

# **SMC AB**

## **– The Swedish Solution in Fire Fighting in the Oil Industry**

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**Conference in Rotterdam**  
**Mutual Aid and PPP in Port and**  
**Industrial Areas**

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# Släckmedelscentralen SMC AB



- **A company mutually owned by the oil companies in Sweden, with the task of extinguishing fires in oil depots**
- **Agreements on co-operation with the Rescue Services in 4 cities (4 Regions).**
- **Special equipment at 4 depots**
- **Continuous exercises and drills at various depots**
- **International network**



# Släckmedelscentralen SMC AB

Freely translated ref. to Swedish Law,  
The Law on Prevention Of Accidents  
(SFS LSO Chapt. 2 § 4)

*” It is the plant owner’s responsibility to provide an emergency preparedness with organization, equipment and personnel to a reasonable extent, on such facilities where an accident may cause serious consequences for human beings or the environment”.*



# Buncefield UK, 11 Dec. 2005





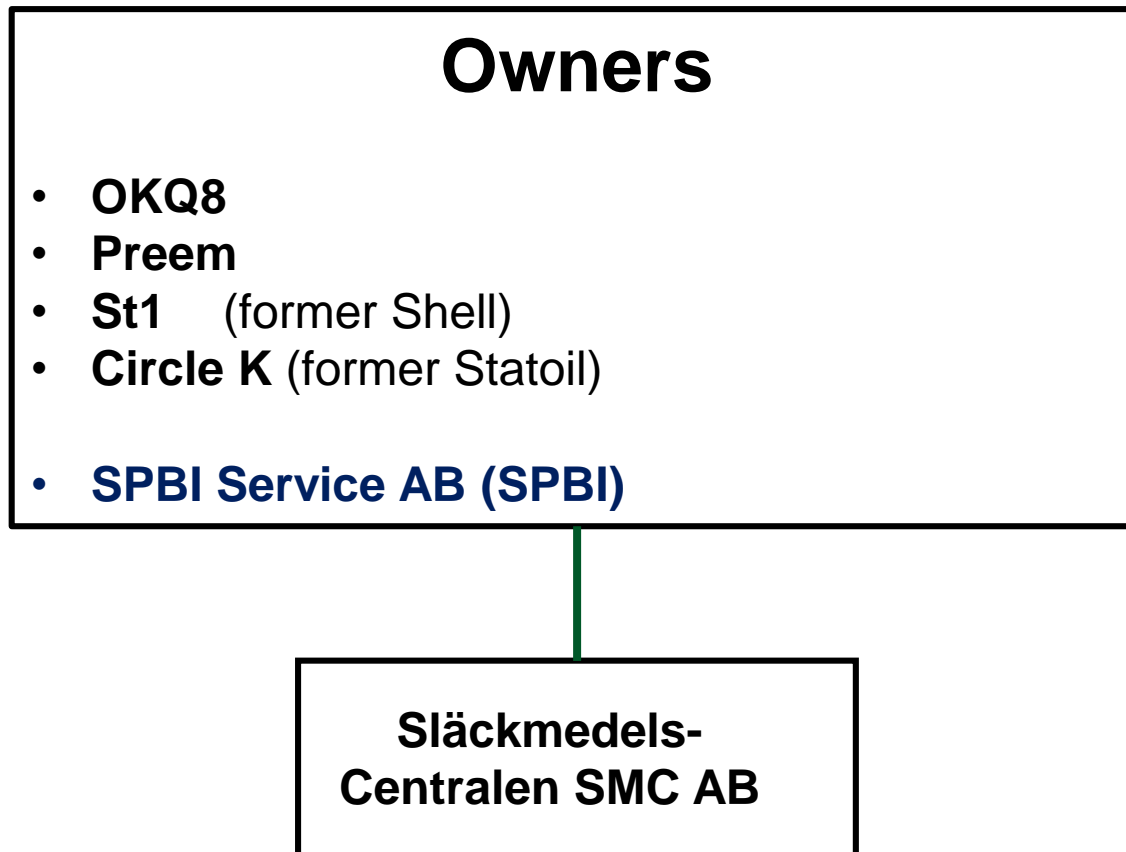
# Släckmedelscentralen SMC AB

## - History

- Investigation from 1992 -1995
  - Swedish Petroleum Institute (now SPBI), SP Technical Research Institute of Sweden, Authorities, and Rescue Services etc.
    - Design rates, Dimensioning issues, Capacity
    - Equipment
    - Tactics
- Founded in 1994
  - Oil companies having consulted with relevant authorities.

