



ESH & QA



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Discussion Topics

Neutron Quality Factor Task Team Report

- This Task Team was charged at the Nov. 29 EFCOG RP Subgroup meeting to:
 - Provide the RP Subgroup with recommended guidance for implementation of modified neutron dose methods required in 10CFR835 as amended 6/8/2007 that is consistent with ICRP 60 recommendations
 - Include sufficient detail that allows consistent implementation across the complex

The Team

- **Neutron Quality Factor Task Team Members:**
 - **Ken Crase, SRS (Chair)**
 - **Dan Strom, PNNL**
 - **Ken Veinot, Y-12**
 - **Radoslav Radev, LLNL**
 - **Don Cossairt, FNAL**
 - **Tom McLean, LANL**

(Neutron dosimetry subject matters experts)

Recommendations

- **Use Operational Quantities for Neutron Dose Determination:**
 - **Personal Dose Equivalent $H_p(10)$ at 0 degrees for neutron (and beta/gamma) dosimeter calibrations**
 - ICRP 74, p. 182, Table A.24 for photons
 - ICRP 74, p. 200, Table A.42 for neutrons
 - **Ambient Dose Equivalent $H^*(10)$ for instrument calibrations**
 - ICRP 74, p. 200, Table A.42 for neutrons
 - **For facility design dose calculations use $H_p(10)$ at 0 degrees**
 - ICRP tables for $H_p(10)$ referenced above

Impact of Recommendations

- **Photon doses do not change, and there is no need to change the way photon measurement instruments are calibrated**
- **Neutron doses are increased by 21% for bare Cf and moderated Cf spectra**
 - **Some spectra may see larger or smaller increases (17%-34%)**
- **Instrument calibrations increase by somewhat smaller amounts ($H^*(10)$ goes up 17% for bare Cf source)**
- **Introduces need to verify work place neutron doses are conservative compared to Effective Dose (E)**

Advantages of Recommendations

- **Consistent implementation of new neutron dose methods across complex**
- **Consistent with recommendations of ICRP, ICRU and consistent with ISO standards**
- **Keeps neutron dosimeter calibrations traceable to source strength calibrations (NIST, etc.)**
- **Likely to be consistent with how DOELAP will implement changes to bare and moderated Cf dose methods**

- **Validation that personnel dose assignment methods are conservative compared to E (Effective Dose)**
 - **SRS and others are looking at measurement and calculational tools to assist in these evaluations**
 - **These efforts will require guidance down the road**

Summary

- **Straight-forward recommendations consistent with ICRP recommendations**
- **Detailed recommendation document in progress by Task Team**
- **Guidance must be carefully worded to avoid conflict with definitions and requirements in 10CFR835**