

Стандартная сложность, «АТОМ»

REACTOR FUEL ASSEMBLIES

Both boiling water reactor and pressurized water reactor fuel assemblies consist of the same major components. These major components are the fuel rods, the spacer grids, and the upper and lower end fittings. The fuel assembly drawing shows these major components (pressurized water reactor fuel assembly). The fuel rods contain the ceramic fuel pellets.

The fuel rods are approximately 12 feet long and contain a space at the top for the collection of any gases that are produced by the fission process. These rods are arranged in a square matrix ranging from 17 x 17 for pressurized water reactors to 8 x 8 for boiling water reactors. The spacer grids separate the individual rods with pieces of sprung metal. This provides the rigidity of the assemblies and allows the coolant to flow freely up through the assemblies and around the fuel rods. Some spacer grids may have flow mixing vanes that are used to promote mixing of the coolant as it flows around and through the fuel assembly.

The upper and lower end fittings serve as the upper and lower structural elements of the assemblies. The lower fitting (or bottom nozzle) will direct the coolant flow to the assembly through several small holes machined into the fitting. There are also holes drilled in the upper fitting to allow the coolant flow to exit the fuel assembly. The upper end fitting will also have a connecting point for the refueling equipment to attach for the moving of the fuel with a crane. For pressurized water reactor fuel, there will also be guide tubes in which the control rods travel. The guide tubes will be welded to the spacer grids and attached to the upper and lower end fittings. The guide tubes provide a channel for the movement of the control rods and provide for support of the rods. The upper end of the control rod will be attached to a drive shaft, which will be used to position the rod during operation.