

Presentation at the 1° Convegno Internazionale  
"Investigating the Causes of Fire" in Roma / Italia, 2008

# Survey of the Departments "Fire and Explosion Investigation" in Europe

- Fields of Work, personal and technical Equipment -



# Preface

## 1. Prehistory:

- *Inducement:* Invitation to give an oral presentation at a Meeting of Insurance Companies in Cologne/ Germany in April 2007 with the title "Inquiries and investigations of Fire and Explosion causes in Foreign Countries".
- *Next step:* Information of the chairperson of the ENFSI group about this German congress and proposal to present the results of the Questionnaire in details at the Meeting in Linköping / Sweden.
- *Third step:* Invitation by Cristina d'Angelo to give an oral presentation at this Congress in Rome in February 2008.

# Preparation

## 2. Gathering questions like:

- *subordination of the Fire Department to a Forensic Institute,*
- *subordination of the Forensic Institute to a Ministry,*
- *other official or private organisations working at the field of fire Investigation,*
- *field of work,*
- *educational level of employees,*
- *technical equipment for work in scene and in the laboratory,*
- *duration of training for the job,*
- *strategy of courts regarding non-impartial experts,*
- *existence of a ISO/IEC standard*

## 3. Formulation of the Questionnaire

# Questioning and Response

4. Forwarding of the Questionnaire to all ENFSI laboratories in Europe via <wg-fire@unil.ch> on 22.01.2007
5. Receipt of answers from almost all laboratories immediately and of some other later
6. Second request necessary by Emails or phone call
7. Partial excerpt of data for use at the meeting in Cologne
8. Detailed excerpt for use at the meetings in Linköping and in Rome

# Questionnaire

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ENFSI - wg 'Fire & Explosion Investigation'  
*sub-committee* 'Explosion Investigation'  
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## **Questionnaire** concerning the organisation of Fire and Explosion Investigation Departments in Europe

1. Is your '*Department of Fire and Explosion Investigation*' part of one of the following *Organisations*?
  - a Forensic Science Institute
  - an Institute of a University
  - an 'Institute for Testing of Materials'
  - another Organisation e.g. Fire Brigade etc. - please state: .....
2. Is the *Organisation*, your *Department* is part of, annexed to one of the following *Ministries*?
  - The Ministry of Home Affairs / of the Interior
  - The Ministry of Justice
  - The Ministry of Culture and Science
  - another Organisation - please state: .....

# Questionnaire

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3. Are there *other official organisations* (rather than private companies) that investigate fires in your country?
  - an Organisation like "Forensic Science Service Ltd." in UK
  - another Organisation - please state: .....
4. For those Organisations that do *not* do *their own scene investigation / laboratory analysis* - who does it for you?
5. In which of the following *fields* do you work?
  - only at *scenes* of Fires and Explosions
  - only on *lab examination* of Fires and Explosions
  - both at *scenes* and in the *lab*

# Questionnaire

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6. Is investigation of explosive explosions at scenes and explosive analysis in the laboratory part of your work?
7. What is the *educational level* of the persons who *investigate* fires and explosions?
  - Police personnel with specialist training
  - Scientists with
    - Diploma or equivalent graduate level qualification
    - M.Sc.
    - Dr. / Ph.D., Field: .....
  - Engineers

# Questionnaire

- 4 -

8. What *technical equipment* do you use when working at *scenes*?

- protective clothing
- detector for explosive atmosphere
- photo-ionisation or other detectors for volatile hydrocarbons
- other - please state: .....

9. What *technical equipment* do you use when working in the *laboratory*?

- detectors for volatile hydrocarbons
- gas chromatographs
- mass spectrometers
- ion chromatographs
- apparatus for flammability testing of building materials and components
- apparatus for flammability testing of flammable liquids



# Questionnaire

- 5 -

10. Where were you *trained as a Fire and Explosion Investigator*?

- in your Institute, for ..... years
- in a University with a "Criminalistics" or "Forensic Science" Faculty, for ..... years
- other - please state: .....

