

Savannah River Site SEC Update Co-Worker Models (ORAUT-OTIB-0081)

SEC00103

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Co-worker Models (ORAUT-OTIB-0081)

- Multi-Radionuclide Co-Worker Models
 1. Tritium (H^3)
 2. Plutonium (Pu)
 3. Uranium (U)
 4. Mixed Fission Products (MFP)/Strontium-90
 5. **Exotic Radionuclides (Am, Cm, Cf, Th)**
 6. Neptunium (Np)
 7. Cesium-137
 8. Cobalt-60
- Demonstration nuclides for ABRWH evaluation are bolded



Co-Worker Strata

- Co-worker Implementation Guide indicates that known differences in monitoring or work types should be stratified.
- As a result, Construction Trades Workers (CTW) need to be stratified from operations workers.
 - CTW's were identified via one method for Exotic Radionuclide (Am, Cm, Cf, Th) (ORAUT-RPRT-0055)
 - Different criteria was used for the Tritium co-worker models. ORAUT-RPRT-0049, ORAUT-RPRT-0050.
- We had to go back and use the same criteria for both co-worker models and all future models.



Co-worker Models (ORAUT-OTIB-0081)

- Co-worker Implementation Guideline requires evaluation of dataset used in model.
- DCAS established acceptable transcription error rates
 - Less than 1% error on critical fields (analytical results)
 - Less than 5% error on all critical and non-critical fields combined (analytical results, name, payroll ID, sample date, sample type, etc...)
- ORAU developed a sampling plan to evaluate error rates within these parameters.



Exotic Radionuclide Evaluation

- 37,461 analytical results (critical fields)
 - Sampled 2866 critical fields and compared to hard copy records for transcription errors
 - 38 critical field errors or 1.33% - **failed**
 - 95th% Confidence Interval (0.96%, 1.79%)
- 229,342 non-critical fields
 - Sampled 16,354 fields compared to hard copy records for transcription errors
 - 152 non-critical field errors or 0.93% - **passed**
 - 95th% Confidence Interval (0.79%, 1.08%)



Exotic Radionuclide Evaluation

- 100% line by line validation comparison conducted for analytical results (critical fields) and corrections made when discrepancies were identified.
- Resample
- 38,054 analytical results
 - Sampled 2864 critical fields and compared to hard copy records for transcription errors
 - 7 critical field errors or 0.24% - passed
 - 95th% Confidence Interval (0.11%, 0.49%)



Tritium (H³) Evaluation

- 260,278 analytical results (critical fields)
 - Sampled 3131 critical fields and compared to hard copy records for transcription errors
 - 9 critical field errors or 0.29% - passed
 - 95th% Confidence Interval (0.13%, 0.54%)
- 780,834 non-critical fields
 - Sampled 624 fields compared to hard copy records for transcription errors
 - 3 non-critical field errors or 0.48% - passed
 - 95th% Confidence Interval (0.10%, 1.40%)



Status

- Exotic Radionuclide (Am, Cm, Cf, Th) dataset has passed QA check, the model using TWOPOS is being developed.
- Tritium dataset is trailing as one of the underlying datasets (Mixed Fission Products MFP) used for strata identification only recently failed QA check.
 - Subsequent QA check of strata identification of compiled tritium dataset is necessary.
- Anticipate delivering these two completed models to the SEC Issues workgroup in July before the ABRWH meeting in August.

