phase under pressure was believed to be reversible and is un-
doubtedly controlled by reaction kinetics.

1.4   The Pu 1.0 wt.-% Ga alloy, therefore, even when complete-
ly homogenized, will be metastable with respect to the appli-
cation of pressure.   Because of the 0.1 to 1.5 wt.-% Ga gra-
dient resulting from coring, the degree of pressure metastab-
ility or alpha forming tendency will be greater.   A test for
proximity to an equilibrium or homogenized condition would
then be the determination of density before and after the
application of pressure.   The greater the density increase
because of alpha formation, the farther the alloy is from the
equilibrium state.   As the equilibrium or homogenized condi-
tion is approached, the density change should decrease and
level off at a constant value.

1.5   A third feature concerns the tendency to form intermetal-
lic compounds during preparation of the alloy.   For alloy com-
positions up to 3.0 wt.-% Ga the formation of Pu_xGa_y compounds
reduces the gallium available for delta stabilization.   Thus,
while the total gallium content is as specified the amount of
gallium available for stabilization may be substantially lower.
To prepare successfully the alloy using induction or resist-
ance heating facilities, it is felt that melt temperatures in
the range of 1100 - 1300°C must be achieved.   Because of the
inherently high metal temperatures achieved during arc melt-
ing, this method of alloy preparation prevents the formation
of Pu_xGa_y compounds.

1.6   In most of the compositional studies performed by other
investigators, neither of the above-mentioned methods was
used to prepare the alloy.   Therefore it was decided to re-
determine the compositional effects on several properties us-
ing properly prepared alloys.   In addition, it was decided to
study the phenomenon of pressure metastability in both cored
and homogenized alloys.

2   Experimental Procedure

2.1   Experimental Material

2.1.1   The plutonium-gallium alloys used in this work were