Letters to the Editor

Comments on the "Weinberg" Issue

It is quite fitting that *Nuclear Science and Engineering* (*NS&E*) pay tribute to Alvin Weinberg, and I am pleased that the editors and authors have done so in the August 1985 issue. It is particularly appropriate because of his warm support to the journal over the years.

Dr. Weinberg was a member of the Board of Directors of the American Nuclear Society and of its Publications Committee at the inception of *NS&E* in early 1956, and he surely contributed, together with other officials, to the likely intense discussions that established a project so important to a then young organization. For a decade during the 1960s, when the editorial office was at the Oak Ridge National Laboratory (ORNL), he was a dedicated member of the Editorial Advisory Committee providing encouragement and guidance to fledglings in that office. I am sure my predecessor would join me in these thanks for that counsel.

In a more specific vein, I also take this opportunity to add an historical footnote to Art Snell's recounting[1] of his many contributions to the Manhattan Project. He accurately and adequately tells of the early efforts at the Clinton Laboratories to provide guidance in nuclear criticality safety at the Oak Ridge Gaseous Diffusion Plant (K-25). To the credit of the segment of the Union Carbide organization then operating K-25, a predecessor of its Nuclear Division, and of its management under the late Clark Center, I add the following.

I am confident that the potential for undesired nuclear reactions within the gaseous diffusion cascade was recognized early in its design and that, within the limits of available knowledge, provision was made for their avoidance. The degree of ^{235}U enrichment was, of course, an important consideration. In 1945, there was established at K-25 a criticality safety study that included a series of experiments in early 1946 at the Los Alamos National Laboratory under the personal guidance of Louis Slotin. Those initial measurements utilized a mixture containing uranium of >90% ^{235}U, and they were repeated in Oak Ridge with 30% ^{235}U. In both cases the nuclear properties of the test material closely resembled those of UF_6. During the following several years, an extensive parametric study was made of the nuclear critical dimensions of solutions containing highly ^{235}U-enriched uranium.

Subsequently, with Union Carbide, the contractor for the three major operations in Oak Ridge, all research of this kind was consolidated within the ORNL organization. The background and experience gleaned at K-25 were a basis for an invitation to me by Dr. Weinberg in 1950 to assume the responsibilities noted by Dr. Snell on p. 363. For that invitation, I shall always be grateful.

I thank the editors for this opportunity to make a small personal contribution to the encomium.

Dixon Callihan

102 Oak Lane
Oak Ridge, Tennessee 37830

August 30, 1985

REFERENCE

1. A. H. SNELL, *Nucl. Sci. Eng.*, **90**, 358 (1985).

An Additional Comment on the "Weinberg" Issue

In the recollections of early years at Oak Ridge National Laboratory (ORNL) as described in the August 1985 issue of this journal, I regret an oversight in my description of the 1945 criticality tests of UF_6 at the 24% level of enrichment of ^{235}U. Actually, these measurements at ORNL were supplemented by probably more pertinent tests at enrichment levels of well over 90% by a collaboration between a group at the Gaseous Diffusion Plant itself and Louis Slotin at Los Alamos National Laboratory. Clifford K. Beck, A. Dixon Callihan, and Raymond L. Murray describe the first of a series of such studies in their ORGDP Special Hazards Report No. A-4716 entitled "Critical Mass Studies" and issued June 10, 1947. Thus, my implication that the ORNL work was solely responsible for the safety at the diffusion plant was an overstatement. My conjecture at present would be that knowledge of the transfer of the UF_6 criticality work to a capable group at the diffusion plant was received with relief by me; I could then forget about further work on UF_6, as I apparently did. In any event, all concerned can feel satisfaction in the absence of criticality accidents