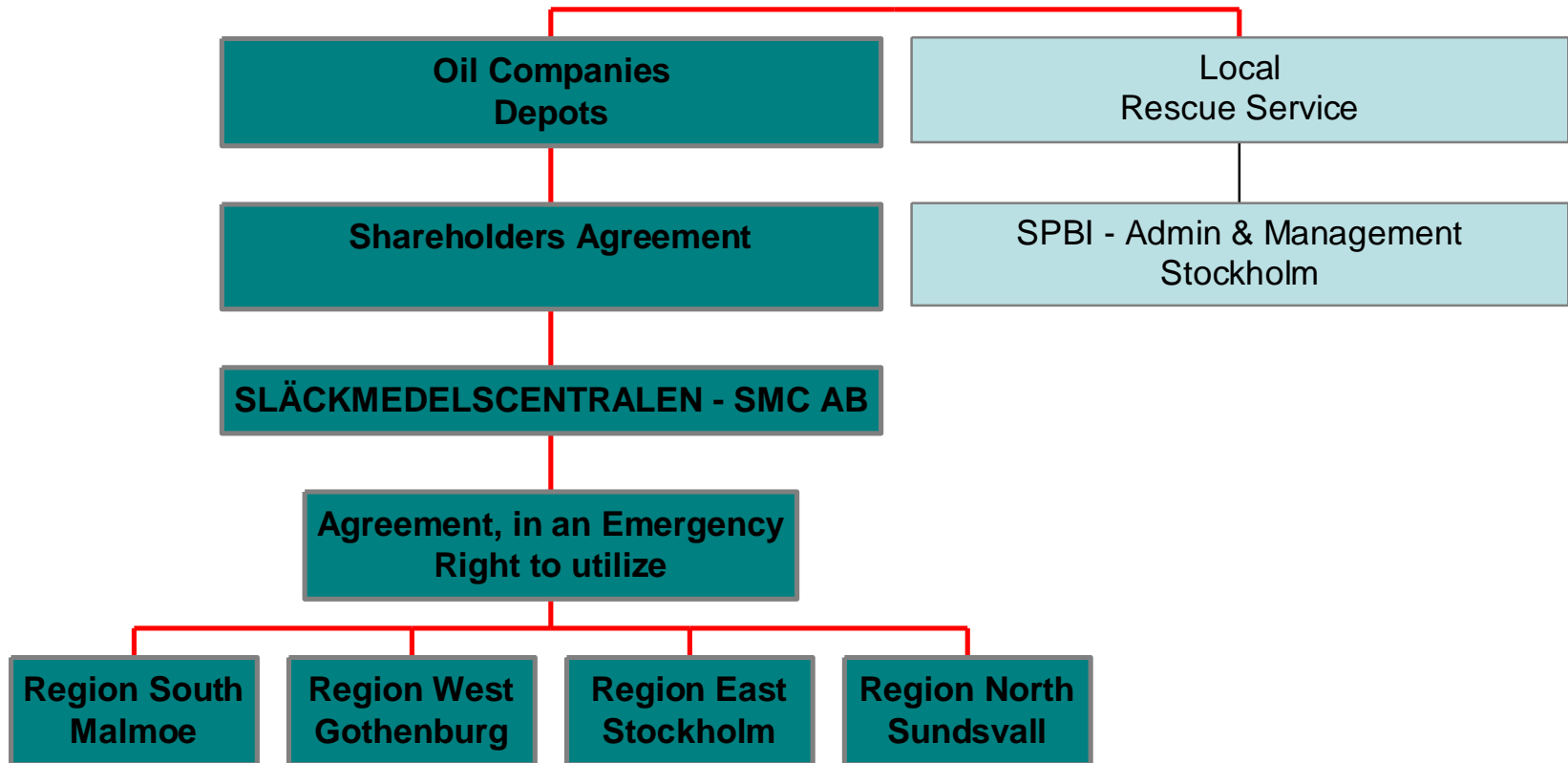


# Structure & Organisation



SPBI is responsible for the Admin. work in the SMC AB

# SMC - Organization





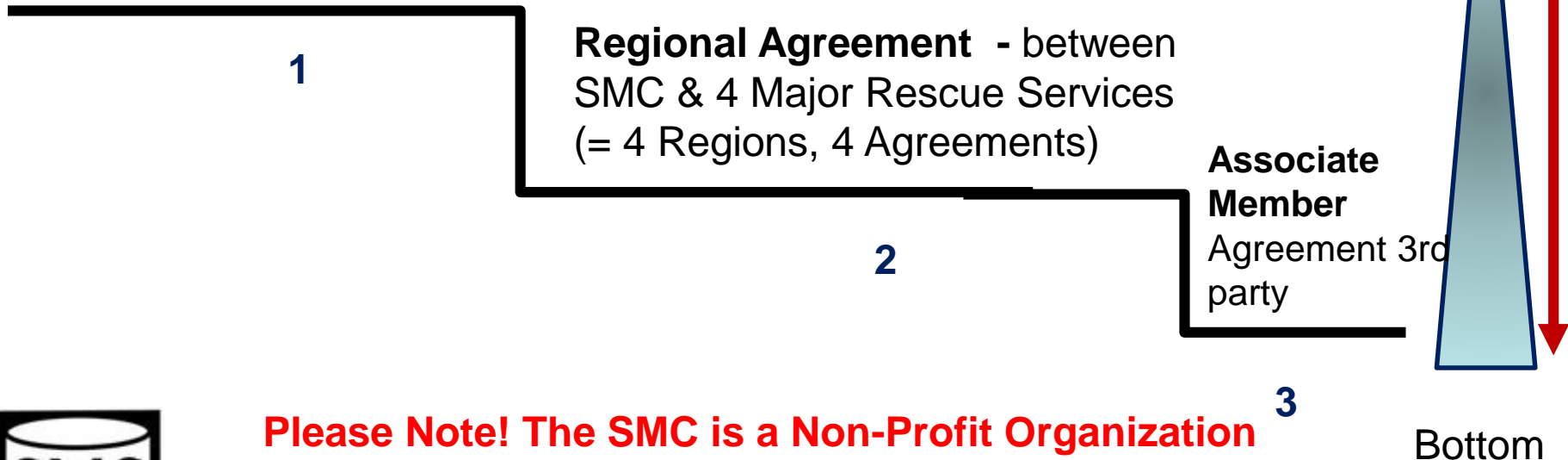
# Agreements between Parties

## – Governing Principles & Documents

**3 Levels of Different  
Governing Agreements:**

### **The Owner's Shareholders' Agreement:**

- Share distribution, Financing, No. Of Shares
- The Owner's Tasks Duties and Rights - Voting
- Principles of Admin. & Governing (Board, meeting)
- How to resolve different interests
- Lay Down Principles (or conflict solving)



**Please Note! The SMC is a Non-Profit Organization  
- Cost Sharing Philosophy applied Only !**

