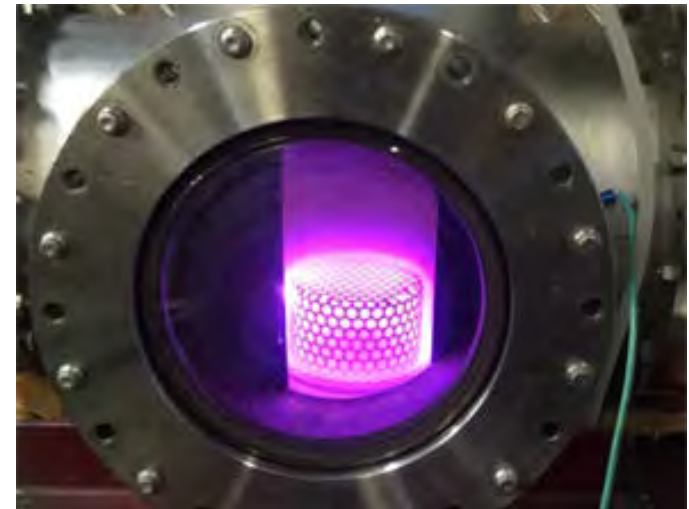
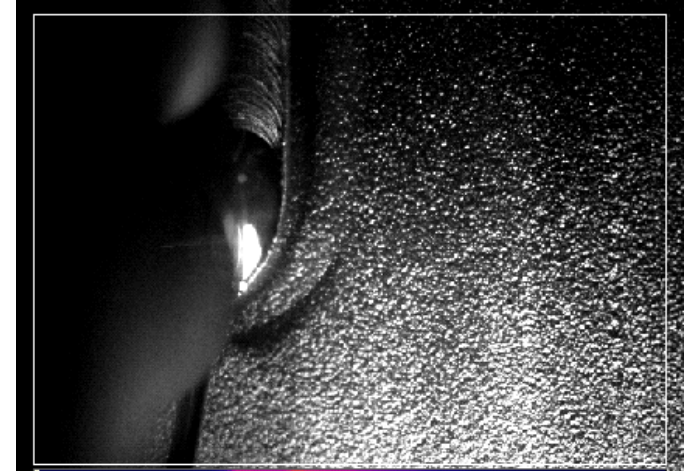
NEET-1 FOA Technical Focus Areas

- 1. Factory and Field Fabrication Techniques**
- 2. Advances in Manufacturing Processes for components**
- 3. Additive manufacturing techniques for advanced materials and multi-material components**
 - Including non-destructive examination (NDE) methods**
- 5. Development of in-situ quality control techniques to ensure quality high speed manufacturing**

Factory and Field Fabrication Techniques

■ Improvements in Fabrication Technologies

- Continue to improve on welding speed and quality in the fabrication environment
- Seeking new joining technologies for common applications
- Applying new surface modification (coating) techniques to make fabricated structures less susceptible to corrosion
- Improving the thru-put of shop floor and site operations



Advances in Manufacturing Processes for Components

■ Advances in component manufacturing processes

- Reactor internals, fuel cladding and fuel support assemblies
- Vessels, pressure boundary components
- Replacements or improvements for conventional manufacturing processes
- Cladding or surface modification methods
 - Corrosion and wear resistant applications for components

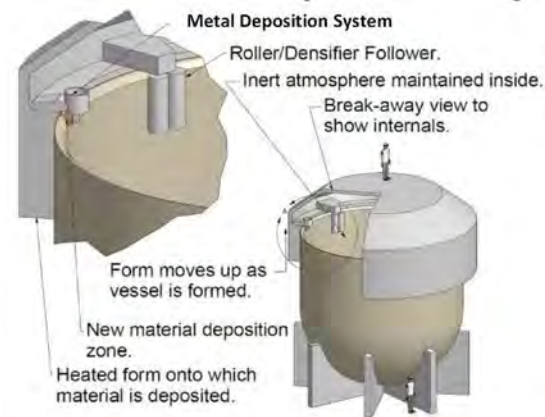




Additive Manufacturing

■ Advanced materials and multi-material components

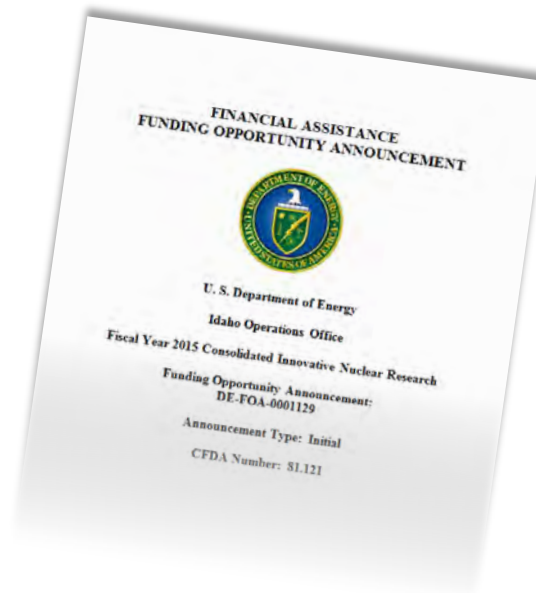
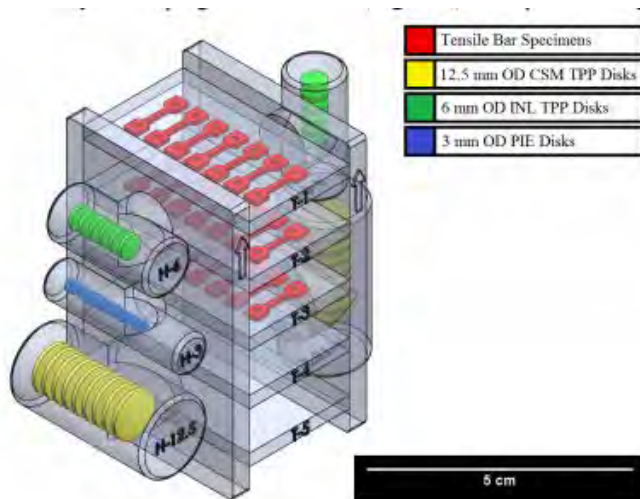
- Previously funded AM methods include:
 - Laser Powder Bed
 - Laser Deposition
 - Electron Beam Melting
 - In-situ monitoring
- Current materials under investigation are:
 - Stainless Steel
 - Inconel
 - ODS





NSUF-1.2c FOA Technical Focus Area

1. Advanced and innovative manufacturing techniques for irradiation testing to demonstrate performance





Summary of Expectations

- The technologies developed will **increase the reliability** of nuclear power plants while **decreasing the cost** of fabrication and construction
- The development of products and components will be able to **gain acceptance** by the appropriate regulatory or standard-setting bodies
- Specific products should be capable of being **deployed** in commercial nuclear power plants



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