RADIATION SHIELDING PROPERTIES OF HOUSEHOLD APPLIANCES

AN ANALYSIS OF THE VIABILITY OF THE 'INDIANA' MANEUVER

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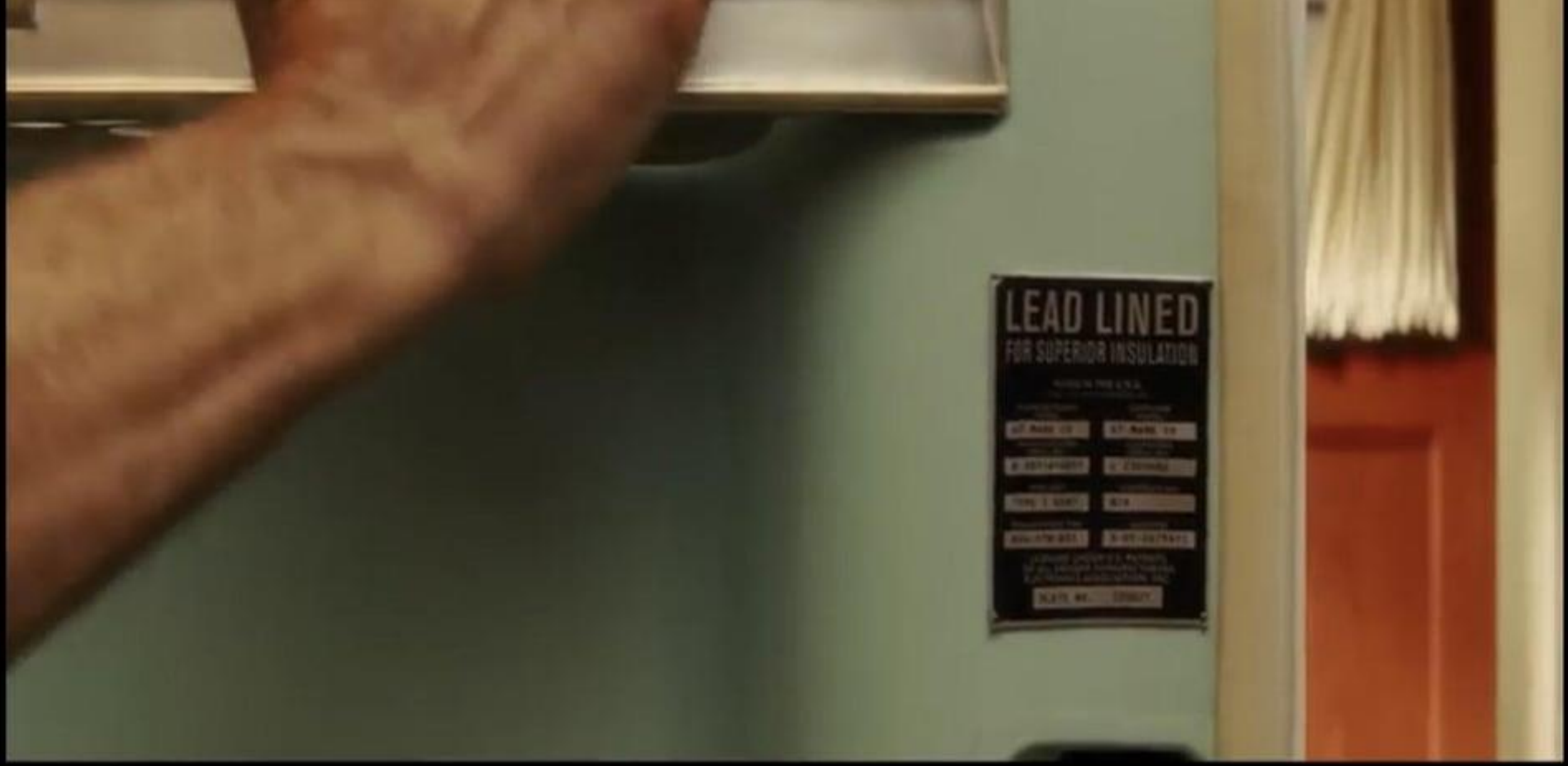

Certified nuke-proof? The answer is....

No.

(Sorry, George Lucas).

Maybe modern-day fridges work better?

….but what about....

?

BACKGROUND RESEARCH:

Refrigerator:

- Actually *emits* radiation rather than shielding it
- No longer lined with lead
- ..but even if it was, Bremsstrahlung
- Lightweight materials

Microwave

- Designed to be an effective radiation shield - not because the microwaves are harmful, but because that would be a waste of energy
- Can act as a Faraday cage
- Does not emit radiation when not in use

HYPOTHESIS:

"Placing a Cosmic Watch Detector inside a refrigerator will have a negligible impact on the measured count rate of cosmic rays compared to housing it in a microwave oven, which is designed with radiation shielding for energy efficiency."

METHODOLOGY:

1. Measurement of the background rate
2. Control/Fridge measurement
3. Fridge measurement, coincidence mode
4. Microwave/Fridge measurement
5. Microwave measurement, coincidence mode

DATA COLLECTION PROCEDURE:

Recording the Count Rate:

- Power on one of the detectors via the connection of the USB cable and a power source.
- Place one of the scintillator detectors within the refrigerator.
- Press the reset button on the detector and allow the detector to collect readings for at least 1 hour.
- Record the count rate and label the file(s) appropriately by removing the data from the SD card.

DATA COLLECTION PROCEDURE:

After collecting the data from a single detector, two detectors will be used where one is the master and the other the slave.

Connect the two detectors via the 3.5 mm male-male audio cable.

Choose which detector will be the master and the other the slave; make note of which detector is which.

Press the reset button on the detector that will be made the master, then approximately 0.2-1 s later press the reset button on the slave detector.

To ensure that there was a proper configuration between the master and slave, the LED should be flashing at 1-2Hz on the master and the LED on the slave should almost never be flashing.

Press the reset button on the detector and allow the detector to collect readings for at least 5 minutes.

Transfer the files from the SD card to a PC. Ensure the slave contains significantly fewer data points than the master.

QUESTIONS?