Dry Cask Storage
Radiation Protection Programs

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INTRODUCTION

- Utilities have extensive experience and programs in place to ensure operations are ALARA, this includes cask loading
- Cask Loading Dose
- Continuous Improvement

ALARA PLAN

- Cask Loading Activities meet the criteria for additional dose controls including an ALARA plan.

  Jobs with a total dose of greater than 250mrem
- These plans will require review by an ALARA committee
- Extensive planning and a review of controls is included, some examples are included on the next slide

ALARA Planning and Controls

- Shielding
- Remote Monitoring
- Low Dose Waiting areas
- Use of Best Qualified Craft/Crew Size
- Team Integration
- Tools and Mockups
- Work Bundling
- Work Area (Scaffolding
- Remote Tooling and/or Robotics

Radiation Work Permit

- Total Dose Estimate
- Alarms for Dose Rate Field and Total Dose
- Requirements for additional monitors
- Contamination Controls
- Post Job Review
- Requirements for Radiation Protection Coverage
- High Radiation Area Entry Requirements including a specific High Radiation Area Job Brief
- Trip Tickets

Work Management/Planning

- Starts at 28 weeks prior to activity
- Multiple reviews at various points, many include Radiation Protection
- Each job has a specific dose goal and the goals are tracked daily and weekly
- Goals that are not met either under or over are entered into the Corrective Action Program and review of why the goal was not met is performed

Radiation Protection

- Dedicated Radiation Protection Coverage is required during removal of items from the Spent Fuel Pool
- Additional Monitoring required for any entry into a High Radiation Area
- RWP/Procedures may impose additional controls or times when Radiation Protection Personnel must be present

Cask Loading Dose

- Cask FSAR's include dose estimates based on design basis type fuel, 3-5 years cooling, 60,000-75,000 MWD/MTU
- These estimates are typically around 2000 mrem total dose for a cask loading
- A number of cask users are loading casks for between 200-500 mrem total. Some are higher and some are lower

Cask Dose Rates

- Cask FSAR's contain estimates of cask dose rates, based on design basis fuel
- Some sites have site specific cask dose rate estimates
- Actual Dose Rates measured during loading even on casks with reduced shielding have been found to be lower than the predicted numbers

Continuous Improvement

- INPO & Station Goals based on the ALARA principles drive sites to look for every opportunity to improve dose performance
- Contracts for cask loading services include incentive/penalties for dose performance
- Continuous Improvement Programs that require 100% participation
- Cask Vendors and those that provide cask loading services continue to make improvements thus increasing their market share