In this scenario, the attacker reconfigures the cascades piping to enrich material above declared levels. Material is fed through the re-piped section daily for the duration of the attack scenario. Because the attacker is enriching to levels higher than declared, the amount of material produced is less the nominal mass, the mass that would be expected under standard operating conditions. The mass discrepancy between the nominal mass and mass produced under this misuse scenario depends on the duration of the diversion and the product enrichment the attacker chooses.

The amount of product produced per unit time by a certain number of cascades at an enrichment facility is given in equation 26.

|  |  |
| --- | --- |
|  | (26) |

Where:

P [kg/day] = product flow rate

n = number of cascades— [1, 6, 30 cascades]

*CASC* = total cascades at facility— [60 cascades]

SWU [kg/day] = plant capacity— [1292 SWU/day]

*xf* = feed enrichment – 0.00711

*xp* = product enrichment – 0.045 (under normal operating conditions)

*xw* = tails enrichment – 0.0022

Let *P* denote the nominal daily product mass flow at the enrichment plant under normal operating conditions, and let *P’*and *xp’* denote the daily product mass flow and product enrichment under anomalous operating conditions, respectively. Then the daily product mass produced under anomalous conditions is given by equation 25, and equation 26 gives the total mass missing on any day, *t*, of the simulation. It is assumed that all of the missing product mass is missing from one cylinder in product storage.

|  |  |
| --- | --- |
|  | (25) |

Where:

P [kg/day] = anomalous product flow rate

n = number of cascades re-piped— [1, 6, 30 cascades]

*CASC* = total cascades at facility— [60 cascades]

SWU [kg/day] = total plant capacity— [1292 SWU/day]

*xf* = feed enrichment – 0.00711

*xp* = product enrichment – [0.197, 0.50, 0.90]

*xw* = tails enrichment – 0.0022

|  |  |
| --- | --- |
|  | (26) |

Using this formulation for the missing mass, the DP for this scenario can be calculated using equation 7.