

C217100 : MAJOR NUCLEAR TECHNOLOGY

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KITSOM PHUNKOSOL : INSPECTION OF SOME AIRCRAFT COMPONENTS USING
NEUTRON RADIOGRAPHIC TECHNIQUES. THESIS ADVISOR : ASST. PROF. NARES
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In this research, neutron radiography was tested for nondestructive inspection of some aircraft components such as a honeycomb material, a fibre-glass sheet, parts of a jet engine and an automatic parachute ejection system in comparison with x-ray radiography. Two neutron radiographic systems were used i.e. a Kaman A-711 neutron generator system and a 5-Ci Pu-238/Be isotopic neutron source system. The neutron collimators were designed and constructed for this purpose. It was found that, in the first system, the neutron radiographs were interfered by x-rays and gamma-rays produced from the neutron tube-head and the neutron interactions respectively. Shielding against x-rays and gamma-rays needed to be improved. Unfortunately, the neutron generator had been out of order before the improvement in shielding finished. For the Pu-238/Be system, the neutron radiographic images had better image sharpness and contrast but the exposure times were found to be very long. With the NE426 screen/ASA400 film combination, the exposure times were found to be about 10 minutes and 20 hours for the neutron generator operating at 160 kV, 1.5 mA and the isotopic source respectively. However, the results indicated the advantages in utilizing neutron radiography for inspecting specimens containing light elements such as plastic, rubber, fibreglass and explosives.