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"Development of FAA Copper Tube Heat Flux Calorimeter for Parametric Study of Heat Flux Calibration"

FAA certification fire test guidance for oil burners includes requirements for both flame temperature and heat flux calibration to ensure that the resulting flame is qualified to simulate the severe fire conditions that can occur on aircraft or in a powerplant environment. Burner heat flux calibration is a regular issue of concern among transportation authorities. This work includes the development of the FAA copper tube heat flux calorimeter ("BTU heat transfer device") as per the FAA design described in the FAA Powerplant Engineering Report no. 3A and in Section 11.3.3.2 of the FAA Fire Test Handbook. A sensitivity study will show the effect of undefined design parameters of the calorimeter on the heat flux measured, using both a Carlin type modified gun burner and the latest version of the FAA NexGen Burner. Once a final configuration of the copper tube calorimeter is selected, the heat flux density will be measured using a Gardon gauge, for comparison. In addition, The work includes a comparative evaluation of the burner characteristics for both burners in accordance with report FAA-RD-76-213.