



Non Destructive Evaluation of Ceramic Radome

C. Muralidhar, K. Kumaran and G.V. Siva Rao

Non Destructive Evaluation Division, Directorate of Engineering
DMRL Kanchanbagh, Hyderabad 500 058.

Abstract

The ceramic radome is made by slip cast method using silica. It is a variable thickness radome. Non Destructive Evaluation (NDE) of radome has been carried out by Ultrasonic (Pulse Echo Testing), Radiography and Computed Tomography.

The couplant used (oil & Epoxy resin) for Ultrasonic (PET) seeps through the radome and cause inconvenience for the testing and hinder with its electromagnetic performance.

Film Radiography was employed to find out the defects in the radome and some normal shots were taken. Radiographs revealed no defects.

Computed Tomography (CT) was carried out using medical CT system. CT generates cross-sectional images of the object. Initially, Digital Radiography of the radome was taken and selected the slices and cross-sectional images were taken. The contrast in the tomograms was measured by linear attenuation coefficients in Hounsfield values (HU). The density profile along a line on the cross-sectional image of the radome was taken to differentiate the defects such as pores, cracks and inclusions (high and low dense). 2-D images were stacked one over the other and the 3D image is generated to see the extent of defects. These features are not available in Radiography. These features enhance the defect detection capability. However, tomograms of the radome revealed no defects. Contrast and Resolution phantoms were scanned to check the CT system performance parameters.

Finally the advantages and limitations of the above NDE techniques in assessing the radome have been discussed.