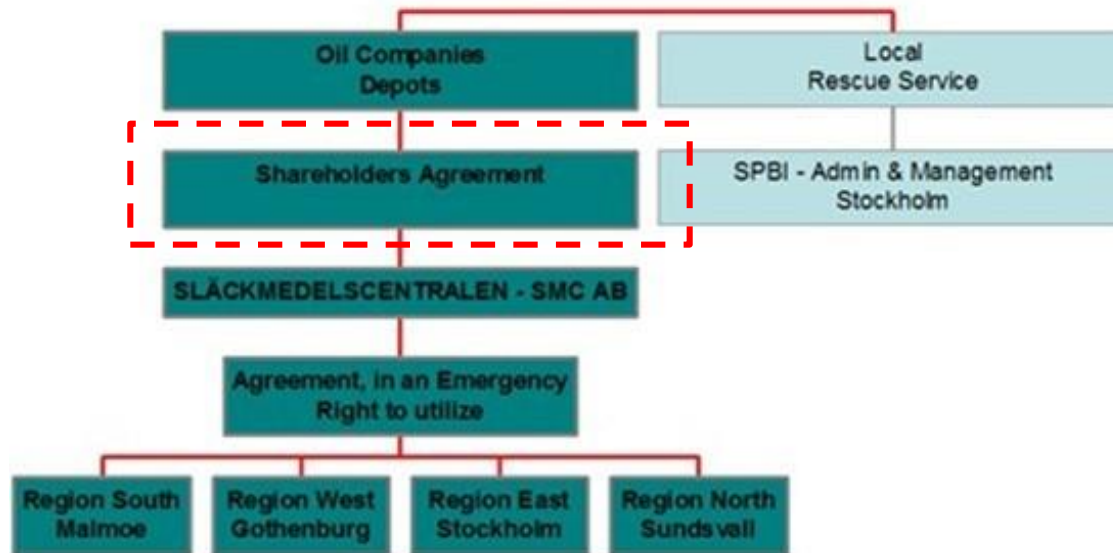
# Organization

- Släckmedelscentralen SMC AB
  - No employees. Non-Profit Organization.
  - Administrated by SPBI, Stockholm, Sweden
- Agreements with Rescue Services
  - Sundsvall Fire & Rescue Service (Region North)
  - Stockholms Fire & Rescue Service (Region East)
  - Gothenburg Fire & Rescue Service (Region West)
  - Malmoe Fire & Rescue Service (Region South)



# Shareholders Agreement

in Swedish "Konsortial avtal"

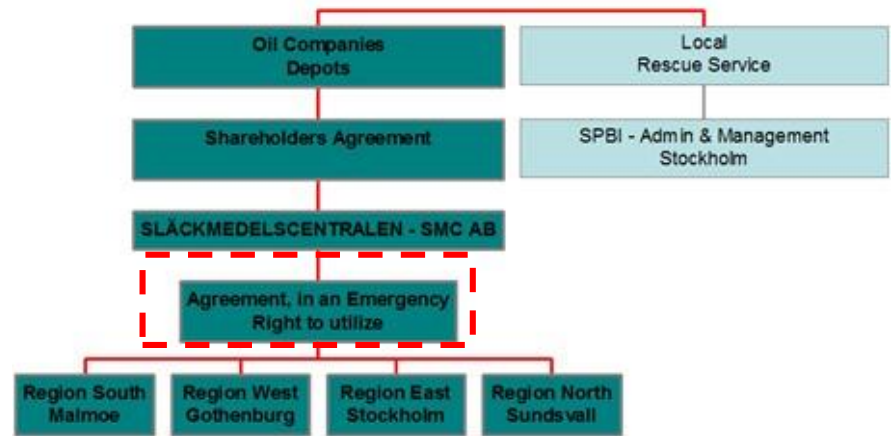


- Describes Governing Principles
- Clarifies tasks, duties and rights (for owners)
- Legally committing
- Entails Statements on Board Meeting rules and Governing Principles of the SMC Company



