

Material challenges for nuclear systems by todd allen

[Engineering](#)



**ASSIGN
BUSTER**

The paper “ Material Challenges for Nuclear Systems by Todd Allen” is an excellent example of an article review on engineering and construction. This article gives an analysis of the reliance on fuel success and construction materials for the economical and safe operation of nuclear power systems. In the lifetime of a nuclear power system that is more than sixty years currently, the construction materials are subjected to a corrosive environment, high temperatures and damage from high energy pieces resultant from fission. Subject to the same extreme environments, the fuel that offers power to the reactor is said to have less life span (Allen et al. 23). This article will generally look at the fuel environment and materials from proposed and current nuclear systems and how they work. A description is given of the creation of an advanced test reactor scientific user facility that allows United States users to test some of their ideas on improving materials and fuel.

Due to the extreme temperatures of the nuclear reactor, the following examples are given of materials to be used in the construction. Most power plants have replaced the alloy 600 with the alloy 690 in the steam generator which is more resistant to corrosive cracking. Also in the base materials, there are weld joints (Allen et al. 27). There is also a need to make changes in the embedded reinforcement of steel. Another case is the need to change the materials of construction in the reactors. The new design of the reactors would involve the inner structures ability to tolerate high sodium levels. The composition of the materials to be used in the construction of the water reactor fuel rod is interesting. The materials include the expansion spring spacer, an end cap and a fuel pellet inside the cladding.

With this material combination then the alterations to be done on the nuclear power systems will lead to economical and safe operation of nuclear power systems.