KIRAN KUMAR K U

Phone: 91-9880190497 kiraniitm1988@gmail.com

OBJECTIVE

- To utilize and enhance my existing knowledge and to learn new skills to fulfill organization's objectives as well as to achieve the personal goals.

EDUCATION

Program	Institution	% (or) CGPA	Duration
M.Tech - Thermal Engineering, Department of Mechanical Engineering	Indian Institute of Technology Madras (IITM)	7.38	2010-2012
B.E - Mechanical Engineering	B.M.S. College of Engineering, Bangalore	68.7	2006-2010
Intermediate(Maths, Physics, Chemistry)	Vijaya PU College, Bangalore	71.8	2004-2006
S.S.L.C	ST .Joseph's Indian High School, Bangalore	77.2	2001-2004

WORK EXPERIENCE

Pearson Education Services, Koramangala, Bangalore. July-2013 – Dec-2013

- Designation: SME (Subject Matter Expert) – Mechanical Engineering.
- Role: Content Development for Interactive Tutor, Story Board, Pen tab objects and Simulation Tools.

Purple Frame Technologies, Electronic city, Bangalore. Dec-2013 – July-2014

- Designation: SME (Subject Matter Expert) – Mechanical Engineering.
- Role: Story Board, Interactive Tutor .

Dayanada Sagar College of Engineering, Kumaraswamy Layout, Bangalore. Aug-2014 – July-2015

- Designation: Assistant Professor.

ACADEMIC ACHIEVEMENTS

- Secured All India Rank: 357 in Mechanical Engineering, GATE-2010.
- Handled multiple projects with research Scholars in Thermodynamics and Combustion Engines Laboratory, IIT Madras (2011-2012).
- Interpersonal Skills and Working in Teams.

TECHNICAL EXPOSURE

- Designing Software's: HTML-5, Solid Edge, Solid Works, Fanuc.
- Fluent, FDS (Fire Dynamic Simulator Version 5).

PROJECTS

B.E Project: Thermal Conductivity measurements of different metal rods, Under the guidance of Mr.R.Mahendran.

Objective: Design of experimental set up to measure Thermal Conductivity "K" for different material under different temperature conditions.

Conclusion

The obtained experimental thermal conductivity values of copper, aluminium and stainless steel are in close approximation with their standard values so this type of setup can be used to measure the thermal conductivity of various metals.

M.Tech Project: Numerical prediction of ventilated compartment fire transients for an ISO-9705 room configuration, Under the guidance of Dr. V. Raghavan, Thermodynamics and Combustion Engines Laboratory, IIT Madras.

Objectives: (a) To study the consequences of hydrocarbon pool fires within a compartment using Fire Dynamic Simulator software (FDS v.5.0).

(b) Conducting parametric study with respect to fuel type, quantity, ventilation size and opening, compartmentation.

(c) Based on above study generate information for design of ISO-9705 room compartment.

Compartment Fires

A compartment is a confined space in which air supply and thermal environment of the fire are subjected to few constraints, unlike in a free fire in an open space. These factors control the spread and growth of the fire, its maximum burning rate and its duration. Compartment fires generally refer to fires in a simple room configuration.

About FDS

FDS is developed, maintained and updated by National Institute of Standards and Technology (NIST), USA. FDS can be used to model the following phenomena: Low speed transport of heat and combustion products from fire Solid and liquid pyrolysis, Flame spread and fire growth, Sprinkler, heat detector and smoke detector activation, Sprinkler sprays and suppression by water.

Model Features

FDS can be broken up into several major sub-models:

Hydrodynamic Model FDS solves numerically a form of the Navier-Stokes equations appropriate for low speed and thermally driven flow with an emphasis on smoke and heat transport from fires. The core algorithm is an explicit predictor-corrector scheme, second order accurate in space and time. Turbulence is treated by Large Eddy Simulation (LES).Direct Numerical Simulation (DNS) is performed for underlying fine numerical grid .LES is the default mode of operation.

Combustion Model FDS uses mixture fraction combustion model. The mixture fraction is a conserved scalar quantity defined as the fraction of gas at a given point in the flow field that originated as fuel. In its simplest form, the model assumes that combustion is mixing controlled and that the reaction of fuel and oxygen is infinitely fast regardless of temperature. For large scale well ventilated fires this is a good assumption. The mixture fraction combustion model is adopted in the present fire models as the actual chemical processes that control the combustion energy release are too complicated to be fully understood. This simplified combustion model assumes that combustion is mixing-controlled

Multiple Meshes This term is used to describe the use of more than one rectangular mesh in a calculation. It is possible to prescribe more than one rectangular mesh to handle cases where the computational domain is not easily embedded within a single mesh.

