1. Introduction

Research reactor development, ~~is a very powerful tool due to its wide contribution in many endeavors. More importantly, it is~~ considered to be an essential element for advancing research, ~~development~~contributes powerfully to the ~~and~~ improvement of many fields such as the nuclear industry ~~as well as other related fields~~ [1]. ~~Research reactor~~They ~~can be used for many purposes such as~~can help ~~train~~ing, educat~~eion~~, aid in isotope production, and allow the testing ~~the~~ of the behavior of materials [1]. However, a research reactor's primary function is the ~~The main goal of using the research reactor is to~~ pro~~duction of~~duce neutrons which are often used within the fields of ~~which are beneficial for a wide range of applications in area such as~~ medicine, agriculture, and manufactory [1]. ~~Thermal research reactors produce thermal (low energy) and epithermal neutrons (intermediate energy) which are useful for Neutrons with low and intermediate energy levels (thermal and epithermal neutrons respectively) are sufficiently produced in thermal research reactors and can be used for a wide range of purposes. This includes~~ basic irradiation experiments, neutron radiography, radiolysis, neutron activation analysis (NAA), low-scale isotope production, etc. ~~In~~ contrast, hard spectra are required, for example, in cases where fast neutron damage is being investigated or high energy neutron dose is important. Experiments, such as advance test of material behavior or large-scale isotope production, can benefit from the appropriate combination of flux magnitude and energy spectrum. Research reactors are not without challenges; for example~~One of the challenges in research reactors is~~ research reactors are not efficient with fast neutron~~the~~ sustenance of fast neutron in a highly moderating environment [1,2]. To overcome these challenges, some research reactors are specifically ~~Thus, some research reactors are specifically~~ designed for fast spectrums;, for example, there are~~,~~ fast flux test facilities~~y~~ (FFTF), high flux isotope reactors (HFIR) and advance test reactors (ATR) [3-6]. These types of research