

Mo-99 2017 — MOLYBDENUM-99 TOPICAL MEETING

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Y-12 CAPABILITIES AND EXPERTISE RELATED TO MO-99

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ABSTRACT

Y-12's core competencies center around the uranium production cycle: casting, breaking, machining, rolling, forming, swaging, annealing. Oxide production is another important aspect of Y-12's capabilities. Ceramic grade oxide for the High Flux Isotope Reactor (HFIR) and the National Bureau of Standards (NBSR) are manufactured at Y-12 currently. Boutique requests are filled as needed for other oxides as needed. Reference standards have been created here and can be done in the future.

Y-12 National Security Complex (Y-12), Argonne National Laboratory (ANL), and the University of Missouri (UM), Columbia worked in collaboration to qualify a high density low enriched uranium (LEU) monolithic target suitable for large scale production of Mo⁹⁹. This target utilized a monolithic annular fission target designed by ANL. This effort demonstrated the capability to produce a LEU monolithic target. Now in FY' 17 interest in the potential development of a domestic source of LEU dispersion plates has been raised. It is proposed in FY' 18 to produce targets which could be irradiated in domestic research reactors such as HFIR. The end goal of the project is to provide a licensing qualification package which can be utilized by current and prospective producers of Mo⁹⁹ for regulatory licensing and eventual adoption into their own production processes. The benefit of early target fabrication and irradiation would be the early start of batch plants to obtain Food and Drug Administration (FDA) approval. Batch plants could be licensed for production and enter low rate production while awaiting construction of their irradiation source (i.e. reactor or etc.). Additionally achieving higher manufacturing readiness levels (MRL's) will help integrate the supply chain quicker and ensure multiple target sources for continuity of the supply chain which invariably experiences delays and outages.