

Heat Transfer Performance Test of the KN-12 Transport Cask

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Abstract

Two heat transfer tests were performed as a fabrication performance test to demonstrate the heat transfer capability of the KN-12 spent nuclear fuel transport cask. The tests were conducted under normal conditions of transport with a total heat load of 12.6kW to simulate the design heat load of the cask. The heat load was best represented by twelve electrical dummy heaters, which were designed to simulate actual configurations and conditions of twelve PWR spent nuclear fuel assemblies. The test determined steady state temperatures on the outer surfaces of the cask and impact limiters and within the fuel basket. The steady state temperatures were compared to the calculated temperatures to determine the accuracy of the design calculations. The intention of this paper is to evaluate test results which were measured during the heat transfer test for the KN-12 cask. The evaluation was done using maximum values for different cask components which were calculated for the Safety Analysis Report of the KN-12 transport cask. The test temperatures were described very well by the calculated maximum component temperatures and the calculated component temperatures were higher and therefore conservative.