Generalitat de Catalunya
Departament d'Interior

protecció civil

IQOXE accident (2020 - ES) recommendations for the future

IQOXE accident (2020 - ES)

Seveso facilities

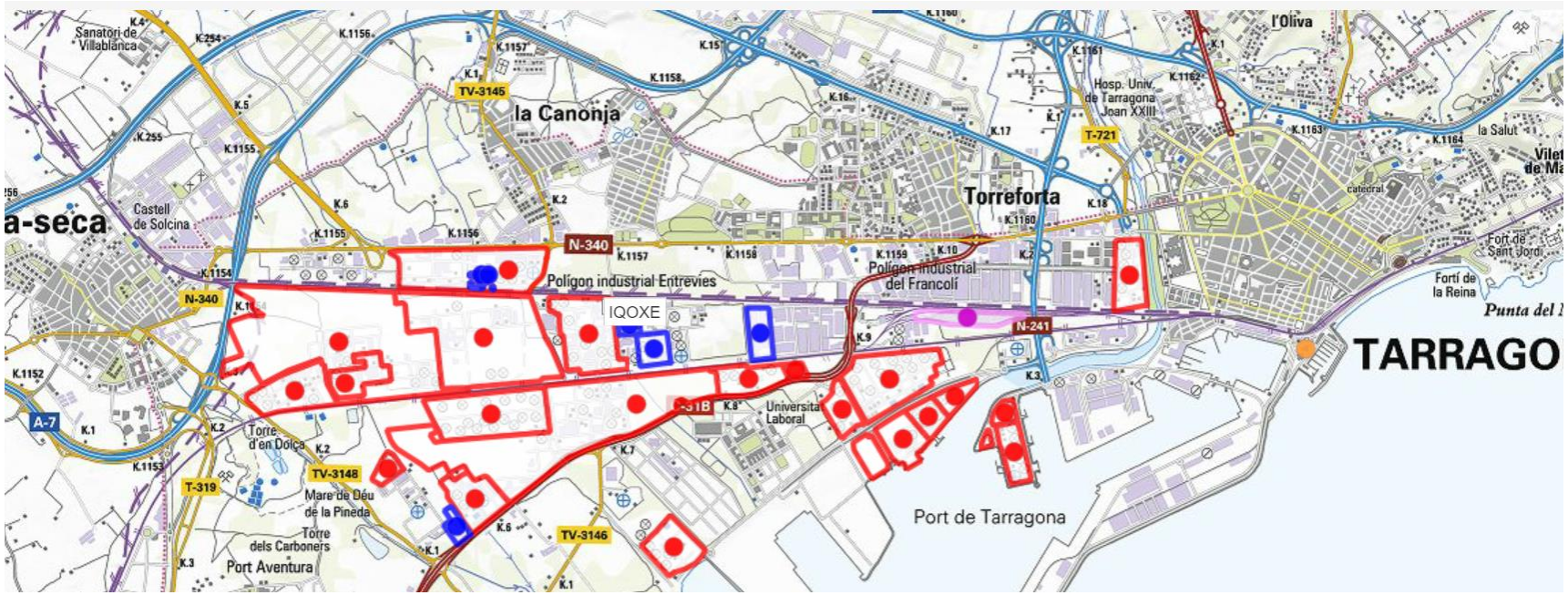
- Catalonia: 160 Seveso facilities
  - 93 high threshold
  - 67 low threshold

- Tarragona petrochemical area: 39 Seveso facilities (24% CAT)
  - 29 high threshold (23 south area)
  - 10 low threshold (8 south area)

