F.R.A.M.E. calculation report

This report has been generated by the "FRAME for Windows" programme

The calculation is made for: Airport_building

location: Düsseldorf

The compartiment is: Ankunfsthalle

The occupancy or use is:: airport

Date of the calculation: 2001.11.20

Version: airport_2000_plus

CALCULATION of the POTENTIAL RISKS

Data of the compartment :

The fire load 'immobile' Qi is (in MJ/m²) : 150.00

The fire load ' mobile' Qm is (in MJ/m²) : 400.00

This gives for the fire load factor q : 1.28

The temperature ris T in °C is: 250.00

The average dimension m (in meters) is: 0.30

The combustibility class, M is: 1.00

This gives for fire spread factor i: 0.90

The theoretical length l is: 250.00 meter

The equivalent width b is: 90.00 meter

This gives for the area factor g: 3.61

The level number E is: 0.00

This gives for the level factor e: 1.00

The ceiling height h is: 5.00 meter

The flow of the ventilation system is (in Nm³/h): 2600000.00

The aerodynamic surface of the smoke vents is (in m²): 0.00 m²

The surface of the windows in the roof and upper third of the walls is: 0.00 m²

The smoke venting ratio is: 1.16

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This gives for the venting factor v: 0.94

The height difference with the access level is: 0.00 meter

The number of access directions is: 2.00

This gives for access factor z: 1.10

These data give the following results:

The potential risk P for property is: 4.30

The potential risk P1 for the persons is: 1.19

The potential risk P2 for the activities is: 3.37

CALCULATION of the ACCEPTANCE LEVELS

The following elements determine the possibility of starting a fire:

Main activity:

Non industrial activities

Heating systems:

No heating available: no risk

Heat generator in a fire separated room

Energy source: electricity, coal, fuel oil

Electrical installations:

In compliance with the rules and regularly checked

Explosion hazards:

No explosion hazard

Secondary activities :

This gives for the activation factor a : 0.00

The following elements interfere with the evacuation of the compartment:

The number of persons to evacuate is: 4000.00

The number of exit units is: 72.00

The number of exit paths is: 2.00

The mobility factor p is defined as follows:

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mobile but dependent persons

This gives for evacuation time factor t: 0.37

The following elements define the value of the content:

Replacement factor c1 is: 0.00

The value of the content is estimated at:

200.00 millions EURO

with an inflation correction for 2000 of : 1.00

This gives for content factor c: 0.37

The environment factor r is defined with Qi and M and is: 0.32

The dependency factor d is: 0.30

These data give the following results:

The acceptance level A for the property is: 0.86

The acceptance level A1 for the persons is: 0.91

The acceptance level A2 for the activities is: 0.93

THE ORIENTATION VALUE R_o, The Initial Risk :

The fire resistance of the structure is: 90.00

This gives with the calculated values of P and A, an orientation value Ro of: 2.75

CALCULATION of the PROTECTION LEVELS

The following elements define the value of the water supplies:

Type of storage:

Water storage for general use, automatically filled

The available quantity is adequate

Distribution network:

Distribution network adequate

Hydrants:

The number of outlets is adequate

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Pressure on the network:

The static pressure is adequate

This gives for factor W: 1.00

The following elements define the value of the normal protection :

Notification:

All the elements of the notification chain are present

Manual extinguishment means:

Extinguishers adequate

Hose stations adequate

Arrival time for the fire brigade:

First fire brigade arrival in less than 10 min.

Training of people:

Only a limited number of persons trained

This gives for factor N: 0.90

The following elements define the value of the special protection :

Type of automatic detection:

Automatic detection by smoke or flame detectors

With electronic supervision of the system

With individual identification of small fire zones

type of special water supplies :

Under control of building user (independent)

Highly reliable (double energy supply)

type of special protection:

Sprinklers with one independent water supply

type of fire brigade:

Large professional public fire brigade

Temporary private fire brigade

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This gives for factor S: 14.64

This factor S and the following elements define the value of the fire resistance :

The fire resistance of the structure is: 90.00

The fire resistance of the exterior walls is: 60.00

The fire resistance of the ceiling or roof is: 60.00

The fire resistance of the internal walls is: 0.00

This gives for factor F : 1.08

The following elements define the value of the escape possibilities:

Detection and signalisation:

Automatic detection by smoke or flame detectors

With electronic supervision of the system

With individual identification of small fire zones

Safeguarding of exit paths:

Smoke protected internal stairways

External stairways

Complete evacuation plan with adequate signalling

Protection by:

Sprinklers full protection

Large professional public fire brigade

Temporary private fire brigade

This gives for factor U : 12.04

The following elements define the value of the salvage factor :

Protection and organisation:

Other automatic extinguishing system in critical areas

Safeguarded financial and economical data

Easy access to spare parts and replacements

This gives for factor Y : 1.63

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These data give the following results:

The protection level D for the property is: 14.26

The protection level D1 for the persons is: 10.87

The protection level D2 for the activities is: 21.52

The calculated risk R is for the property: 0.35

The calculated risk R1 is for the persons: 0.12

The calculated risk R2 is for the activities: 0.17

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