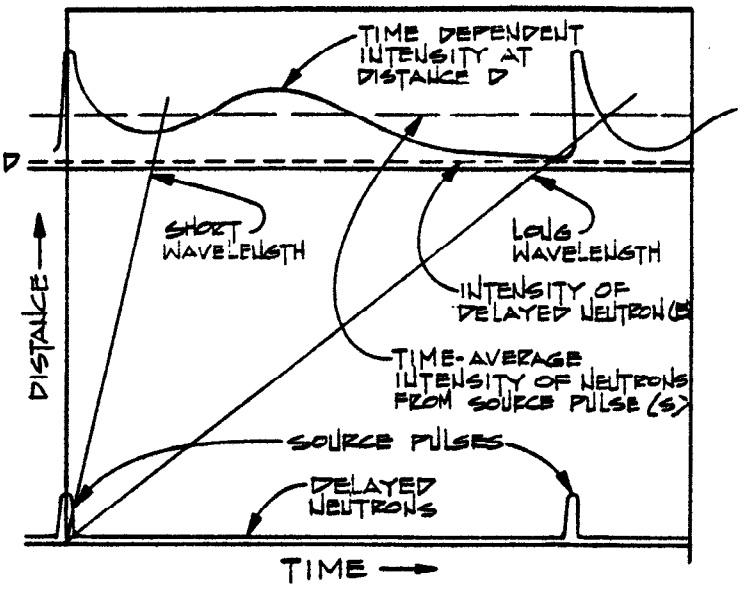

Fig. II-J.1. Illustration of how delayed neutrons produce a background in a neutron beam from a pulsed spallation neutron source.

K. Beam Port and Shutter Design at the WNR, H. Robinson, LASL

The beam ports that penetrate the WNR target 1 shield are 3.7-m long and are fabricated from carbon steel stepped pipes ranging in size from 26-cm to 59-cm diam.

When not in use, these ports are plugged with a blank beam plug consisting of 3.1 m of steel, 10 cm of polyethylene, and an outer canister of 30 cm of magnetite concrete. These ports and the target crypt are operated in a vacuum of ~ 25 microns.

The first collimator installed in the bulk shield was a drilled set of blank beam plugs with a vacuum window installed on the outside of the shield. When not in use, a 1.4-m-long brass rod is inserted into the plug. Any changes for this collimator require shutting off the proton beam.

The five remaining collimators have moving shutters or liquid filled canisters which can be drained and refilled while operating.

A typical example of the collimators used at the WNR would be the one installed on the Small Angle Scattering Experiment, Flight Path #12 (see Fig. II-K.1). The front step has a 15-cm-long collimator wheel fabricated from tungsten-boron-carbide; the collimator has six appertures ranging in size from 0.3-cm to 2.9-cm diam. This wheel is driven with an

offset mechanical shaft from the back of the plug. The remainder of this step is filled with a fixed-hole collimation. The second and third steps have a fixed hole collimation located in a rotatable shutter. The shutters are geared to a 2:1 ratio for closure from the back of the plug. The plug is fabricated from carbon steel.

The collimator plugs at the WNR have ranged in cost from $5 K to $75 K. In an attempt to reduce the cost of these units, a universal design is being considered.

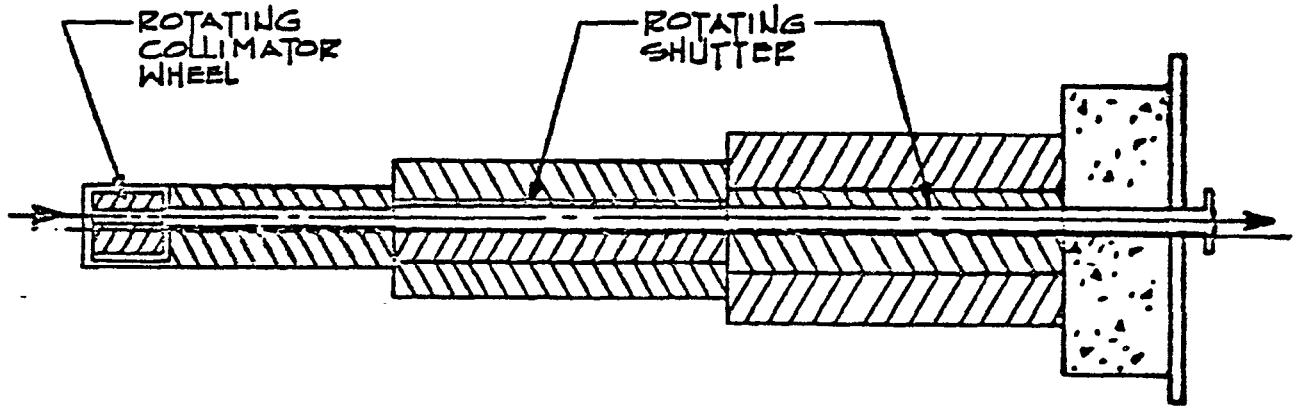

Fig. II-K.1. Flight path #12 beam plug at the WNR.

L. Neutron Radiation Detection at Pulsed Spallation Neutron Sources, R. J. Buchanan, LASL

1. Introduction

At ICANS-III, a lot has been said about new intense neutron source facilities being proposed and built around the world. I would like to address the problems of personnel radiation safety in the following areas:

- How will the neutron radiation dose rates be monitored around the source and in particular, when it is a pulsed source in the ns or μs range?
- What levels of radiation are we working with?
- How will the approximate neutron spectrum be determined over such a wide energy range (thermal to 800 MeV)?
- How will access to the flight paths and experimental areas be controlled?