Other facilities in the emergency plan: 8

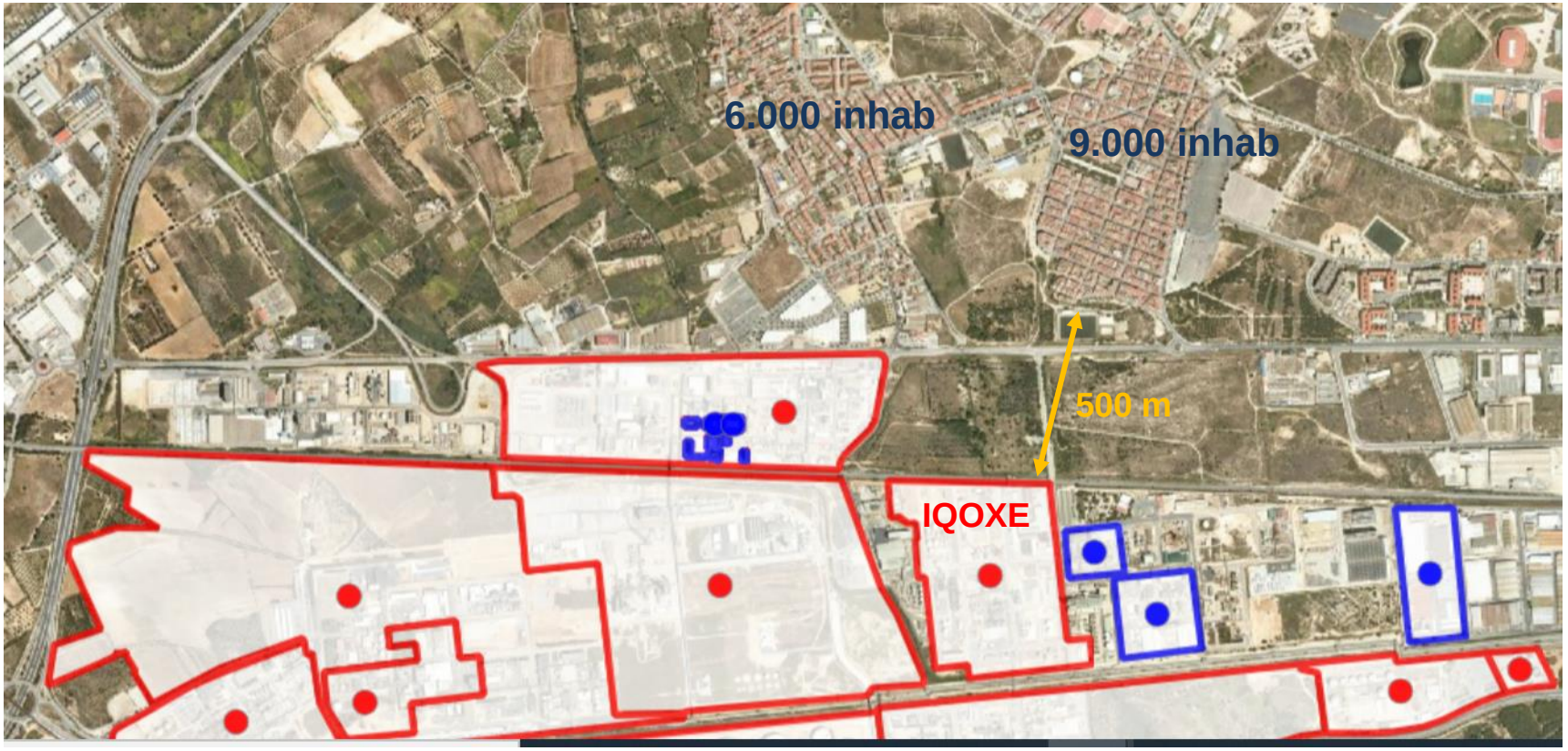
IQOXE accident (2020 - ES)