# Agreement with Rescue Services (Regional Agreement) *Entailing:*

- SMC Equipment in store
- Funding for Service of an "SMC Coordinator"
- Rescue Services' right to use the equipment
- SMC Coordinator's duties
- Training and Competence
- Drills
- Maintenance



**The Rescue Services do the actual work within their own organisation(s).**

**The SMC provides**  
- Funding  
- Admin. + Management

# Associate Members through Agreement

- AFAB (Arlanda Fuel AB)
- Inter Terminals /Ex. VOPAK/
- Nordic Storage
- Scandinavian Tank Storage
- CMP - Prövestenen (Copenhagen Malmö Port)
- Almer Oil & Chemicals
- Stena Oil AB
- Wibax AB
- Karlshamns Harbor
- Skoogs Tank

**Discussions continues with other companies**



# Funding & Governance Principles of the SMC (as from 1994 – Present Day):

- ❑ Every Owners Capital Share is distributed out from Sales Markets Share of gasoline sales. Re-distribution of Shares every 5th year.

**This is due to Historical reasons:**

**The SMC was intended to extinguish very large gasoline fires. *The future looks different (not only gasoline).***

- ❑ Owner Company with > 10% has right to appoint a Board Member
- ❑ All legislative requirements applies for a "traditional company".  
That is to say compliance is mandatory for all laws and regulations on Taxes, Accounting, Reports etc., as any ordinary company.
- ❑ Share holders are for the time being invoiced an operational fee, in advance 2 times/y corresponding to 20% of the new purchase price of equipment. Investements, i.e. for new equipment, are charged as loans from owners.
- ❑ Over- or under funded amount is cleared in the end of each year.



# Funding Principles 2017 – Onwards

## Principles of Cost Sharing (Non-Profit)

### Principles

- Each Shareholder pays a Service Fee, in proportion to **actual costs**.
- Annual Service Fee, is charged Share Holder(s) with costs from cost driving variables, i.e. drills, transportation, fire fighters allowances etc.
- The total actual cost proportion is calculated from a net sum (after deducted income) times a weighing Factor(s):
  - **Big size depot Factor 1**
  - **Average size depot Factor 0,5**
  - **Small size depot Factor 0,2**
  - **Non-gasoline depots Factor 0,8**



### Depot Company A Factor

|   |     |
|---|-----|
| 1 | 1   |
| 2 | +   |
| 3 | +   |
| 4 | 1   |
| 5 | +   |
| 6 | 0,5 |
| 7 | +   |
| 8 | +   |

Example

....  
Total for **Company A** = 2,5 p.

Assume All Shareholder Company B, C, D, etc., gets for example the total sum of points together = 8,75 p.

Assume annual cost = 8,500 MSEK/y  
 $\frac{8,5 \times 10^6}{8,75} = X;$

$X * 2,5 \text{ p.} = \text{Company A's payment share as shareholder}$

# Cont'd - Revised Funding Principles

- **Other incomes such as**
  - **Annual Fees from External Agreements**
  - **Payment for being called in to service**
  - **Rental fees etc.**

**Are deducted from the total annual cost before split between shareholders.**

**This sum, in previous picture represents the budget figure 8.5 MSEK / Year (~ 850.000 €), is the base for calculation of every other shareholder's annual fee.**

