

A WEB TOOL FOR A REAL TIME FOLLOW UP OF A CRITICALITY ACCIDENT IN A NUCLEAR FUEL FACTORY

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In the factory that ENUSA owns at Juzbado, enriched uranium is handled, therefore there is risk of a criticality event in the facility. For that reason, in the emergency plans and procedures, the tools for the mitigation of the consequences of such an accident are included.

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Categoría de estabilidad: Velocidad del viento a 10 m (m/s): Distancia al centro de la nave de fabricación en m.:

Tiempo desde inicio accidente en segundos: Caudal de emisión (m³/s):

Introducing

- Weather data (category of stability, wind speed,
- Distance
- Time Elapsed

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Actividad emitida desde el inicio en Bq

Gas nobles: 2.9266 · 10¹²
 Todos: 8.0327 · 10¹³

Dosis efectiva total acumulada desde el inicio (respirar e inmersión en agua) en mSv

0.00032469

Concentración instantánea (Bq m⁻³) y tasas de dosis (mSv/h)

Isótopos	Coef(Bq m ⁻³)	E _q	Tiroides (mSv/h)	E _q	Electrica (mSv/h)	EE inmersión (mSv/h)	E _q	piel(mSv/h)
Kr83m	108.873	0.	0.	0.	5.87912 · 10 ⁻⁰²	1.39511 · 10 ⁻⁰⁴		
Kr85m	107.248	0.	0.	0.	2.88797 · 10 ⁻⁰²	8.64847 · 10 ⁻⁰⁴		
Kr85	0.0011476	0.	0.	0.	1.91632 · 10 ⁻⁰²	5.45339 · 10 ⁻⁰⁴		
Kr87	078.022	0.	0.	0.	0.000100564	0.0003344		
Kr88	418.137	0.	0.	0.	0.000166485	0.000229995		
Kr89	8374.57	0.	0.	0.	0.	0.		
Ni133m	0.0573608	0.	0.	0.	8.03281 · 10 ⁻¹¹	9.95325 · 10 ⁻⁰²		
Ni133m	1.3015	0.	0.	0.	6.41898 · 10 ⁻⁰⁹	4.8728 · 10 ⁻⁰⁴		
Ni133	19.807	0.	0.	0.	1.11236 · 10 ⁻⁰⁷	3.54387 · 10 ⁻⁰⁷		
Ni135m	1145.84	0.	0.	0.	0.000084092	0.000122428		
Ni135	245.086	0.	0.	0.	0.000113056	0.000028083		
Ni137	11369.1	0.	0.	0.	0.	0.		
Ni138	6441.84	0.	0.	0.	0.0013381	0.0024814		
I131	1.56413	0.000281543	0.000013898	1.02482 · 10 ⁻⁰⁷	1.678 · 10 ⁻⁰⁷			
I132	187	0.000135336	0.000021726	0.0000756807	0.000107544			
I133	28.4588	0.000095965	0.0000014053	3.02263 · 10 ⁻⁰⁴	4.90385 · 10 ⁻⁰⁴			
I134	758.133	0.000210298	0.0000039592	0.000145446	0.0000496911			
I135	84.8346	0.000589269	0.0000025765	0.0000243713	0.0000338999			
Total	30003.6	0.00236701	0.000188903	0.00215393	0.00384301			

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Allows to know the external dose rate and inhalation risk in specific spots at every moment in case of criticality events

Gives

- Dose rate
- Integrated dose
- Emitted activity

CONCLUSION

With this tool it is possible to calculate the doses and dose rate at every moment in a criticality event. The tool is customized for the use in the factory of Juzbado and has included the characteristics of the facility. With this data it is easier to decide the characteristics of an intervention

