Technical Considerations in Production Expansion

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July 2017
Reliable Supply of Mo-99
Reactor Space & Scheduling

- Require irradiation positions with appropriate flux
- Need to allow for other irradiations
  - Ensure extra irradiations do not disturb other products
  - NTD silicon
Building Services

- Ventilation, Alarms, Power supply etc
- Back-up systems
  - Stand-by fans
  - UPS, back-up generators
- Maintainable without affecting production
  - Consideration as to access
In Cell Equipment

• Redundant equipment
  – Install two pieces instead of one

• Remotely maintainable

• Replaceable without affecting production
Waste

- Handling and storage of waste
  - Major consideration
    - Liquid and Solid
    - Intermediate and Low Level
- Decisions on:
  - In-cell storage
  - Waste tank storage
  - Transfer
  - Treatment
  - Shielding requirements
  - Separation from product
Waste Management

BASEMENT

Final gas filters

Xenon delay columns

Gas delay tanks

Waste tanks

Short term waste tanks
Plant Emissions

- Major consideration
- Maintain with regulatory limits
  - Limits don’t change with increased production
- Radioactive noble gases
  - Active or passive trapping
  - Tighter restrictions in future
- Radioiodines
  - Prevent emissions?
  - Measures in real time?
  - Manufacture I-131 as a by-product?
Target Density

• Most LEU targets are in the range of 2-6-2.7 g/ccU

• Small increase in target density could give a significant increase in yield
  – Possible with current technology if cladding thickness reduced
  – New technologies being developed
Demand Profile

• Demand for Mo-99 not steady over week

• Need to design plant for large throughput days
Thank you