ENOUGH ALREADY: NO NEW LICENSES FOR HEU-BASED TC-99M

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2016 Nuclear Security Summit (1)

Joint Statement Signed by 22 Countries including the United States, and the Netherlands

Where technically possible convert existing molybdenum-99 (Mo-99) medical isotope production facilities to use 100% LEU targets by December 31, 2017

Goal Largely Being Met by Current Major Suppliers

- Curium (Netherlands) (Converting)
- NTP (South Africa) (Converted)
- IRE (Belgium) – (Converting)
- ANSTO (Australia) (Always LEU)

Amid decline in Mo-99 use

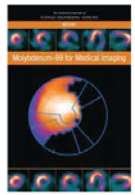
Demand for Mo-99/Tc-99m Drives Supply

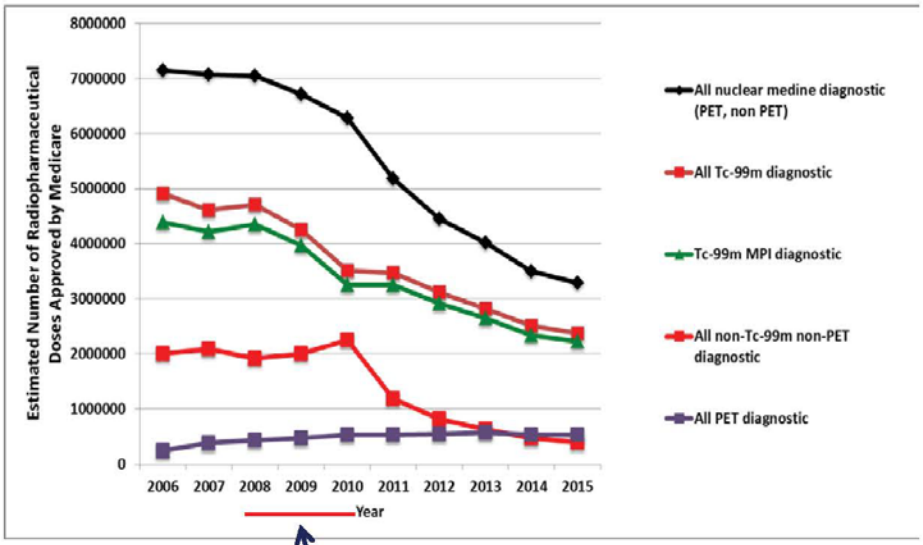
Decline in Tc-99m use in U.S. (and globally)

Some factors responsible for decline:

- More efficient use of Tc-99m
- Decreasing office-based medical imaging
- In U.S. introduction of Evidence Based Guidelines
- Increased preference for competing imaging modalities (PET/CT)

These factors will continue to operate in the future





Severe global shortages

Courtesy of
Dr. Kathryn Morton, University of Utah

But there's a potential new challenge: Russia (1)

- Not clear how much Russia producing—claims only 4% of market
- But current maximum capacity of 1300 6-day curies/week if produced equals:
  - 15% of Global Demand
- Current major production reactors at Dmitrovgrad and Obninsk use HEU targets (and HEU fuel). Claim to plan LEU conversion at some point.
- Sarov plans to produce Mo-99 with LEU in aqueous homogenous reactor

But there's a potential new challenge: Russia (2)

- Current Russian exports are to countries like Brazil and Iran
- Have also exported on a trial basis to Canada, India, the Philippines, Poland, and Saudi Arabia
- Have talked in past about wanting to claim 20 percent of global Mo-99 market
- If HEU-based production exported to more markets, risks undermining shrinking market for existing or new producers because of lower costs of such production

Need to invoke another 2016 Nuclear Security Summit pledge

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Consistent with international trade agreements and the schedules of the major Mo-99 producers to convert to LEU targets, and subject to applicable domestic laws, ***end imports and exports of HEU-based Mo-99 unless*** *the members of the Organization for Economic Cooperation and Development's Nuclear Energy Agency High Level Group on the Security of Supply of Medical Radioisotopes deem that the licensed global non-HEU production capacity of Mo-99 and its daughter product Tc-99m have become insufficient and unsustainable.*

Supported by US National Academies of Sciences Report

Molybdenum-99 for Medical Imaging (2016)
Recommendation:

U.S. Congress: Restrict or place financial penalties on the import of Mo-99 produced with HEU targets after Mo-99 produced without HEU targets becomes widely available for commercial sale in the United States.

Block New Licenses for Generators Made from HEU-based Mo-99

- As one remedy, US Congress and European governments could prohibit medical authorities from approving licenses for any generator produced with HEU targets
- Would avoid trade (WTO) challenge because universal
- Would not affect transition for current manufacturers