Tarragona petrochemical area

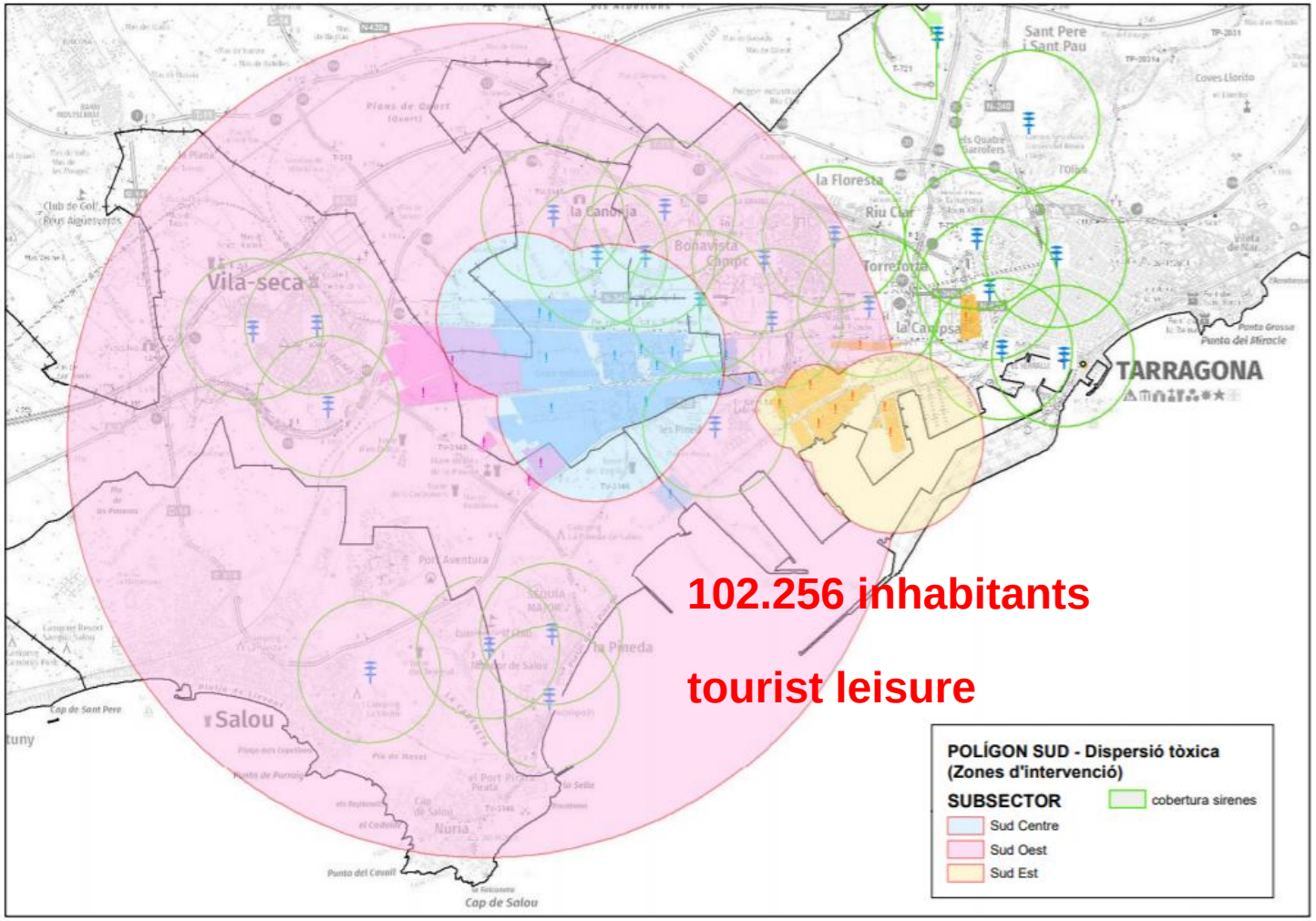


IQOXE accident (2020 - ES)

Tarragona petrochemical area



Tarragona petrochemical area



IQOXE accident (2020 - ES)

