U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Construction Permit Application Review SHINE Medical Technologies

Safety Panel 2

December 15, 2015

Panelists

- **Steven Lynch**
  - **Project Manager, NRR**
- **Joseph Staudenmeier**
  - **Senior Reactor Systems Engineer, RES**
- **Kevin Morrissey**
  - **Project Manager, NMSS**

Review Methodology

- **Two methodologies applied to SHINE accident analyses**
  - **Maximum hypothetical accident**
  - **Integrated safety analysis**
- **Radiological and chemical hazards evaluated against 10 CFR Parts 20 and 70, respectively**

Irradiation Facility Accident Analysis

- **Irradiation facility characteristics:**
  - **Operates at low power, pressure, and temperature**
  - **Large heat sink for passive decay heat removal**
  - **Radiological sources**

Event Identification

- **Delineation of possible accident categories**
- **Identification of limiting accident for the category**
- **Strategy to mitigate accident and limit consequences**
- **Analysis of dose consequences**

Safety Concept

- **Detection of high radiation levels**
- **Confinement of radiation source**
- **Evacuate workers**
- **Filter releases to environment**
- **Emergency planning zone could be the operational boundary**

Limiting Accident

- **Release of irradiated target solution from one TSV**
- **Consequences bounded by RPF maximum hypothetical accident**
- **Meets 10 CFR Part 20 limits**
  - **5 rem for workers**
  - **100 mrem for public**

Production Facility Accident Analysis

- **Radiological and chemical accident analysis performed**
- **Defines facility hazards and controls that support establishment of design basis**

Production Facility Accident Analysis

- **Multiple event types:**
  - **Radiological accidents**
  - **Chemical accidents**
  - **Criticality accidents**
  - **Fires**
  - **External events**