

Public Radiation Safety

Ralph L. Andersen, CHP
Senior Director – Radiation Safety & Environmental Protection



Public Radiation Safety Cornerstone

The objective of this cornerstone is to ensure adequate protection of public health and safety from exposure to radioactive material released into the public domain as a result of routine civilian nuclear reactor operations. These releases include routine gaseous and liquid radioactive effluent discharges, the inadvertent release of solid contaminated materials, and the offsite transport of radioactive materials and wastes. Licensees can maintain public protection by meeting the applicable regulatory limits and ALARA guidelines.



Primary Regulatory Limits

- 100 mrem/yr TEDE from licensed sources (10 CFR Part 20)
- 25 mrem/yr total body; 75 mrem/yr thyroid; 25 mrem/yr other organs from fuel cycle operations (40 CFR 190)
- Limits on external dose rates and contamination levels for radioactive material transportation (49 CFR 173)



ALARA Guidelines

- The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA) (10 CFR Part 20)
- 3 mrem/yr from liquid releases; 10 mrad/yr from gaseous releases from nuclear power plants (Appendix I to 10 CFR 50)



4

Inspection

- **Baseline Inspection Procedures**
 - Radiation Monitoring Instrumentation
 - Radioactive Gaseous and Liquid Effluent Treatment
 - Radiological Environmental Monitoring Program
 - Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation
- Temporary Instruction on Follow-up on the Industry's Ground Water Protection Initiative



5

SDP Criteria Greater-Than-Green

- **RAM Control: >5 mrem**
- **Effluents: >Appendix I guideline or "Failure to implement program"**
- **Transport/Disposal: >2x radiation limit; >5x contamination limit or significant non-compliance issues**



6

Public Radiation Safety Performance Indicator

- To assess the performance of the radiological effluent control program
- Occurrences that exceed 1.5 mrem/qtr (liquid effluents); 5 mrad/qtr (gaseous effluents) and other ALARA criteria
- Includes **all** liquid and gaseous releases



7

Radiation Dose to the Public

- >NRC Dose Limit (100 mrem): Zero
- >EPA Fuel Cycle Standard (25 mrem): Zero
- >SDP Dose Criteria (5 mrem/App I): Zero
- >Appendix I Effluent Guideline (ALARA): Zero
- >Performance Indicator Criteria: Zero



8

White Inspection Findings

- Failure to perform timely dose assessment
- Transport radiation limits exceeded
- Disposal site non-conformance



9

Observations

- Real dose to real people has been maintained below limits and guidelines
- Applicable limits for transportation have not always been met
- PI only covers radiological effluent programs
- New rules may lead to changes in oversight



10
