

Introduction to Fire Dynamics Simulation

Course Description:

This is a two day course intended for engineers who have basic knowledge in computational fluid dynamics (CFD) and want to pick up skills on performance simulations. Fire Dynamics Simulator (FDS) 6.1.2 is a mathematical tool for solving fire-driven flow. Similar to CFD, it solves Navier-Stokes equations, but using large eddy simulation which is appropriate for low-speed, thermally-driven flow.

Fire Safety is of utmost importance to all occupants of any buildings. From fire simulation to evacuation simulation, performance-based approach relies on fire engineering principle, as well as software modeling to achieve safe and efficient designs. The industry is going from prescriptive to a performance-based approach. It provides greater flexibility for the building designers to come up with more complicated designs, without compromising the desired level of fire safety. It is also an engineered approach that tackles project specific issues and threats as compared to generic code provision.

Event Detail:

- Date: 03 Mar 2015 - 06 Mar 2015 (SGP)
- Time: 9am - 6pm
- Venue: TBC (SCDF Campus)

Who Should Attend:

- Fire Safety Engineer
- M & E Engineer

Jointly Conducted by:

- BSD
- Thunderhead Engineering Consultants, Inc.

CPD/SCDF Points (Pending)

CPD (For Registered Engineers): Beginner - 14 points, Advanced - 14 points

SCDF (For Fire Safety Engineers): Beginner - 14 points, Advanced - 14 points

Total Maximum points: (3 x 7 Hours/day) + 6 = 27 points

Participants are to bring along laptop computers to participate in the hands-on sessions. Laptop computer running XP Service Pack 3 or higher will be required.

Free 30-day trial licenses for PyroSim provided to all attendees.

Registration Cost:

- Beginner Course: \$900
- Advanced Course: \$900
- Full Course: \$1,800

Registration Procedures:

Interested participants are required to complete the following registration forms and return it with your cheque payment in favour of "Building System & Diagnostics"; marked Account payee only to the above address.

WORKSHOP 1: INTRODUCTION TO FDS

Duration: 2 x 7 hours/day = 14 hours (excluding lunch and coffee breaks)

Cost: SGD 900

Venue: SCDF HQ

DAY 1

Introduction to FDS Workshop Day 1 (3 rd March 2015)	
Time	Topic
0830 – 0900	Registration
0900 – 1000	Introduction to FDS 6.1.2 and Smokeview - Quick Demo of FDS 6.1.2 - What is FDS 6.1.2 good for and not so good for Hardware and Software Requirements
1000 – 1030	Coffee Break
1030 – 1200	Elements of Constructing a Scenario <ul style="list-style-type: none"> • The Domain • The Mesh • Influence of Mesh Cell Size • Openings and Zones • Ventilation and HVAC • The Fire • Obstructions • Building Structures in a Model, PyroSim & CAD Import
1200 – 1300	Lunch and Networking
1300 – 1430	Hands-on Session: Construction of a Simple Scenario Running FDS 6.1.2
1430 – 1530	Introduction to Smokeview (Viewing the results in Smokeview) - Data Collection - Gas Phase Reactions - Solid Phase Reactions (Materials and Surfaces)
1530 – 1600	Coffee Break
1600 – 1730	Demonstration on using Smokeview for different case studies https://www.youtube.com/watch?v=Wsa4ml0rO-o
1730 – 1800	Review of Day 1 session. Q & A
1800	End of Day 1

DAY 2

Introduction to FDS Workshop Day 2 (4th March 2015)	
Time	Topic
0900 – 1100	Modeling Basics - Review of Fire Modeling Principles: Zone & Field models - Modeling Practicalities
1100 – 1130	Coffee Break
1130 – 1300	Modeling Basics - Rectangulation of compartments - Describing modeling compartments - Practical session
1300 – 1400	Lunch and Networking
1400 – 1530	Results - Assessing and evaluating results - Validating of results - Sensitivity Studies and Quality Metrics - Extracting usable information - Performance-based design
1530 – 1600	Coffee Break
1600 – 1730	Case Studies and Tools for FDS 6.1.2 - PyroSim - Forensic Reconstruction examples using FDS 6.1.2 - Multiprocessing - Strengths and Weaknesses - Resources - Comparison study using FDS 6.1.2 and PyroSim
1730 – 1800	Review of Day 2 session. Q & A
1800	End of Day 2

Presenter

Bryan Klein
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Mr. Bryan Klein is currently the Product Manager for PyroSim and Pathfinder at Thunderhead Engineering Consultants, Inc. He handles sales and support issues, along with training both online and on-site.

Mr Klein formerly worked as part of the Fire Fighting Technology Group in the Engineering Laboratory at the National Institute of Standards and Technology (NIST), where he provided assistance in many areas of research and development. One of the primary duties of the Fire Modeling Group was to establish modern best practices for FDS and Smokeview (SMV) code development, distribution, archiving and bug reporting. As the FDS and Smokeview Community Manager, he assembled a cohesive collaboration and communication platform to improve developer and support communication between the core development team and users of the FDS-SMV software package. In addition, as a part of the simulation and reconstruction of actual fire incidents process, he specialized in acquiring and generating geometry, materials and ignition properties, creating input for fire models and conducting parametric studies of ignition location, ventilation and material flammability for specific scenarios.

<http://www.nist.gov/publication-portal.cfm?authorid=861119>

Prior to working at NIST, Mr. Klein was employed at Western Fire Center, Inc. in Kelso, WA for approximately 5 years where he performed many of the same duties as he would eventually perform at NIST, along with expert witness and litigation support activities and Laboratory Quality Assurance Management.

Mr. Klein also served in the United States Air Force and holds a BS degree in Information Technology.