

Nuclear energy is an important energy source of the world. Nowadays, over 400 nuclear reactors in more than 50 countries provide about 10% of the world's electricity. I will focus on the cooling towers that are usually found close to the nuclear plants. Cooling towers are essential facilities of nuclear plants for removing large amount of heat and energy in the nuclear reactions and releasing them into the atmosphere in form of water stream. I attempt to illustrate the applications of mathematics by revealing the uses of hyperboloid and hyperbola in my infographic work beyond the equations and formulas.

Cooling towers are built with hyperboloid shapes which can be formed by rotating a hyperbola about its axis and a hyperbola is an open curve with two branches that is formed from the intersection of a plane with both halves of a double cone. Mathematically, hyperbola can be regarded as the locus of a moving point whose difference in distances between two fixed points (called foci) is a fixed constant.

The advantages of the hyperboloid shape of cooling tower includes but not limited to reducing resource consumption and the environmental impact during the nuclear power production. Not only does the curved shape of hyperbola of the hyperboloid provides a strong and powerful structure, but it also has many practical functions. The broad base of the tower facilitates evaporation due to its relatively greater area. The narrow middle part can speed up the air flow and thus improves the cooling efficiency. The tower is widening from the middle to the top in shape to allow mixing of the moisture laden air into the atmosphere.