

DI40N10-06232004-zddinfo2.doc

Eric Jameson - DI40 neutron analysis

From: "RO Rushton" <rorushton@hopewelldesigns.com>
To: "Eric Jameson" <EJameson@dnr.state.ga.us>
Date: 06/23/2004 14:37
Subject: DI40 neutron analysis

Dear Eric,

Attached is the summary of the radiation analysis for the DI40-N-10. As you will note in the email, this work was done by Dave Seagraves at LANL using MCNP code. The email has the summary of the data. I have not included the printout from the MCNP code, which is around 30 pages.

Let me know if you need anything else. Thanks in advance for your help.

Sincerely,

R.O.

R.O. Rushton
Hopewell Designs, Inc.
5940 Gateway Drive, Alpharetta, GA 30004
(770) 667-5770, FAX (770) 667-7539
RORushton@HopewellDesigns.com

Seagraves Email Neutron Calcs.txt
From: "David T. Seagraves" <dseagraves@lanl.gov>
To: <rorushton@hopewelldesigns.com>
Cc: <dick@lanl.gov>
Subject: MCNPX Calculations for Neutron EPD Irradiator
Date: Tuesday, February 03, 2004 2:24 PM

R.O. Rushton,

As per your request, I have performed leakage calculations using MCNPX. The model of the Neutron EPD Irradiator was created using your furnished drawings (D140 Irradiator) and conversations. The MCNPX model includes the polycast shielding and the secondary shielding. No other aspects of the drawings were modeled (see attached file ro-epd-shield.pdf).

Two separate MCNPX calculations were performed. One with the neutron dose rate (epd1.o) and the other with the gamma dose rate (epd4.o). Both of these files are attached for your records.

Four type f5 tallys (point detectors) were placed in the model at locations you had requested. Refer to the file ro-epd-shield.pdf for the tally locations.

Results of the MCNPX calculations are as follows:

| Tally # | Neutron (mrem/h) | Gamma (mR/h) | total | total, 5 Ci |
|-------------------------------|------------------|--------------|-------|-------------|
| case 1 f5 (case 1) | 0.61 | 0.11 | .72 | 3.60 |
| f15 (case 4) | 0.26 | 0.047 | .307 | 1.535 |
| f25 (case 3) | 1.89 | 0.17 | 2.06 | 10.3 |
| f35 (case 2) | 0.055 | 0.024 | .079 | .395 |

These dose rates correspond to an activity of 1 Ci of AmBe-241.

If you have any questions, please call me.

Thanks,

Dave

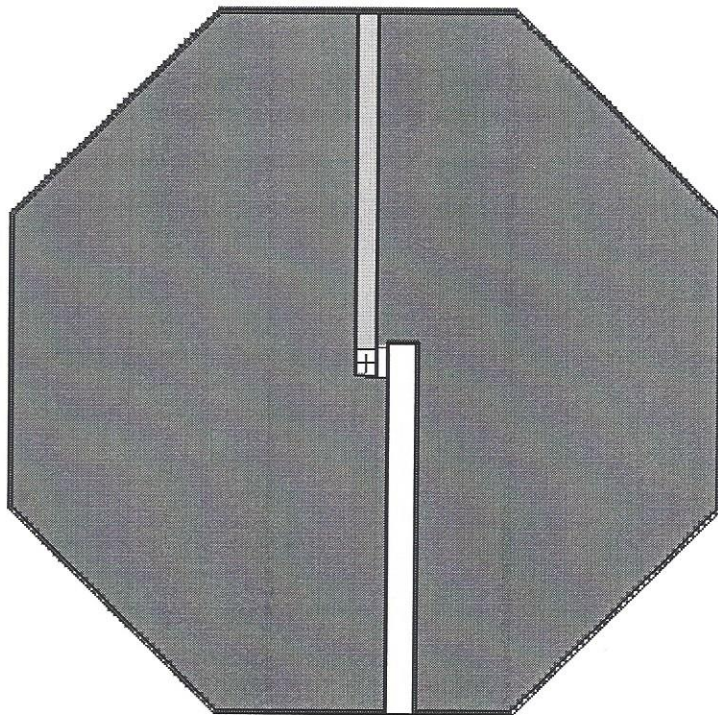
David T. Seagraves

Los Alamos National Laboratory
HSR-4 Health Physics Measurement Group
Radiation Instrumentation & Calibration Team
TA-36, Building 214
Ph: 667-4959 Fax: 665-7686

NOTE:

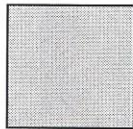
Neutron EPD Irradiator MCNPX Dose Calculations

Tally Locations



- **f5 tally**
1" off face of shield in line with source.

- **f25 tally** 2" below EPD Channel.



- **f15 tally** 1" off face of EPD magazine.

- **f35 tally** 1" below secondary shield, below EPD channel.

Source Channel (Top View)

