were visible, down to a size of 1 cubic inch. Since the overpack which must actually be inspected is too large to scan all at once, a limited angular range would have to be used to scan it (neither the source nor the detector may penetrate the wall, so only 120 degrees of data could be taken.) This situation was simulated by restricting data to 120 and 90 degrees in some of the reconstructions. Some predictable artifacts were introduced in this mode, but the presence of voids was still indicated.

Chuck Oien (SNLL Div. 8444) also had an experiment run at SMS. His object was a pressure vessel, a few inches in diameter, with about 0.25 inch walls. He was interested in wall thickness variations of .005 inches. Scans of a phantom made of a pipe of similar dimensions with shims placed on the inner wall indicated that the required resolution could be met.

Future Efforts

We intend to get our new prototype scanner running late this year, and get some experience working with it. We would then like to upgrade to a multiple detector system--presumably at high resolution (.005 inch range). This multi-channel detector will probably be the result of a development contract, perhaps joint with LANL.

We may want to obtain a good package of simulation software. We had an RFQ out for a package, before we were aware of the SNARK77 codes. We must determine whether they will be adequate for our needs, and if not, whether to write or purchase additional software.