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 (H³)
  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...)
- ORAUA 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
    - 95\textsuperscript{th}% Confidence Interval (0.11%, 0.49%)
Tritium (H\textsuperscript{3}) 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
    - 95\textsuperscript{th}% 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
    - 95\textsuperscript{th}% 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.