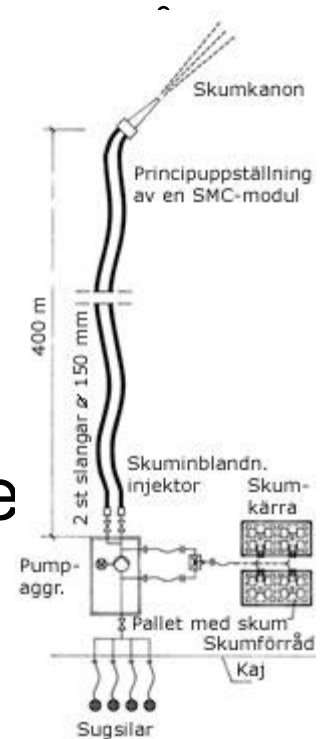




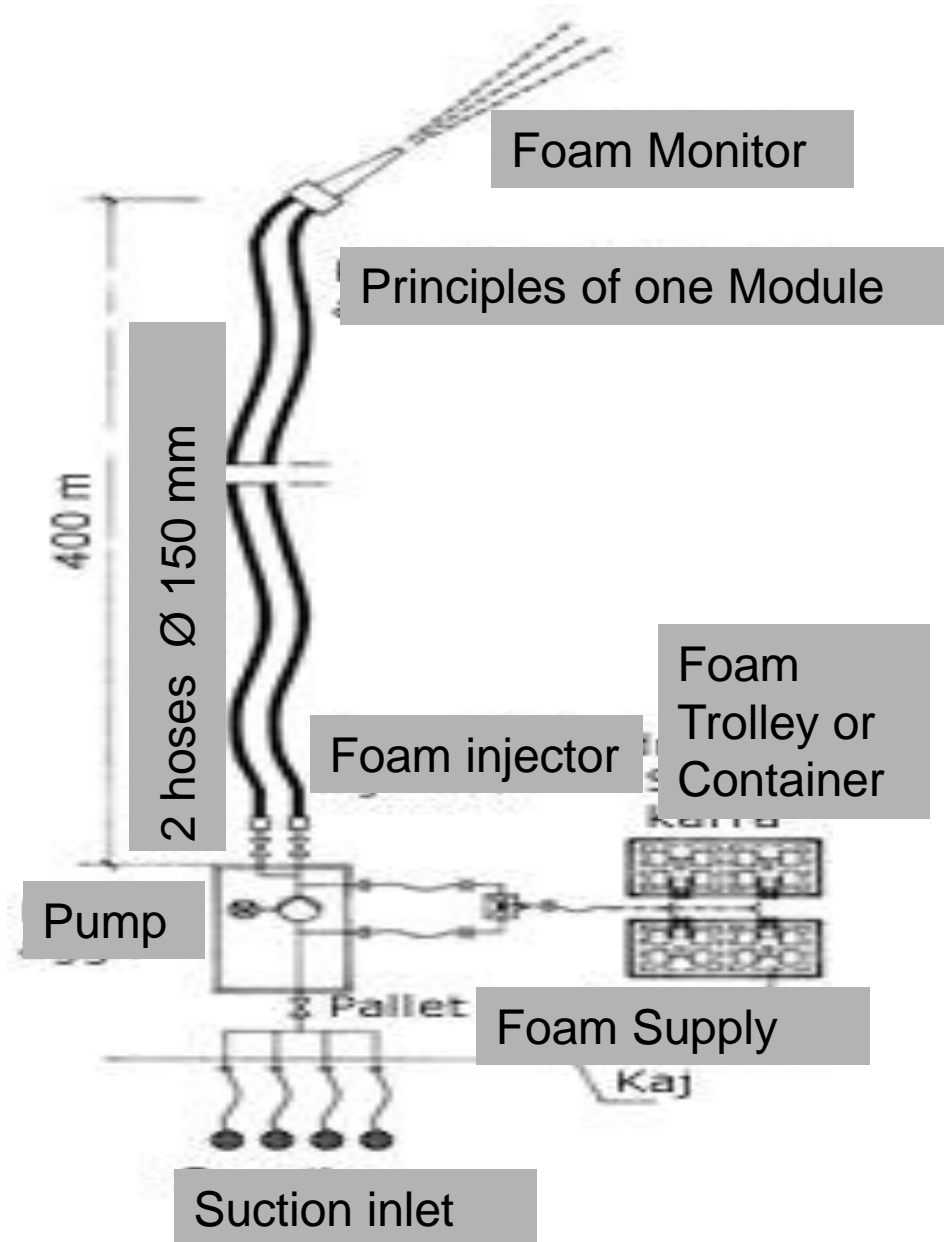
# Equipment - 1 module

8 modules in total in SMC AB, All 4 Regions (2 Modules / Region)

- One diesel propelled pump - capacity 10.000 litres/minute.
- 2 x 800 metres Fire hose, diameter 150 mm (6 ").
- 16 tonnes foam liquid (alcohol resistant).
- Equipment for 3 % and 6 % foam mixture
- En foam monitor with a capacity of 8000 litres/minute.



# Principles - one SMC Module



# Training and Exercises

- **Guideline / Manual Exist.** Developed and used for new SMC Team members. New training for new members conducted every 3 - 4th year. Usually 20 + individuals each time (one full week).
- **Location:** GESIP (Vernon), France. Use of tutors and experienced fire fighting officers invited, who have been successfully extinguishing live tank fires themselves. Training is both in theory part, and an extensive practical exercises part.
- **Planning for drills on all terminals - 5 year shedule horizon.** *Minimum 2 drills per SMC Region / y a requirement. All sites in the country – **with agreements only** - are to be visited and having done an exercise within 2-3 years frame (equipment and manning fully deployed).*



# **Authorities – SMC Activity Planning,**

- **The Authority (-ies) relevant to SMC activity is annually invited to send an observer/attendee to the Annual SMC Planning Conference. Here the planning is settled, and long term decisions are taking place. Follow - up etc.**
- **Authority Representative : Invited to attend and follow the planning and of course attending in the presentations or discussion as being given. Usually this is a 2 day event (Noon to Noon).**
- **SMC Board meetings (4 / year) are however closed to external parties.**