IQOXE

- Dangerous substances
  - Ethylene oxide 1550 Tn
  - Propylene oxide 1450 Tn

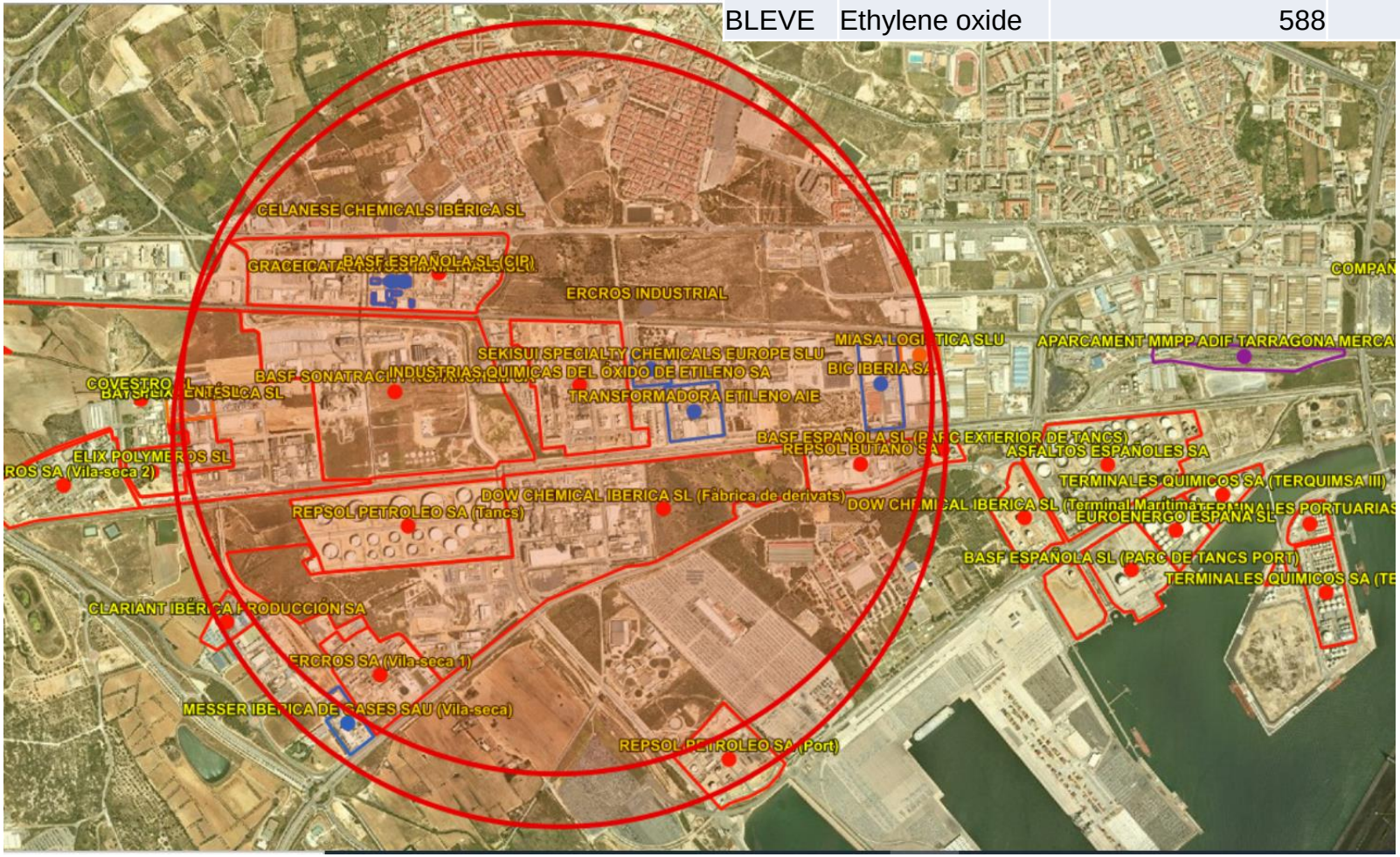
Image from www.iqoxe.com

- Activity
  - Ethylene oxide production
  - Ethylene oxide and propylene oxide derivatives

IQOXE accident (2020 - ES)

IQOXE

		Sheltering area (m)	Alert area (m)
Toxic	Ethylene oxide	1.614	8.733
BLEVE	Ethylene oxide	588	789



IQOXE accident (2020 - ES)

