



Contribution ID: 59

Type: Oral

Economics of Radiation Processing Technology: Posers and Prospects

Friday, 28 April 2017 11:15 (20 minutes)

Radiation processing of materials for a variety of applications has been well-established, and is also continuing to evolve further. The cost of radiation treatment, that is, say, dollar per kGy per kg, is dependent on several factors of the radiation facility and operations, and almost always irrespective of the nature of material being treated. Consequently, materials of higher value like medical disposables, most spices, etc. have been more favourable for radiation treatment from the point of view of economics. Furthermore, certain minimum overhead cost is invariably present in all cases, and thus low-dose requirement for certain commodity may not necessarily mean lower cost for radiation treatment. The absorbed radiation dose required is known to vary (Gy to kGy) over a few orders of magnitude, and a single radiation facility to cater to the entire range is a known challenge. There are technology options but they come with added complexities. The scope for year-round availability of the same material, or a group of materials, requiring radiation processing is another key issue to be addressed. Yet another dimension of technology has been the availability of a choice between gamma radiation plant and electron accelerator (EB machine) facility, each with its own strengths and issues. The ease and ruggedness of operation of Cobalt-60 based plants and their modest infrastructural needs are appreciable and proven records are available. However, the availability and transportation of sources for replenishment, and mostly fixed-dose delivery feature of gamma facility pose certain limitations. EB systems, especially of variable energy and power, would prove advantageous, while the ease and ruggedness of their routine functioning over sustained, long-periods has very limited record, leave alone the need for assured availability of high-quality power supply (issue in many countries). Mostly two major areas of use are contemplated by the stakeholders, namely, sterilisation or hygienisation of products on one hand, and tackling and treating pollutants, on the other hand. Safe and often prolonged preservation is the need in the former case and for cost consideration. The risk and cost to society and environment by not-treating the harmful pollutants in managing them are the drivers in the latter case. Placing a simple dollar figure here may not be necessarily feasible or easy. Naturally, for policy makers and end-user stakeholders, the above scenario presents an equivocal picture, of an attractive technology available for value-addition, but with techno-economic challenges. The author has had experience in dealing with stakeholder experts from IAEA Member States, and earlier in India with different industries seeking to use radiation processing. Invariably, objective, frank analysis of every specific case has been necessary and useful to better understand and/or explain the various aspects and factors to be addressed. It is imperative for technology experts to speak in single unequivocal language to the national policy makers and end-user stakeholders, so that the considerable merits of radiation processing are well harnessed to meet every specific national need and priority.

Country/Organization invited to participate

India

Primary author: Mr RAMAMOORTHY, Natesan (Retiree from IAEA, Vienna and BARC, DAE, Mumbai, In-

dia)

Presenter: Mr RAMAMOORTHY, Natesan (Retiree from IAEA, Vienna and BARC, DAE, Mumbai, India)

Session Classification: A15

Track Classification: IRRADIATION FACILITIES