

# 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: **A** | Velocidad del viento a 10 m (m/s): **3.5** | Distancia al centro de la nave de fabricación en m: **500**  
 Tiempo desde inicio accidente en segundos: **1000** | Caudal de emisión (m<sup>3</sup>/s): **0.123**

Introducing

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

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Actividad emitida desde el inicio en Bq

Gases Nobles:  $2.9266 \cdot 10^{12}$   
 Iodos:  $8.01327 \cdot 10^{11}$

Dosis efectiva total acumulada desde el inicio (Tiriodes e inmersión en agua) en mSv:  $0.00034569$

Concentración instantánea(Bq/m<sup>3</sup>) y tasas de dosis (mSv/h)

Isotopos	Conc(Bq/m <sup>3</sup> )	Eq. Tiriodes (mSv/h)	Efectiva (mSv/h)	Eq. inmersión (mSv/h)	Eq. pin(mSv/h)
Kr81m	106.873	0.	0.	$5.87912 \cdot 10^{-10}$	$1.39531 \cdot 10^{-8}$
Kr85m	107.248	0.	0.	$2.88797 \cdot 10^{-8}$	$8.64847 \cdot 10^{-8}$
Kr85	0.0011476	0.	0.	$4.91632 \cdot 10^{-13}$	$5.45339 \cdot 10^{-11}$
Kr87	678.022	0.	0.	0.000100564	0.0003344
Kr88	458.837	0.	0.	0.000188485	0.000223995
Kr89	8374.57	0.	0.	0.	0.
Xe131m	0.6873608	0.	0.	$8.03281 \cdot 10^{-11}$	$9.95325 \cdot 10^{-10}$
Xe131m	1.3015	0.	0.	$8.41898 \cdot 10^{-8}$	$4.8728 \cdot 10^{-8}$
Xe133	19.807	0.	0.	$1.11236 \cdot 10^{-7}$	$3.54387 \cdot 10^{-7}$
Xe135m	1148.94	0.	0.	0.000084092	0.000122428
Xe135	248.096	0.	0.	0.0000110568	0.0000289893
Xe137	11369.1	0.	0.	0.	0.
Xe138	6441.84	0.	0.	0.0013381	0.0024814
I131	1.56413	0.000281543	0.0000138995	$1.02482 \cdot 10^{-7}$	$1.678 \cdot 10^{-7}$
I132	187.7	0.00015336	0.0000211726	0.0000756807	0.000106764
I133	28.5585	0.000895968	0.0000514053	$3.02263 \cdot 10^{-8}$	$5.99385 \cdot 10^{-8}$
I134	738.133	0.000230298	0.0000398592	0.000345446	0.0000486911
I135	84.8346	0.000580269	0.0000327685	0.0000243713	0.0000338999
Total	30003.6	0.00236701	0.000158903	0.00215393	0.00384301

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Gives

- Dose rate
- Integrated dose
- Emitted activity

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

## 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**

