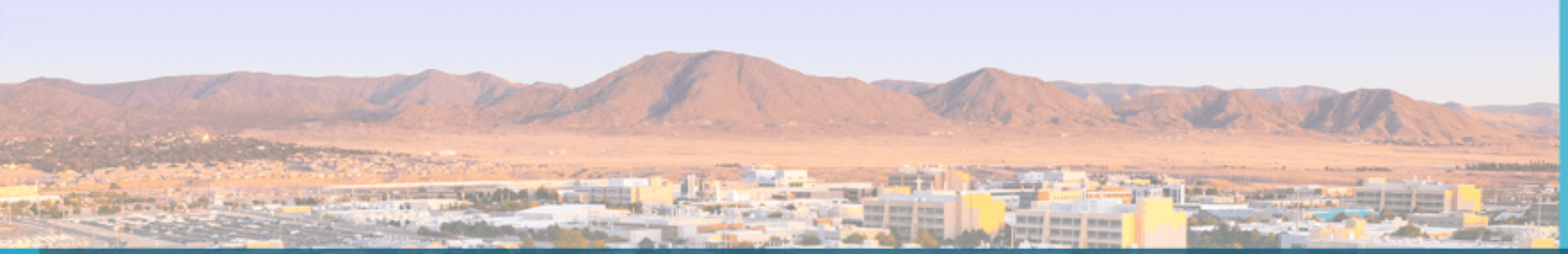

Sandia National Laboratories

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1st CRP Response Exercise Results

Lainy Cochran & Brian Hunt

IAEA Coordinated Research Project (CRP) J15002
Research Coordination Meeting

28 June – 2 July 2021

U.S. DEPARTMENT OF ENERGY | NNSA

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1st Emergency Response Exercise

Atmospheric dispersion performed by Lawrence Livermore National Laboratory (LLNL) National Atmospheric Release Advisory Center (NARAC)

Derived Response Level (DRL) calculations performed by SNL Assessment Scientists using Turbo FRMAC

Contoured dose rates correspond to the U.S. Environmental Protection Agency (EPA) Protective Action Guide (PAG) of 1 rem (0.01 Sv) in the first four days (Early Phase)

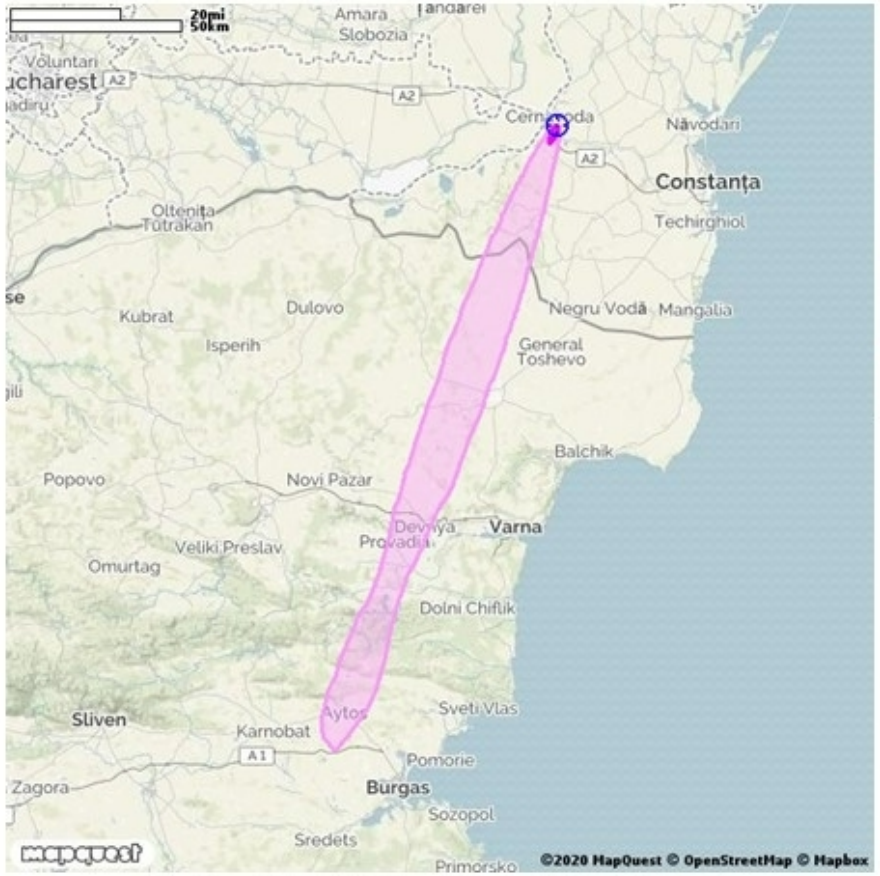
- “Total Dose” includes both plume and ground exposure pathways, under the assumption that there would be time to evacuate the population prior to arrival of the plume
- “Avoidable Dose” includes only ground exposure pathways, under the assumption that there would NOT be time to evacuate the population prior to arrival of the plume

An Evaluation Time of 48 hours after the start of the release was assumed to allow for complete deposition from the 36-hour release

EXERCISE EXERCISE EXERCISE

CRP Exercise 1
Automated Report - Testing

Evacuation/Sheltering Area based on Projected Total Effective Dose (Groundshine and Air Immersion Dose Rate at 11/19/2020 08:40:00 UTC)



Map Size: 266 km by 266 km **Id:** ProductionT.rcE34651.rcC1
NARAC Operations: (NARAC Staff); narac@llnl.gov; 925-424-6465

Effects and Actions

	Description	(mrem/hr) Extent Area	Population
	Early phase avoidable dose (1 rem)	>10.3 5.7km 7.1 km2	500
	Early phase total dose (1 rem)	>0.5 203km 2,513 km2	125,000

Areas and counts in the table are cumulative. Population Source = LandScanGlobal2015.

Effects or contamination at November 19, 2020 08:40 UTC
Release Location: 44.322927 N, 28.056445 E
Material: CS-137 + I-131 + XE-133
Generated On: November 18, 2020 18:36 UTC
Model: ADAPT/LODI
Comments: Release starting at 11/17/2020 08:40:00 UTC for 1 day 12 hr 20 min canned met at 11/17/2020 09:00:00 UTC

EXERCISE EXERCISE EXERCISE

OIL and DRL Comparison for 1st Emergency Response Exercise

Dose Pathways	U.S. DRL	IAEA Default OIL1
Including plume dose	5 μSv/h	N/A
Not including plume dose	103 μSv/h	1000 μSv/h

U.S. DRLs are scenario-specific and calculated at a relevant Evaluation Time for an assumed radionuclide mixture so that field measurements can be compared to a DRL that is corrected for decay and weathering

Primary difference between calculated DRL and IAEA Default OIL1 is factor of 10 between U.S. PAG (0.01 Sv) and IAEA Generic Criteria (0.1 Sv)

Thank You

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