Boundary Conditions All solid surfaces are assigned thermal boundary conditions as well as information about the burning behavior of the material. Material properties are stored in a database and invoked via name by the user. Material properties included in the model database have been compiled from literature sources. In many cases the necessary material properties are not contained within the model database and therefore they must be derived from experiments or obtained from other sources for use with the model.

Compartment Fire Test Facility (CFTF)

A Compartment Fire Test Facility (CFTF) was used to conduct experimental studies on hydrocarbon (oil/combustible solvent) pool fires. The main components of CFTF are the fire compartment, free burn fuel pan, exhaust hood and an exhaust duct with a smoke extraction fan. The numerical simulation was conducted using ISO-9705 room configuration. The fire compartment along with its support structure will be located inside a main building / hall of size: 15 m × 6 m × 6 m. Fuels/solvents such as kerosene, ethanol and n-dodecane will be used as the primary combustible material for the experiments. The facility will be provided with extensive instrumentation for measuring various fire related parameters.

Results and discussions

Heat Release Rate (HRR) Fire development within the enclosure is generally characterized in terms of variation of heat release rate (HRR) with time. The fire development can be mainly divided into three stages namely, Growth Phase, Steady Burning Phase and Decay. The steady burning phase continuous for a much longer duration compared to the growth and decay phase. The smallest fuel pan releases lowest amount of heat and biggest tray releases the highest amount of heat at any instant of time. In all the cases, the incubation period is quite small between 5 and 10 s only.

Hot Gas Temperature Combustion of the fuel in well-ventilated compartments result in two stratified layers within the compartment called hot layer and cold layer. The upper layer is occupied by hot combustion gases, whereas the lower layer is relatively cold due to the entry of cold air from the door.

Floor Heat Flux The floor heat flux is positive at the Growth Phase and Steady Burning Phase i.e., the compartment heat boundary receives the hot gases during the steady burning phase. Thereafter at the end of decay phase the heat flux is negative i.e., the hot gases receives from the hot boundary compartment.

Compartment Pressure The pressure within the compartment due to combustion gases remains uniform in the hot and cold layers.

Conclusions

In this work, comparison has been made between three models for the various compartment fire configurations consideration including varying Exhaust hood position, fuel pan size, multi- compartmentation and ventilation system. A parametric study for various fuel loads and fuel types (ethanol and kerosene) has been carried out using numerical simulations and following conclusions are drawn:

1. A heat release rate transient curve clearly showed that heat release rate is steady for longer duration in case of small size pan compared to large pan size. The HRR for ethanol remained steady for longer duration compared to kerosene. The HRR was found maximum in case of kerosene (942 kW) with larger fuel pan size. The mass loss rate transient was found to follow the HRR curve in all the cases.

2. The total Heat fluxes was measured at the floor and wall of the fire compartment. The floor and wall heat fluxes in all the cases were found to be positive during steady burning phase and at the decay period the heat flux was negative as the wall heat was transmitted to the exhaust gases in the compartment. The peak net heat flux was found in case of kerosene with larger floor area.

3. The compartment pressure transients were obtained at the hot and cold layer of the compartment and were found to be uniform for both the layers. A peak pressure of 11N/m² was obtained in case of kerosene with larger floor area.

From this study, a conclusion has been made that there are numerous parameters and many different ways in which fire development could occur in a room, it is essential that while to specify a design fire, factors such as fuel type, quantity and ventilation system has to be given more attention. The requirements of the fire mitigation system can then be arrived at correctly and economically.

CO-CURRICULAR ACTIVITIES.

- Obtained C grade Certificate from NCC (National Cadet Corps).
- Selected for SAI (sports Authority of India) in swimming (2003).

STRENGTHS

- Hard Working
- Confident

EXTRA-CURRICULAR ACTIVITIES

- Basketball
- Swimming
- Carroms
- Cricket

PERSONAL DETAILS

Gender : Male

Date of birth : 8th March 1988

Languages Known : English, Kannada , Marathi and Hindi.

Nationality : Indian

Father's Name : Umashankar K.N

Mother's Name : Leelavathi.K

Permanent Address : S/o Umashankar K N, No.20, 1st cross, 1st main, CKC Garden Bangalore-560027

DECLARATION

I do hereby declare that all the information given above is true to the best of my knowledge.

Kiran Kumar K U