on re-entry and become molecular particles which would be distributed harmlessly and in very small quantities in the biosphere. The first safety concept on Nimbus was that the microspheres would be dispersed on re-entry as the capsule burned up and would fall to earth as BB-like particles 50 to 150 microns in diameter—too large to be inhaled by living organisms. Tests at Ames, however, showed that the microspheres broke into sizes that could be inhaled. The second change on Nimbus was the adoption of the "intact re-entry/break open on impact" concept, in which a graphite block that contained the capsule which held the plutonium survived re-entry, with the capsule and plutonium becoming a frozen pudding during re-entry; upon impact with average soils of the Earth, the graphite block would break open, permitting the pudding inside to disperse in a small crater formed by the impact.[20] The third change was the adoption of an "intact re-entry/intact on impact" concept, in which the capsule was made of refractory materials which did not melt during re-entry; the intact capsule, containing the plutonium, was retrieved as a whole unit after impact on Earth.

Paul Dick at Martin-Nuclear (now Teledyne) remembered the "crash" effort required by this change in safety concept. "One morning we were called to Germantown by Bob Carpenter and told our safety concept on Nimbus wasn't working. We had six months to develop an intact re-entry source." Guy Linkous of Martin-Nuclear recalled that this project absorbed most of their people for a while. Dick noted with pride: "We did that job successfully, although I think no one believed we could do it. ...I doubt if we could accomplish that kind of turnaround in six months today. There are more requirements imposed by more organizations today."[21]

Development activities for the intact re-entry heat source were initiated in March 1967.[22] Late in the year, INSRP recommended approval of the launch, after having evaluated various types of risks associated with different phases of the total mission. This did not eliminate dissent, particularly from Harold Price, AEC's Director of Regulation, who went on record with the following position:

> ...the risk of exposure of people from failure of the SNAP-19/NIMBUS-B mission appears to be greater than that associated with the design basis accidents for nuclear reactors. For this reason, we are unable to concur in the recommended launch of the mission. On the