37th Tritium Focus Group  
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Area G presently stores four FTWCs above grade shipped to Area G in May 2007
Annotated Plot of Affected Buildings in Area G
• AL-M1 containers
• Squib valves contaminated with both Lead Oxide and Tritium
• Galvanized paint cans containing various Tritium contaminated waste
FTWCs loaded into four 49 CFR 504 compliant, stainless-steel, 85-gallon over pack drums
FTWCs in 85-Gallon Drums
FTWC Storage

Hazardous Material Shed with FTWCs
70,000 Ci then
45,000 Ci now
Total all 4 FTWCs
Containers Loaded:

1) Above the LANL waste acceptance criteria limit of 25% water by weight of molecular sieve

2) Bolts on all four containers are loaded above yield strength
• 8/25/16 PISA containers greater than 4% (LEL) for hydrogen, could be 60%

• Incorrect bolts were used to secure the FTWC lids and that the bolts were over-torqued
The contents of the gas mixture are expected to be as follows:

- 3 PSIA from helium as tritium decay products
- 11.2 PSIA from venting to atmospheric pressure just prior to final sealing
- 70 PSIA of buildup hydrogen and oxygen gas from radiolysis reaction
• Internal ignition source is initiating event of
• Concern for hydrogen explosion accident sequence. The stainless-steel AL-M1
• Containers, squib valves, and other galvanized steel containers within the FTWCs present
• Potential ignition sources if moved and jostled together with enough force to create an
• Approximate 20 mJ spark. For this reason, movement of the FTWCs is prohibited
D = MAR * DR * ARF * RF * LPF * DCF * BR * χ/Q95%

Where:

D = Dose (rem)
MAR = Material-at-Risk (curies of tritium)
DR = Damage Ratio (1.0)
ARF = Airborne Release Fraction (1.0)
RF = Respirable Fraction (1.0)
LPF = Leak Path Fraction (1.0)
DCF = Dose Conversion Factor (100 rem/Ci accounts for 1.5 skin dose factor;
DOE-STD-1129-2015)
BR = Breathing rate (m3/sec) = 3.33 E-4 (from DOE-STD-5506-2007)
### Unmitigated Dose from FTWC Explosion Events

<table>
<thead>
<tr>
<th>Scenario</th>
<th>MAR (Ci)</th>
<th>Public</th>
<th>Co-located Worker</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>(\chi/Q_{95%})</td>
<td>Dose (rem)</td>
</tr>
<tr>
<td>1 Drum, No Decay</td>
<td>83,600</td>
<td>4.34E-4</td>
<td>1.21</td>
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<tr>
<td>2 Drums, No Decay</td>
<td>165,500</td>
<td>4.34E-4</td>
<td>2.40</td>
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<tr>
<td>1 Drum, Decay</td>
<td>49,900</td>
<td>4.34E-4</td>
<td>0.72</td>
</tr>
<tr>
<td>2 Drums, Decay</td>
<td>98,500</td>
<td>4.34E-4</td>
<td>1.43</td>
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<tr>
<td>Accident</td>
<td>Likelihood</td>
<td>Consequence</td>
<td>Risk</td>
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<tr>
<td>Explosion of a Single FTWC</td>
<td>A</td>
<td>L</td>
<td>L</td>
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<tr>
<td>Explosion and One Sympathetic</td>
<td>U</td>
<td>M</td>
<td>L</td>
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• PHASE 1: Safing the situation

• PHASE 2: Remediation of the hazard