11. What is the policy of courts in your country towards *non*-impartial experts (some private experts, experts instructed by an Insurance Company etc.)?

- Are they in principle accepted?
- Are they generally rejected?
- Are they rejected in individual cases if they are proved to be *non*-impartial?

# Questionnaire

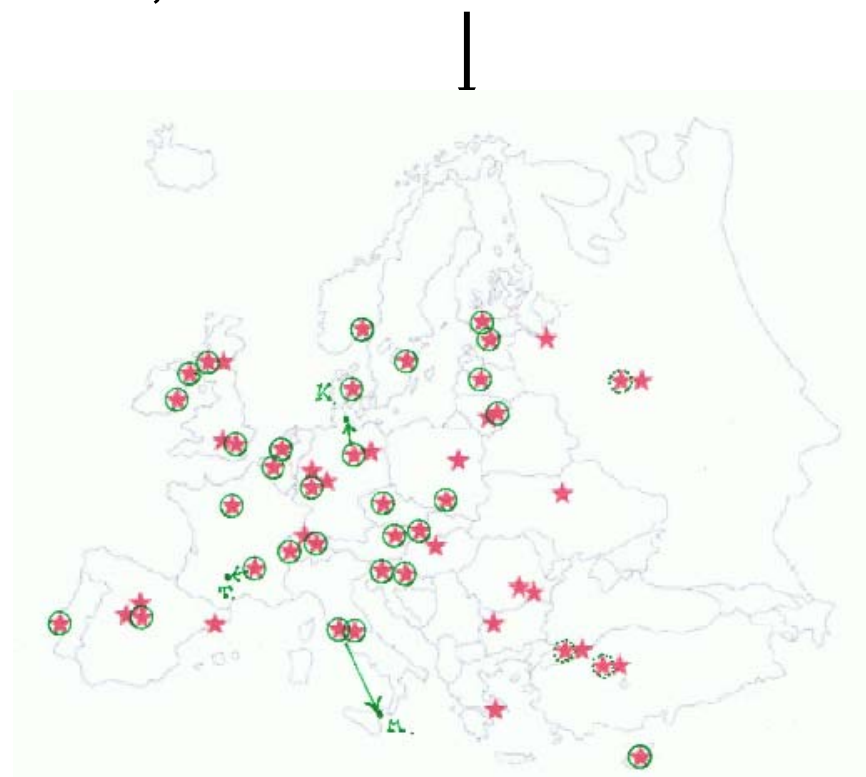
- 6 -

12. Does there exist in your institute a strategy to introduce a concept of *measurement uncertainty* like by the standard ISO/IEC 17.025?
13. Can you give any further comments to your work?

# Results

- 1 -

- Participation of Forensic Science Institutes:
  - number of Laboratories: ~ 54, committed to F&EI: ~31

