USE OF THE EPA 400 PAG METHODOLOGY IN DOE/NNSA EMERGENCY MANAGEMENT PROGRAMS

QUESTION: DOE O 151.1C requires that the Protective Action Guides (PAGs) promulgated by the EPA (EPA 400-R-92-001 or "EPA 400") be used as the Protective Action Criteria (PACs) for radioactive material releases. However, in 2007, an amendment to 10 CFR 835, *OCCUPATIONAL RADIATION PROTECTION*, was issued that required a change (by 7/8/2010) in the measure used for reporting *occupational* doses from Total Effective Dose Equivalent (TEDE) to Total Effective Dose (TED). TEDE is calculated using International Commission on Radiation Protection (ICRP) 26/30 methodologies and certain tissue weighting factors to arrive at the whole body dose. TED is calculated using ICRP 60/68 methodologies and uses different radiation weighting factors and tissue weighting factors.

Although the current EPA 400 PAGs are based on ICRP 26/30 guidance, which uses TEDE as the dose measure to be compared with the PAGs, an ongoing (~ 10 year) effort to revise EPA 400 is expected to incorporate the TED and ICRP 60/68 methodology. Until a revised document is formally issued, however, can DOE/NNSA sites still use the current version of EPA 400 in their emergency plans?

ANSWER: DOE O 151.1C requires that the Protective Action Guides (PAGs) promulgated by the EPA be used as the Protective Action Criterion (PAC) for radioactive material releases. The DOE Emergency Management Guide (EMG), DOE G 151.1-2, Appendix F, which also addresses this requirement, was issued in the same time frame as a 10 CFR 835, *OCCUPATIONAL RADIATION PROTECTION*, amendment that required a change (by 7/8/2010) in the measure used for reporting ***occupational*** doses from Total Effective Dose Equivalent (TEDE) to Total Effective Dose (TED). TEDE is calculated using ICRP 26/30 methodologies and certain tissue weighting factors to arrive at the whole body dose. TED is calculated using ICRP 60/68 methodologies and uses different radiation weighting factors and tissue weighting factors (ICRP 60/68 has not only changed the values for certain organs, but also added some organs to the list not on the ICRP 26/30 list). In addition, the 2007 amendment to 10 CFR 835, uses dose conversion coefficients based on an ***occupational*** exposure scenario of a worker inhaling 5 micron activity median aerodynamic diameter (AMAD) size particles. Offsite environmental and emergency management models typically use a 1 micron AMAD particle size.

The terminology was changed from TEDE to TED in 10 CFR 835 to make DOE regulations compatible with the guidance from ICRP 60/68. The changes specifically address assessing ***occupational*** doses to workers and the public inside controlled areas. EPA has started using the ICRP 60/68 dose terminology in its recent publications and it is expected that, when the revision of the EPA 400 PAG document is complete, it will include the ICRP 60/68 terminology as well.

The EPA 400 PAGs and dose projections conducted in support of emergency management applications are not used to assess ***occupational*** doses, but instead are used when determining event classification and protective actions in emergency situations. The current EPA 400 PAGs are based on ICRP 26/30 guidance, which uses TEDE as the dose measure to be compared with the PAGs.

DOE sites and facilities can still use EPA 400 as it currently exists in their emergency plans until the revised document is issued formally. The compelling factor for determining whether a site uses the ICRP 60/68 dose model prior to the release of the revised EPA PAG manual should be compatibility with the consequence assessment model results produced by offsite response authorities and not simply compatibility with ***occupational*** radiation reporting requirements according to 10 CFR 835. Although a common model for all functional requirements that involve dose estimates is a desirable choice for a site, the emergency management Order requires that consequence assessments must be "...coordinated with Federal, State, local, and Tribal organizations." Coordination is most effective and efficient when consequence calculations are performed using the same assumptions and dose models. Therefore, DOE sites and facilities can still use the current version of EPA 400 in their emergency plans to ensure compatibility of dose estimates with calculations performed by offsite authorities.