# SMC Co-operation and Network

- **Extensive Contact Net World Wide**
- **ETANKFIRE Steering Committée Member**

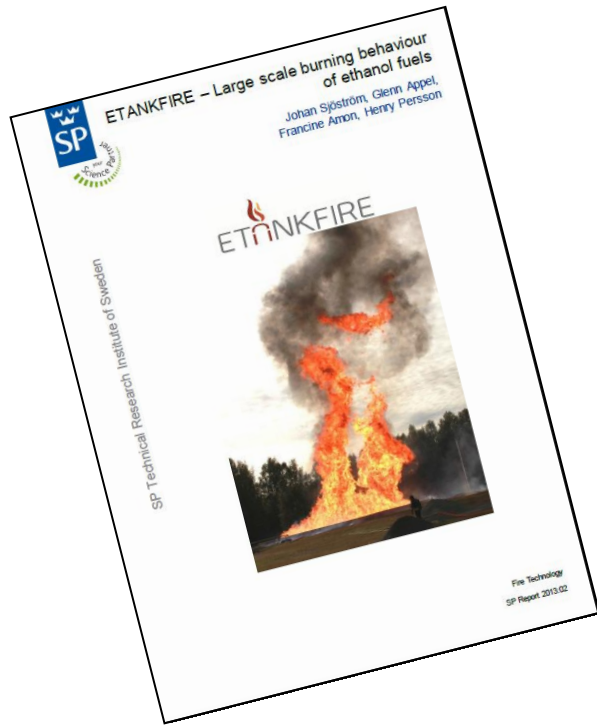
Funding of scientific tests, Ethanol etc.

Developed as a special software for heat flux radiation and cooling to prevent fire escalation in oil or fuel terminals

- **LASTFIRE Member** (Low Atmospheric Storage Tank Fire). Oil Industry Fire Experts Network & Research Organization.



