Education and Culture DG
Lifelong Learning Programme

FIREFIGHT II

Press Release

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Södra Älvsborg Fire & Rescue Service (SERF), Sweden, has in collaboration with the SP Technical Research Institute of Sweden conducted scientific studies and elaborated the Report the Cutting Extinguishing Concept (CEC) – practical and operational use –, which has been submitted to-day to the Swedish Civil Contingencies Agency (MSB).

The Report presents the results of the scientific studies on the basis of reported and documented experiences from almost ten years practical implementation of the Cutting Extinguishing Concept (CEC). The CEC is a completely new methodology for fighting fires indoors without the firefighters entering into the burning building or compartment. SERF has since 1993 been working successfully with development of methodology for fighting fires indoors and gaining considerable experience of modern firefighting methodologies.

The CEC consists of means for detection and scanning with infra red technology, information and decision support combined with the COBRA cutting and extinguishing technical equipment for precision firefighting as well as positive pressure ventilation created by a PPV fan to optimize the efficiency of the COBRA. To fight fires inside burning buildings is from a workers health and safety perspective an occupation with a very high level of risk and there are therefore requirements for the substitution of conventional methods for fighting fires with new methods, which provide a good working environment for the firefighters.

The Concept has attracted much attention internationally and is the subject of the EU Project FIREFIGHT II (www.eufirefight.com), within the framework of the Lifelong Learning Programme of the Leonardo da Vinci Programme, with a focus on eduction and training mainly in the form of e-learning for intervention commanders and fire and rescue chiefs. The objective is to develop Vocational Education and Training on strategy and tactics related to the CEC for the target group. Partners in the Project are fire and rescue services and fire training establishments and providers and trade union in eight EU countries, with MSB as the Project coordinator.

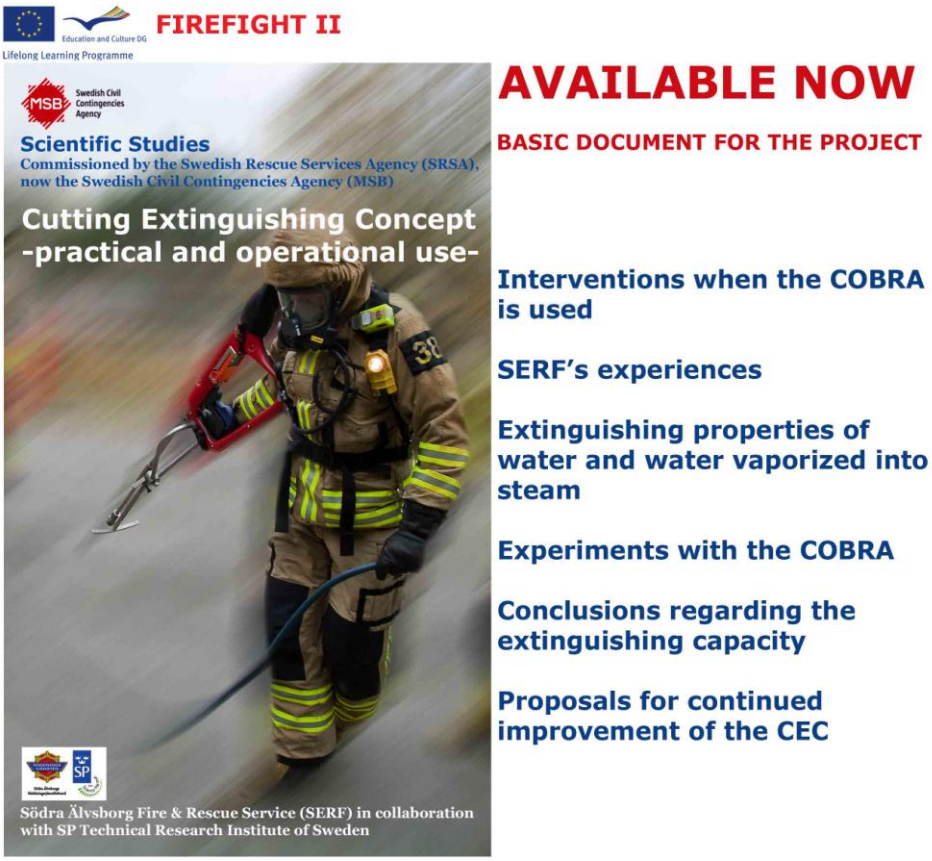
Kjell Wahlbeck the Fire Chief of Södra Älvsborg Fire & Rescue Services **(SERF):**

- The need for technical and tactical development of methods for the fighting of fires indoors is great in the Swedish fire and rescue services and internationally. The risks associated with traditional intervention methods, which largely assume the penetration of BA-operators into the burning building, are considerable and expose firefighters to intense strain.

- Damage caused as a result of interventions using traditional methods is often large and not infrequently caused by the emergency services themselves, due to the choice of the

conventional technical and tactical methodologies, which previously and still are in use but today can be questioned.

- The development of the methodology should lead not only to the reduction of the risks for firefighters and a decrease of the damage in connection with fires, but also facilitate for the firefighters of the future to carry out their work in a more simple and easy way without the physical stress that traditional methods often imply.



Summary

Södra Älvsborg Fire & Rescue Service (SERF) www.serf.se has conducted, in collaboration with the SP Technical Research Institute of Sweden www.sp.se, scientific studies on the basis of reported and documented experiences from almost ten years' practical implementation of the of the Cutting Extinguishing Concept (CEC) or methodology in firefighting operations. SERF was commissioned by the Swedish Rescue Services Agency (SRSA), since 1 January 2009 the Swedish Civil Contingencies Agency (MSB) www.msb.se, to carry out these studies.

