

# **A study of neutron backscattering technique application to detect accumulated liquid under polyisocyanurate (PIR) thermal Insulation.**

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This paper presents a study of neutron backscattering technique to determine the liquid accumulated under the polyisocyanurate (PIR) thermal insulation in gas separation plant transmission pipe line. The accumulated liquid could be from condensate at the surface of pipes or leakage at insulation cladding that allows external liquid source to penetrate into the vicinity of thermal insulator. This accumulated liquid can induce the corrosion at the pipe's surface in long term consideration. Neutron backscattering technique is one of challenge technology since it senses to the hydrogen-rich medium, moderated and finally backscattered to the detector. The specimen used in this study made up of 254 mm pipe covered by PIR insulation. The accumulated liquid could be adjusted through 5 layers in the experimental slot to control the location and amount of liquid to be detected. The results showed the consistency between the amount of accumulated liquid and neutron backscattered count rate i.e. the greater amount of liquid, the greater count rate is. The location of accumulated liquid plays significant role, it is easier to indicate the location of accumulated liquid when it is closed to the neutron probe than closed to the pipe surface. This studying result can be used to identify the location where the corrosion could highly be initiated under the insulation.