# SP Ethanol Fire Test, Borlänge in Sweden 28th August, 2012



# Ethanol fires in Port Kembla, Vilette-sur-Aube, Lillers, Ourinhos



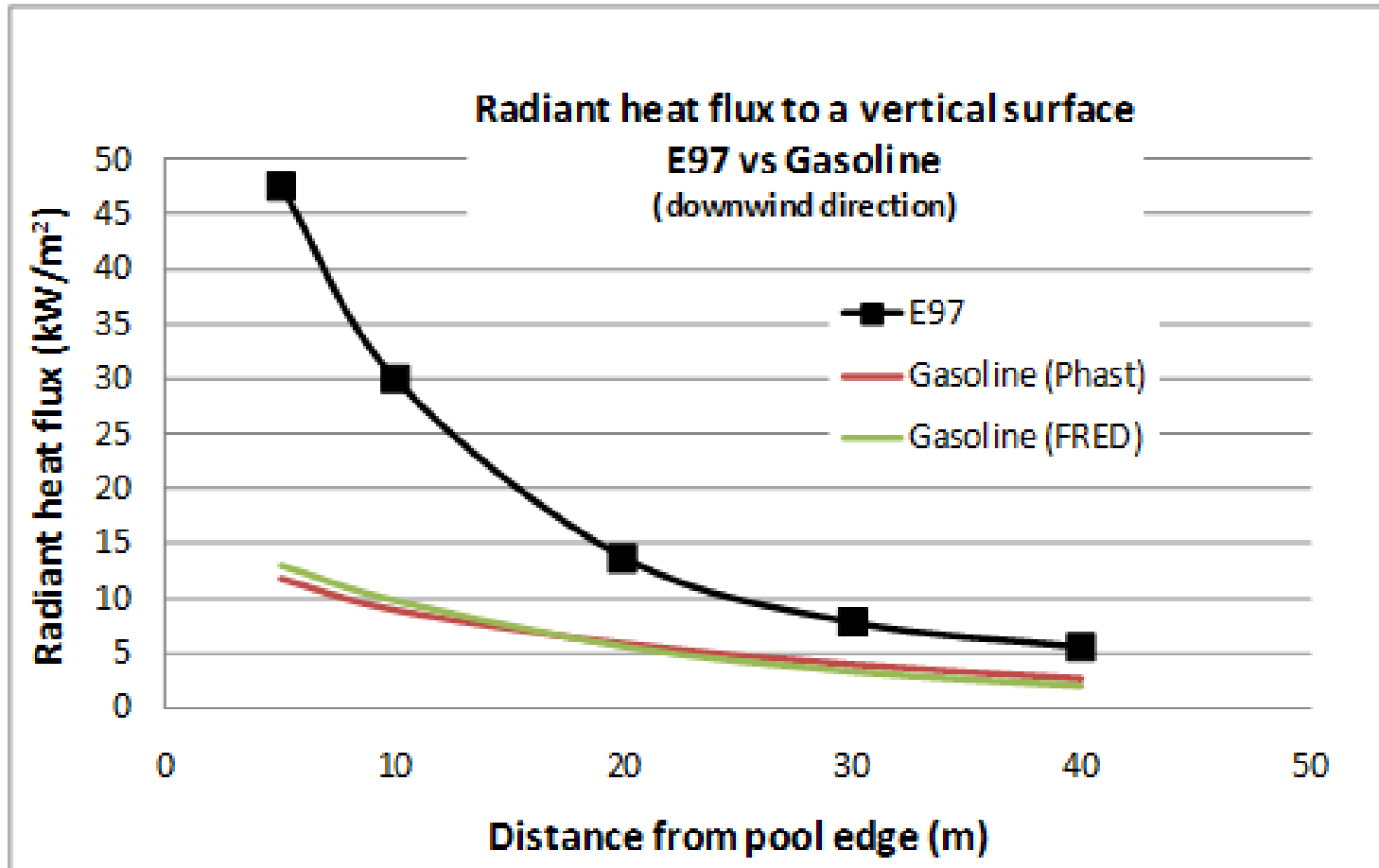
Photo DRIRE Champagne-Ardenne



Photo : DRIRE Nord - Pas - de - Calais

**Very difficult** so far, acc. to experience, to extinguish a large scale ethanol fire

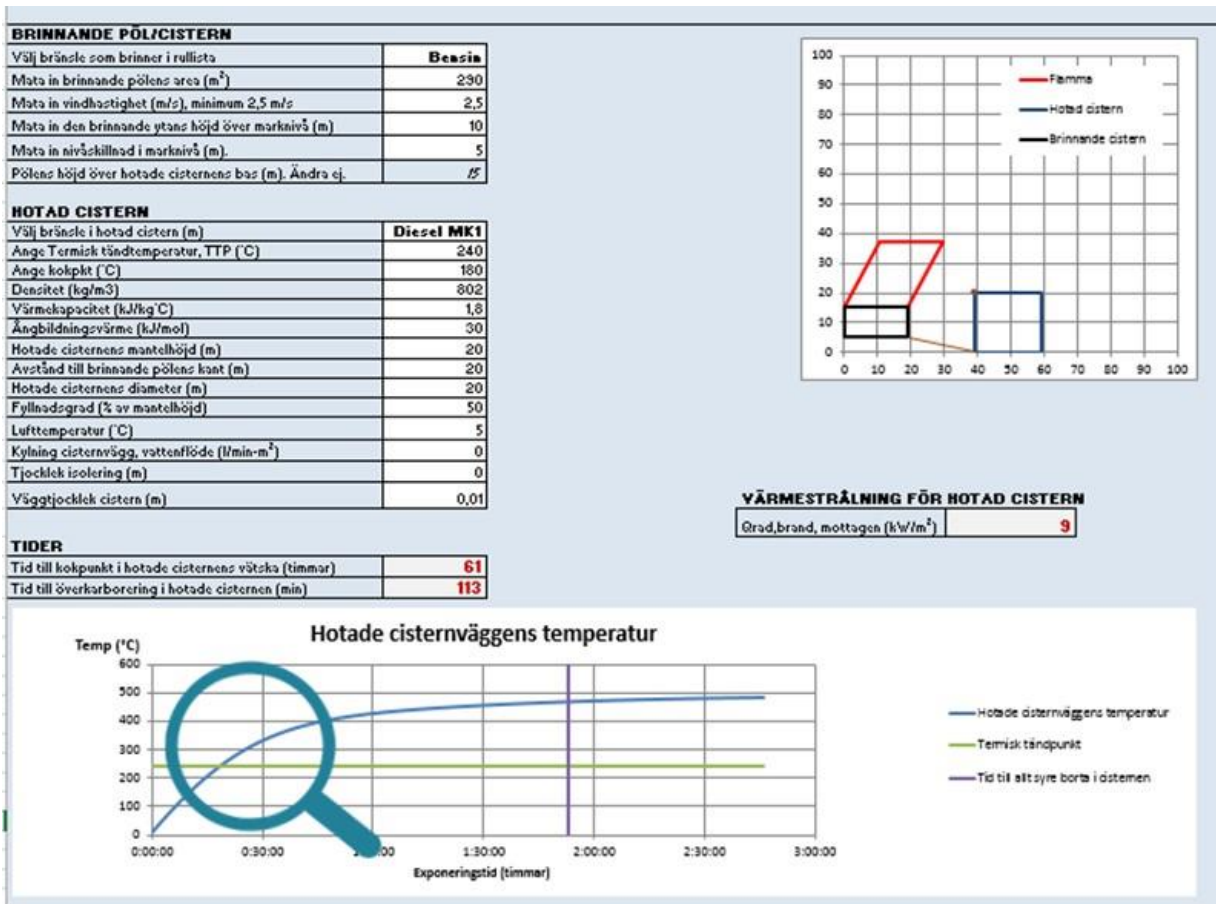
# Heat flux downwind– Gasoline vs E97





# Special Software – Fire Modelling

Entailing Ethanol Heat Flux Characteristics (and of course other fuels). Guideline + Recommendations.



User Friendly

Different scenarios



# Tactics

- Important to know Site layout and Facility arrangements:
  - Pump position (prevailing wind, distance to water) etc.
- Wind direction important. Increased foam mixture – Shorter distances!
- Failure in planning and correct positioning of equipment – wasted foam (~240 litres/min.). This means that the whole effort may have to be conducted all over again.
- Successful fire (GESIP exercise vessel diam. 11 meters) ext. within 2,5 min.
- **Time distribution for successful extinguishing: 95 % planning and logistics - 5 % extinguishing effort!**



# General Experiences and Conclusions

- ❑ SMCs Extinguishing equipment is well adapted and dimensioned for depot fires (oil vessel fires)
- ❑ Tactics with "soft application on vessel top edge" is suitable for vessels of smaller size. SMC equipment is "over dimensioned" for smaller vessels (short time to extinguish fire)



# Experiences and conclusions, cont'd.

- ❑ Selection of suitable pump - and foam monitor position with ref. to wind and trajectory length is important



- Test with foam monitor:**
- **Strong effect from side wind!**
  - **Increased foam mixture induces *shorter trajectory distances !***



# Foam Monitors - experiences

Long "Aspirating" Foam Monitor pipe  
(Air inlet mixture) – Softer application.