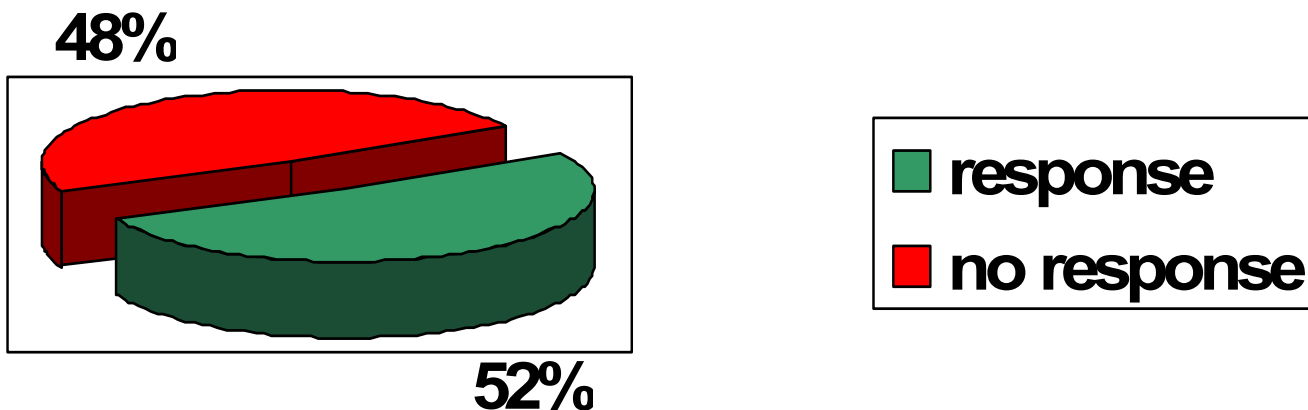


- number of answers from Forensic Science Inst.: 28

# Results

- 2 -

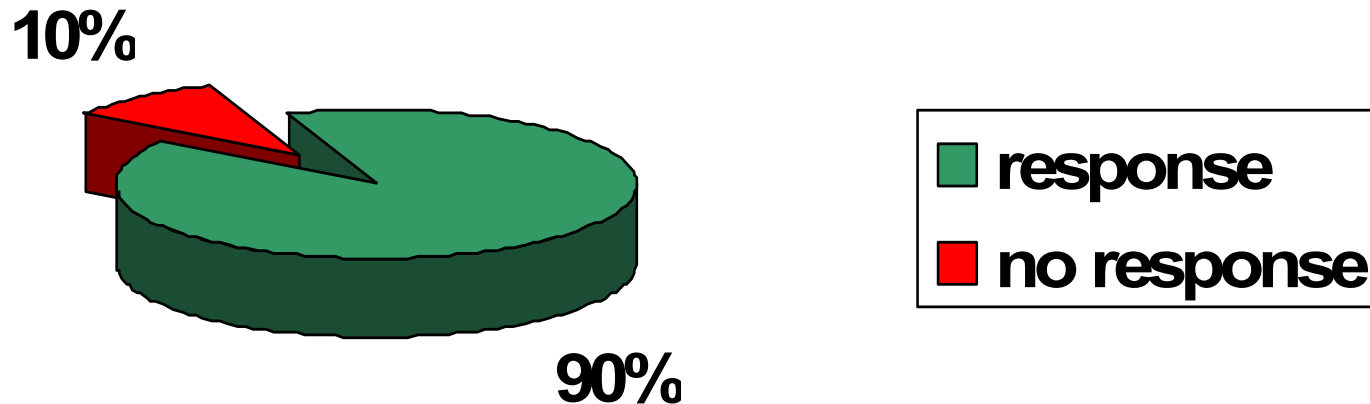
- Percentage of responses (28), relating to the number of all ENFSI Institutes as basis (~ 54):



# Results

- 3 -

- Percentage of responses (28), relating to the number of ENFSI Institutes which cooperate in the F&EI Working Group (~ 31) as basis:



# Results

- 4 -

1. Different kinds of laboratories:
  - Forensic Science Institutes: 22
  - Institutes of a University: 02 ('Strathcl. Univ.' + 'UNIL')
  - Institutes for Testing of Materials: 01 ('DIFT' / Danmark)
  - another organisation: 02 (Police + Military Force / Ital.; Dep. of Fire, Public Rescue and Civil Defense)
2. Superior Ministry:
  - Ministry of the Interior: 14
  - Ministry of Justice: 10
  - Ministry of Culture and Science: 02
  - another Organisation: 02 (Police Organisation)
3. Other official Organisations:
  - Police / University Laboratories / 'FSS': 13
  - Fire Research Institutes / Fire Brigades: 07
  - none: 07

# Results

- 5 -

4.	Supporting Institutes:	
	University Institute:	01
	accredited Institute:	02
	private Experts:	02
5.	Fields of work:	
	<u>only</u> at scenes:	01
	<u>only</u> on lab examination:	05
	<u>both</u> at scenes and in the lab:	22
6.	Investigation of explosives explosions:	14
7.	Educational level:	
	Police personnel:	10
	Scientists:	27
	Engineers:	12

