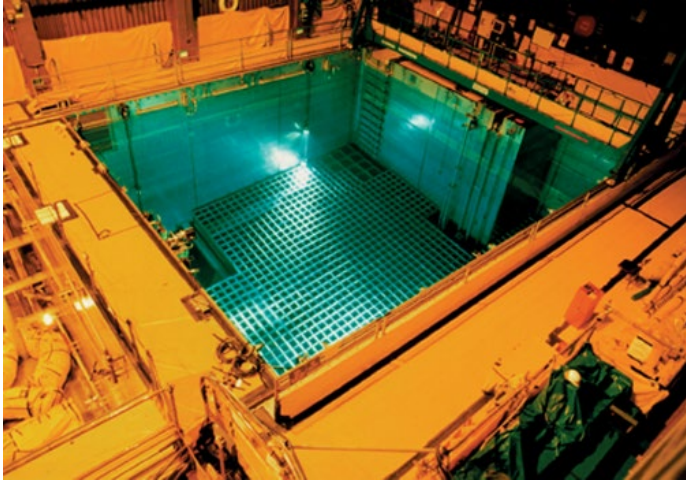


# SPENT FUEL POOL DRAINED

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Part of the RASCAL Instructor-led Training

## RASCAL CAN MODEL 3 TYPES OF SPENT FUEL ACCIDENTS.



1. Spent fuel pool drained
  - Hot gap -> Cladding Fire
2. Fuel assembly damaged underwater
  - Cold gap



3. Damage to fuel stored in dry casks
  - Cold gap

## SPENT FUEL - SCENARIO



The Diablo Canyon, Unit 2, power plant has experienced a loss of water level in the spent fuel pool due to an earthquake.

The licensee reports it is the result of a large crack in the pool and postulates that the water is possibly flowing into a sink hole.

Due to a malfunctioning pump, the operators have not been able to make up for the loss of water in the spent fuel pool.

## SPENT FUEL - SCENARIO

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Estimates are that the fuel will be fully uncovered sometime this morning, and that if there is no ability to recover the fuel then a fire could start at 0900 tomorrow morning.

The licensee also reports that the pool currently contains 3 batches of fuel; 1 of which was from the most recent refueling 360 days ago, and 2 from previous refuelings. Flex equipment is expected to be in operation by 1100 tomorrow morning to provide additional water.

The fuel building has been severely damaged and is in many places directly open to the atmosphere. Assume the release point to be unfiltered, 10 meters above ground and use Standard Meteorology & ICRP 26/30.

# YOUR TURN TO USE RASCAL



## Given the scenario excerpt below, run the entire case in RASCAL.

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	Activity (Ci)	Percent of Total (%)
Noble gas		
Iodines		
Other		
Total		

Dose	Distance from the Release		
	1 mile	5 miles	10 miles
TEDE (rem)			
Adult Thyroid CEDE (rem)			

**LET'S WALK THROUGH THE PROBLEM TOGETHER**



## SPENT FUEL - RESULTS

	Activity (Ci)	Percent of Total (%)
<b>Noble gas</b>	8.7E+04	13
<b>Iodines</b>	4.2E-08	0
<b>Other</b>	5.8E+05	87
<b>Total</b>	6.7E+05	100

Dose	Distance from the Release		
	1 mile	5 miles	10 miles
<b>TEDE (rem)</b>	2.6E1	6.2	3.1
<b>Adult Thyroid CEDE (rem)</b>	1.6E1	4	2

- EPA PAGs exceeded +10 mi (TEDE), 3 mi (Thyroid)

## KNOWLEDGE CHECK



- This model will predict if a fire will start in the spent fuel pool (T/F).
  - True
  - False
- If the date of the last refueling changed to 30 days vice the 360 days used, how does that change the doses projected?
  - Larger doses
  - Smaller doses
  - About the same
- If you had a potassium iodide (KI) program, would you recommend using KI for the initial scenario?
  - Yes
  - No