WHAT IS "FRAME"?

"FRAME" means Fire Risk Assessment Method for Engineering and is probably the easiest tool for FIRE SAFETY ENGINEERS to define a sufficient and cost effective fire safety concept for new or existing buildings. It is a practical, comprehensive and transparent calculation method of the fire risks in buildings. Unlike building codes that are mostly meant to assure a safe escape or rescue for the occupants, "FRAME" also aims at protecting the building, its content and the activities in it. This method can easily be used to evaluate fire risks in existing situations, and to find out whether alternative designs have also comparable efficiencies.

With the FRAME - method one can calculate the fire risk in buildings for the property and the content, for the occupants and for the activities in it. A systematic evaluation of all major influence factors is given, and the final result is a set of values which express in numbers, what otherwise has to be said by a long description of positive and negative aspects. The method is not suitable for open-air installations.

FRAME differs in some way from the approach of building codes. The method is conceived in such a way that the designer looks first for an adequate protection for the property before verifying life safety. In this way, he will check if additional protection is required for the occupants of an already well protected building. Codes and regulations limit often the theoretical possible choices to those construction methods that have built-in safety. Fire proofing for low hazard buildings can therefore be preferred to sprinklers, and is in most cases less expensive. However, FRAME make the balance between risk factors and protection in the same way as it is done in most fire codes.

FRAME uses elementary fire models and is built like most risk evaluation tools. Starting from a limited number of fire scenarios, consideration is given to the probability of fire, to the severity of the consequences and to the level of exposure. After almost thirty years of application of the method (and its predecessors), the author has hundreds of practical calculations to illustrate the use and effectiveness of this method.

The development of FRAME.

FRAME is developed from a method proposed by the Swiss engineer M. GRETENER in the early sixties, and from various other similar approaches such as: ERIC (Evaluation du Risque d'Incendie par le Calcul), a method developed in France by SARAT and CLUZEL; the German DIN 18230, the Austrian TRBV100, insurance rating systems, etc...

The GRETENER-method was originally made for the property fire risk. Some reports of fires with minor property damage but with fatalities indicated a need for a similar but distinct approach for human fire safety. Consequential loss or business interruption is a third aspect of fire risk that is considered in FRAME, following the same reasoning as for the property and life safety.

The major handicap was the use of tables for the various parameters. It became clear after some tests, that some tables were not enough "fine tuned" to be used as an engineering guideline. The steps were sometimes too large, giving different results from guesswork by different persons on the same job. However, the general balance of factors was good and fitted well with the professional expertise of many of my fellow fire protection engineers.

Therefore, I gradually developed a new method to suit my needs as fire protection designer. Most tables were replaced by formulas for which measurable or identifiable values are used.

Some influence factors were rearranged; others were split up to allow a different or a finer approach. The use of formulas became a rather easy task with the help of a programmable calculator.

In 1980, a second version of the GRETENER-method was published by the Swiss organisation KF-SIA-BVD. It took into account the double fire risk profile (property and life) and added some refinements to reflect the last findings in the fire protection field. In my opinion, some shortcomings of the original method remained and some were even enhanced, but it contained some information, which allowed me to upgrade the method I was using.

When I switched in 1983 to the insurance industry, I realised that fire has another major impact, i.e. the consequential loss or business interruption. Therefore, I developed the third part of the method, following the same reasoning as for the property and life safety. This became the first version of FRAME , which has been in Dutch and French in TD73 of the NVBB-ANPI in October 1988.

After more than ten years of using the FRAME version 1, only a few changes were needed to upgrade it to "Year 2000" knowledge. Only in the area of evacuation time requirements, there was a lack of compatibility with code requirements. FRAME version 1985 did not take into account the requirements for multiple egress capacity, and counted only indirectly with the time passed in staircases. The evacuation time was also underestimated for very congested areas, as the compression effect of a crowd was not properly evaluated.
For business interruption, the salvage factor formula was simplified and the value factor formula was slightly modified to fit the year 2000 monetary values.

SOFTWARE FRAME 2008
All "FRAME" calculations and reports can now be made with an EXCEL spreadsheet that is available in several languages: English, Dutch, French, German, Spanish, Italian and Portuguese. The program is distributed freely with a 60 pages handbook including all formulas and explaining the backgrounds of the method. See at "Software". A xltc -template is available for Office 2010/2011 users , as well as an odt-template for OpenOffice 3.3.

PERFORMANCE BASED FIRE PROTECTION DESIGN.
More recently, it appears that FRAME can be used as a proving tool for "performance based" fire protection designs. Since the balance between the influence factors is a faithful reproduction of most code requirements and general engineering experience, the method can easily be applied to compare the overall equilibrium of an engineered solution to a Code imposed protection level.