# Results

- 6 -

## 8. Technical Equipment for scene:

protective clothing:	21
detector for explosive atmosphere:	07
detector for volatile hydrocarbons:	07
'arson dogs':	06
electrical equipment:	03
other (thermographical camera):	03

## 9. Technical Equipment for lab:

detector for volatile hydrocarbons:	08
GC / GC-MS / IC:	26 / 21 / 11
Testing apparatus for flammability / build. mat.:	07
Testing apparatus for flammability / liquids:	08
other (IR, DSC, SEM, XRF, electr. equipm.):	08



# Results

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## 10. Training in Fire and Explosion Investigation:

in the Institute:	24
in a University:	04
at another place (technical school, court):	04
duration of training:	~1 to 5 years; "15, 30 years"

## 11. Policy of courts towards non-impartial experts:

in principle accepted:	17
generally rejected:	05
rejected in individual cases:	07

## 12. Concept of measurement uncertainty (ISO/IEC 17.025):

existent:	16
not existent:	12

# Results

- 8 -

## 13. Further comments to the work:

*Some colleagues (nine)* gave recommendations like:

- more training of "new blood" in the institutes - for work at scenes as well as in the laboratory
- especially focussing the training of lab work on interpretation

*One colleague* described the situation in his country:

he is disappointed because mistakes which were done by badly trained Police Officers as scene investigators can not be repaired by him in the lab.

*Another colleague* described the work of Fire Investigation as:

"a plural approach entering many specialities: physics, chemistry, building..., sometimes difficult to bear for the brain...."

# Results

- 9 -

## 13. Further comments to the work (contin.):

*Yet another colleague* divides the work of his institute into 3 main categories:

*"teaching of F&EI, scientific research and investigation/analysis for the justice. These 3 aspects are interconnected and could not be considered separately."*

*This colleague* remarked furthermore:

*"Concerning the activity of expertise, our work is always undertaken in close collaboration with the forensic service of the police forces in charge of the case.*

*Quite all members of our department share their activity with a charge in a state police as either fire investigators or as forensic scientists."*

# Results

- 10 -

## 14. Further comments to the work (contin.):

*Another colleague again* complains that there doesn't exist in his country

"an organisation which investigates all aspects of fire or gas explosions. Chemists of Police ... generally search accelerants, fire-fighters look at other aspects (electric trouble etc.) and generally the court selects all experts who he wants (a university professor in chemistry, an engineer or police forensic units)."

## 15. Important awareness:

Especially many smaller institutions work at *all fields*: at *scenes* using the three different procedural methods of investigation and apply in their *laboratories* all appropriate analytical methods to obtain *best results*.

# Special aspects

- Choice of terms: *impartial / independent*:

*Pronouncement:* All experts are *non-independent*, but some are *non-impartial* - regrettably. So I used the term *impartial* in the questionnaire.

*Justification:* All experts work after an order to investigate and therefore they are *non-independent* - so they *depend* on a *police organisation*, an *Office of public prosecutor* or a *court* which place an order.

- Problems:

*Problem 1:* Some experts *crave for admiration* or are *complaisant*, give wrong expertises, and they hope to get many follow-up orders to become more and more rich - but they disregard the *veracity* which an expert should possess. They are *charlatans*.

*Problem 2:* Many judges are not dedicated to avoid *Problem 1*.

# Closing remarks

- The experts which cooperate in ENFSI are very keen to deliver *objective* and *impartial* results, also ambiguous or multicausal ones.



- *Accreditation* of experts and the application of a *concept of measurement uncertainty* will be adjuvant to enhance the objectiveness.
- But the *best way* to produce objective expertises is that the experts feel *always absolutely impartial*, and it is the commitment of the superiors of their authority that they can work *in the absence of any advise*.
- Many thanks for your attention!