To fight fires inside burning buildings is from a workers health and safety perspective an occupation with a very high level of risk and there are therefore requirements for the substitution of conventional methods for fighting fires with new methods, which provide a good working environment for the responders. In consequence, SRSA initiated in 1996 research and development which resulted in the cutting extinguishing tool COBRA and lead to a completely new methodology for fighting fires.

The concept or system, which was developed for this methodology, consists of means for detection and scanning with infra red technology, information and decision support combined with the COBRA cutting and extinguishing technical equipment for precision firefighting as well as high-pressure ventilation created by a high-pressure fan to optimise the efficiency of the COBRA. The COBRA is ready for use immediately on arrival on site. The concept is integrated into normal fire-engine trucks with 1 + 4 firemen but is also a part of the lighter quick response unit with two firemen developed by SRSA, the First Response Unit.

In 2008 there were about 120 COBRAs in operation in Sweden, whereof about 25 in First Response Units and the others in conventional fire-engines. In all, there are now 450 COBRAs in operational use in more than 30 countries around the world. These are installed in different types of vehicles, normal standard fire engines, heavy airport vehicles and light vans as well as in different types of ships.

On the basis of the reports from the dispatched response actions in which the COBRA was used in Sweden (675 operations during the period 2004 – 2008), the experiences have been compiled and distributed under different types of response actions. The results indicate that the distribution is

equivalent to what is normal for fire response actions. The conducted scientific studies of the reported experiences underline the importance of the COBRA's cutting capacity for quickly getting access to the burning compartment or side rooms and taking response action. The studies indicate that the COBRA is chosen in order to avoid the risk for ignition of the accumulated fire gases and enable the fire to be attacked directly through the building's construction and achieve a quick influence on the development of the fire.

The COBRA will mainly exercise influence on the fire by a combination of cooling and inerting, i.e. the mixture of fire gas and air will become overcarbonized and turn into an inert or noble gas as a result of the inflow of water, which is vaporized into steam. The content of oxygen will then decrease in relation to the concentration of flammable gases, which then cannot burn (the flames are suffocated).

In the report of the studies, the conclusions concerning the Cutting Extinguishing Concept are summarized as follows:

- the COBRA cools efficiently the fire gases and stops the fire from developing as well as inerts the fire gases even when their temperature is low
- high-pressure ventilation is facilitated due to the capability of the COBRA to control the fire gases before the ventilation is started
- the COBRA enables a quicker start of the action against a fire and the fire gases during an intervention
- the COBRA provides more methods for extinguishing fires which are generally considered difficult to handle and for getting access to, for instance, fires in double flooring, roofs and attics
- the tactical choices have increased when different methodologies are combined i.e. IR technology, the COBRA and high-pressure ventilation as well as secure and safe indoor firefighting
- high quality education and training will increase the implementation, improve the efficiency and enhance the credibility in general of advantages of the Cutting Extinguishing Concept
- damage to property as well as the negative consequences for the environment caused by conventional firefighting using large quantities of water decrease considerably and often completely with the COBRA
- the COBRA improves the working environment for firemen when extinguishing fires in buildings from the outside
- the COBRA methodology has increased the health and safety of firemen when responding to fires inside buildings

The report presents how SERF works with the Cutting Extinguishing Concept and this concept in combination with other methods and technology. Also studies and research concerning the capacity of water and vaporized water drops into steam to extinguish fires as well as an overview of the experiments which have been conducted with the COBRA and their results are presented in the report. Four different cases of fire interventions conducted by SERF in which the CECs have been implemented are presented extensively. Finally, proposals are made for future work and further development of the COBRA.

The COBRA is used actively for fire interventions in different parts of Sweden, but there is a clear need for improved knowledge about how the actions for the extinction of fires should be conducted

and what the effects of different types of interventions really are. Improved knowledge would enhance and facilitate the exchange of experience and learning lessons within the fire and rescue services and speed up the introduction of the new methodology and technology in the whole of Sweden.

An education and training encompassing the whole Cutting Extinguishing Concept has been established in Sweden and forms part of the basic training of firemen, part time firemen and intervention leaders. As a result of the EU Project FIREFIGHT, within the framework of the Leonardo da Vinci Programme, an e-learning package which can be used by a pupil at home, supplemented by a short practical training for firemen, was elaborated. The Partners in FIREFIGHT included fire training facilities in England, France, Spain and the Czech Republic and SRSA was the coordinator.

Work now continues in the EU Project FIREFIGHT II (www.eufirefight.com), within the framework of the Lifelong Learning Programme of the Leonardo da Vinci Programme, with training for intervention commanders and fire and rescue chiefs as the target group. The objective is to develop Vocational Education and Training on strategy and tactics related to the CEC for the target group. Besides the original Partners, fire training facilities in Estonia, Finland and the international (SME) EducExpert France and SERF have joined as Partners in FIREFIGHT II. MSB is the Coordinator, with Bo Andersson as the Project Leader.

The study proposes that the training facilities are adapted so that these can be used more efficiently for the training of the complete CEC, i.e. IR technology, the COBRA and high-pressure ventilation. The present training establishments and their equipment for conducting fire extinguishing training are not very well suited for exercising the tactics that are needed for the CEC, for instance in respect to the cooling and inerting of the mixture of fire gas and air, in particular in a compartment with a considerable volume.

Another conclusion is that the intervention reports clearly demonstrate a need for an improved and developed methodology for learning from the experiences of the response operations. The reports at present rarely contain an analysis of the appropriateness, efficiency, etc. of the implemented methodology. There is on the other hand a clear need to evaluate systematically the experiences of new methodology and technology to allow for learning from the incidents that occur and create better conditions for exchange of experience, not in the least of the practical operational use of the Cutting Extinguishing Concept.