Short "Foam Monitor" pipe (direct  
foam mixture in water) – More direct  
application.



# SMC-Exercises

- Involved:
  - Local Fire & Rescue Service
  - Oil Companies
  - Harbour (oil depots are often on harbour's premises)
  - SMC: s Co-ordinator
- Preparation and Planning + *Risk Assessment*
- Practical exercise (Equipment, Org., Procedures etc.)
- Collecting of experience, ("lessons learned")
- Agreement on mitigating measures
- Update of "Emergency Plans", Tactical Plans



# Risk Assessment *before* the Exercise

DOKUMENTMALL  
SMC AB / Per Brännström  
Dokument: Säkerhetsföreskrifter  
Utgåva / Datum: 1. 2010-04-14



Sida \_\_\_\_\_

SMC AB

Datum: \_\_\_\_\_  
Plats: \_\_\_\_\_  
Företag: \_\_\_\_\_  
Depå etc.: \_\_\_\_\_

Deltagare: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## RISKANALYS: RISKGENOMGÅNG MED ÅTGÄRDSPROGRAM

Här nedan följer en lista på de arbetsmoment där särskild hänsyn skall tas för att undvika skador på människor eller egendom

| ARBETSMOMENT - RISK   | SANNOLIKHET |       |      | KONSEKVENSN |       |      | TYP AV SKADA   | ÅTGÄRD  | ANSVAR   |
|---|-------------|-------|------|-------------|-------|------|--|---|--|
|   | liten       | medel | stor | liten       | medel | stor |  |   |  |
| <b>Förberedelsearbeten:</b><br>Kontroll av uppställningsplats SMC utrustning. Hinder eller inhägnader mot tredje part /företag/ vid användning?   | X           |       |      | X           |       |      | Vid hinder av uppställning kan intilliggande tunga fordon inte komma in. Ev. påverkan på annans egendom. | Kontakta markägare. Samråd med depåchef.<br>Vid behov flytta ev. fysiska hinder. Samråd med berörda ägare samt depåchef.<br>Ev. överväg ställa SMC utrustning på alternativ uppställningsplats.   | Koordinator (namn)   |
| Samtidigt pågående byggnads- och underhållsarbeten på intilliggande cistern där SMC övnings skall utföras.<br><br>Finns tung Trafik nära cistern?<br>Finns lyftkranar uppställda?<br>Skydda SMC brandslangar? |             | X     |      |             |       | X    | Risk för personskada (halkrisk, byggnadsställning)   | Kontakta samordningsansvarig för Arbetsmiljöfrågor (BAS-P, Bas-U) samt ansvarig arbetsledare.<br>Kontakta depåchef och ev. projektledare för beslut och åtgärd. Dokumentera åtgärd.<br><br>Avspärrningar. Ev. lyftledare/signalman.<br><br>Ordna "Bryggor" över brandslangar? | Koordinator (namn)<br>Ansvarig Arbetsledare (namn)<br>Bas-P (namn)<br>Bas-U(namn)<br>Proj.led (namn)<br><br>Depåansvarig / SMC koordinator |
| Kontroll av cistern med omgivning (invallning etc.).<br>Avrinning?<br>Igensatta dräneringsbrunnar?  |             | X     |      |             |       | X    | Risk för Cisternlyft vid stora vattenmassor som fylls på.  | Säkra att avrinning fungerar. Kontrollera var vattnet leds (ev. underminering).   | Koordinator (namn)   |



# Logistics SMC Equipment





# Logistics SMC Equipment



# SMC Exercise in with Swedish Air Force



# Close Up: Loading operation on C-130 Hercules Aircraft



# Equipment Assembly



A large-scale exercise includes several parts such as transportation, to set out pumps and fire hose and foam proportioning units.



Two SMC modules.



# SMC – Called in several times

- Kälarne – June 1997
- Tyresta – July 1999
- Venezuela – Feb/May-00
- Bergs Oil depot April -00
- Borlänge – April - 00
- Ånge – July - 00
- Piteå – Nov - 00
- Malmö - Sept - 01
- Perstorp – July - 01
- Landskrona – July -01
- Dals Långed – Oct -02
- Ballingslöv – Dec -03
- Värnamo – July -04
- Härnösand - Sept - 04
- Helsingborg – Feb -05
- Karlstad – Oct. - 06
- Västerås – March - 07
- Karlstad – October-08
- **Mönsterås – Aug. 2011**
- **Nynas Refinery- Oct. 2011**
- **Halmstad Sept. 2012**
- **Malmö Oil depot June 2013**
- **Västmanland Forrest Fire Aug. 2014**



Thank you!  
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