Computer Models For Fire and Smoke

Model Name:	EGRESS
Version:	5.4
Classification:	Evacuation simulation model
Very Short Description:	Versatile model for predicting the evacuation of crowds which may be used in a large variety of situations
Modeler(s), Organization(s):	Neil Ketchell, AEA Technology, UK
User's Guide:	AEA EGRESS User Manual, August 1993
Technical References:	Modeling of crowd evacuation: guidance on the method, AEA/CS/16405219/5/A, August 1995
	"The EGRESS code for human movement and behaviour in emergency evacuations", Ketchell, N., Cole, S., Webber, D. M., Marriott, C. A., Stephens, P. J., Brearley, I. R. Fraser, J., Doheny, J., Smart, J., Engineering for crowd safety, Institution of Civil Engineers, London, 17-18 March 1993.
Validation References:	"When and how will people muster? A simulation approach (Description and validation of the EGRESS code)". Ketchell N, Hiorns N, Webber D M, Marriott C A, Presented at "Response to incidents offshore", Aberdeen, June 1993. OR "Assessment and simulation of crowd evacuation issues", Ketchell N, Webber D M, Cole S K, Stephens P J, Hiorns N, In "Fire Engineering and Emergency Planning - Research and Applications", Ed R Barham, E & FN Spon, 1996. Presented at Eurofire '95, Nimes, France, 25-27 March 1995.
Availability:	EGRESS analysis is available on a consultancy basis. The software is not currently offered for sale.
Price:	Prices depend on the assessments required.

Necessary Hardware: IBM compatible PC running windows 3.1 or higher

Computer Language: C++

Size: About 1MB for code and typical files, 4MB of RAM.

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Detailed Description:

EGRESS makes use of a user defined plot plan of the structure being evacuated and models the movement of people, as individuals, around it. A simple example is shown.

In EGRESS "people" are modeled as individuals on a grid. The simulation technique used is based on the use of cellular automata. At each "time-step" the "people" move from cell to cell based on the throw of a weighed die. The weights required for the die are calibrated against information on speed, or flow, as a function of density, so that the experimental data can be adequately represented where it is valid. EGRESS has been validated against a range of available evacuation trials by simply drawing up the

configurations and using all the default parameters. The agreement between the code and measured evacuation times was of order ±20%, except where specific features (eg. an aircraft over-wing exit) were not included in the default modeling. EGRESS 5.4 has a wide range of facilities available to account for important features and these would normally be used in a simulation.

EGRESS enables an event to be mapped onto the plan to look at the impact it has on the available routes as the event progresses. It allows the impacts of different behaviors to be evaluated, as well effects of congestion and bottlenecks.

EGRESS can model many thousands of people and several square kilometers of plan area, which is typically divided up into separate floor areas connected by stairways, etc. EGRESS has been used for a large variety of evacuation simulations ranging from offshore oil and gas installations, to ships, railway stations, chemical plant, aircraft, trains and places of public entertainment.