



# AEC-NASA TECH BRIEF

## *Space Nuclear Systems Office*



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### Locating Tube Blockage That X-Ray Cannot Detect

A document explaining the available alternate choices to the use of X-rays in detecting foreign materials in metal assemblies has been compiled. The use of X-rays is a standard technique in the field of nondestructive testing. Other methods include the use of penetrants, magnetic particles or eddy-currents. However, because of penetration limits, none of these techniques is satisfactory when a piece of low-density material such as plastic, cloth, wood or rubber is trapped in tubing which is buried in thick metal. Such occurrences are frequent and can be serious.

The document describes the results of a study in which other known methods were compared with X-rays and then examined for usefulness and reliability. These methods include negative radiography, neutron radiography, liquid-crystal inspection and ultrasonics. A lucid description is given regarding the features, advantages and disadvantages of each method. Photographic plates display the comparative detection capabilities in each case. The document concludes with a recommended "formula" which permits the reader to make a choice of the best method for his purposes.

Titled "Locating Tube Blockage That X-Ray Cannot Detect," the report should be of value in many testing and inspection situations, including heat exchangers, piping systems, and mechanical configurations.

#### Note:

Requests for further information may be directed to:

Technology Utilization Officer  
AEC-NASA Space Nuclear Systems Office  
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