Interesting Issues in Reactor Design for Medical Isotope Production

Tuesday, February 9, 2016 • 3:30 – 4:30 p.m.
Geddes Hall Auditorium
Reception prior to seminar at 3:00 - 3:30pm
in the Dooley Room, LaFortune

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Aqueous reactors using solutions of uranium salts can provide a new supply chain to fill potential shortfalls in the availability of the most common radiopharmaceuticals currently in use worldwide, Technicium-99, which is a decay product of Molybdenum-99 (99Mo). In a fissioning aqueous solution, the power generated from fission determines the absolute yield of daughter isotopes produced, including 99Mo. The fissioning of the uranium in these solutions creates 99Mo but also generates hydrogen and oxygen gases from the radiolysis of the water. When the dissolved gases reach a critical concentration, bubbles will form in the solution. Bubbles in the solution affect both the fission power and the heat transfer out of the solution. As a result, the effects of the bubbles on heat transfer must be understood for reliable performance and safe operation. This will be the focus of the talk and how it affects the overall engineering design.

Michael L. Corradini is a Professor of Nuclear Engineering and Engineering Physics at the University of Wisconsin-Madison. He served from 1995 to 2001 as Associate Dean for the College of Engineering and as Chair of Engineering Physics from 2001-2011. He has published widely in areas related to transport phenomena in multiphase systems. In 1998, he was elected to the National Academy of Engineering. He served as a presidential appointee in 2002 and 2003 as the chairman of the Nuclear Waste Technical Review Board. From 2004-2008, he served as a board member of the INPO National Accreditation Board for Nuclear Training. In 2006, he was appointed to the NRC Advisory Committee on Reactor Safeguards and was elected to the National Council on Radiation Protection and. Most recently, he was appointed Chair of the Scientific Advisory Committee to the French Atomic Energy Agency. He began and now serves as the Director of the Wisconsin Energy Institute. He was elected as the President of the American Nuclear Society for 2012 – 2013.