IQOXE accident: January 14th 2020

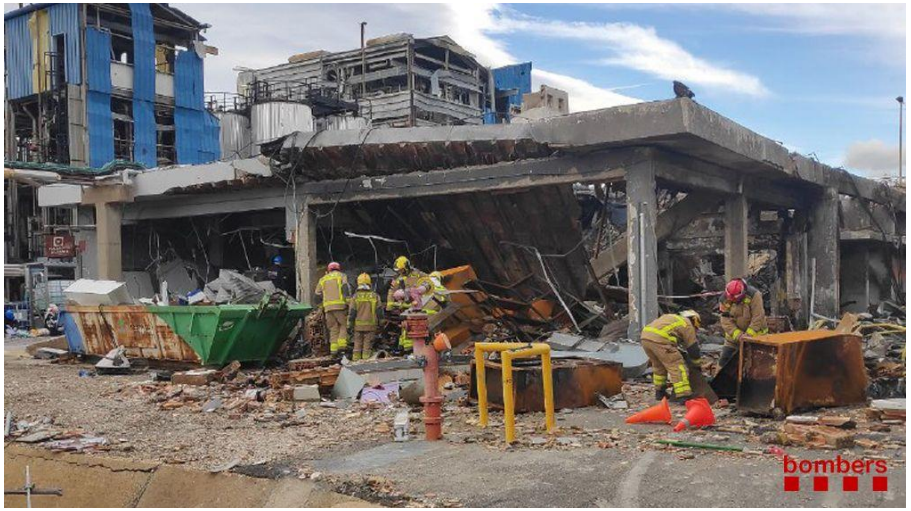
- Units - substances
  - Explosion in a reactor: ethylene oxide (4 Tn) polymerization (20 Tn)

    Area totally destroyed. Debris – shrapnel all around (outside plant)
  - Fire in a tank (domino effect) : propylene oxide (263 m3)
- 3 deaths:
  - 2 workers
  - 1 neighbour (inside building – home 2,5 km far away)

IQOXE accident (2020 - ES)

IQOXE accident (2020 - ES)

IQOXE accident (2020 - ES)



IQOXE accident (2020 - ES)

IQOXE accident (2020 - ES)

Image from www.telecinco.es

IQOXE accident (2020 - ES)

Difficulties in the response

- Identification / notification of accident
  - Problems
    - No installation notification
    - Proximity of several facilities
    - No contribution from other facilities
  - Consequences
    - No able to identify facility affected (due to detect trough our petrochemical video network)
    - No able to define scenario –> no able to define effects / impact
    - **Late response**

IQOXE accident (2020 - ES)

Difficulties in the response

- Identification of possible consequences / impact
  - Problems
    - Scenario not include in analysis (but similar)
    - No fragment projection references (not included in ES analysis)
    - Proximity of citizens (neighbourhoods, sports areas, …)
  - Consequences
    - Difficulties to connect impact 2,5 km far away (1 death) and fragments all around. Miss understanding scenario
    - **Potential dramatically higher effects (vulnerable < 500 m)**

IQOXE accident (2020 - ES)

Difficulties in the response

- Sheltering – warnings sirens
  - Actions – decisions
    - No toxic scenario (ethylene oxide burned – polymerized)
    - No activation of warnings sirens
    - Recommend to stay inside for areas affected by smoke and vulnerable
  - Consequences
    - Local authorities claim sheltering
    - Activation and reverse decisions
    - **Citizens assumed no control of the emergency (no risk control)**

IQOXE accident (2020 - ES)

Recommendations for the future: response

- Preventive strategy
  - Sheltering for explosion scenarios (not just toxic clouds)
  - Sheltering automatically from the beginning in potential major accidents

    Warning sirens activation

- Improve anticipation
  - No dependence from the installations (failure scenarios)
  - Chemical sensor networks in the industrial – urban interface

IQOXE accident (2020 - ES)

Recommendations for the future: prevention

- Risk Analysis: include
  - Fragment projection
  - Low probability scenarios / high impact
- Prevention – urban control
  - Security area for chemical areas (UE standard; minimum value; 500 m is not enough for protection against extreme scenarios)
  - No vicinity with vulnerable activities (schools)
- Trustful information
  - Accidents may occur. Safety is never total