



**Zakopane, Poland October 9<sup>th</sup>-12<sup>th</sup>, 2019**



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**(Hrvatska gorska služba spasavanja & Corpo nazionale soccorso alpine e speleologico)**





2 interest for collaboration  
Canada and Iran

# Constitution

- **NAME / INCORPORATION**

- The **European Cave Rescue Association (“ECRA”)** is a **not for profit association of national cave rescue organizations** and similar rescue organizations that are based in the continent of Europe.
- The ECRA is to be neutral in matters of religious and political belief and practices, but may seek to persuade government organisations and others to adopt policies and laws supportive of cave rescue.
- The ECRA is incorporated as an association under Croatian law with its seat in Croatia. Its postal address shall be 10000 Zagreb, Croatia, 22 Kozarceva Street, or such other address as the General Assembly shall from time to time approve. In the event of a dispute, the Court of jurisdiction is the Court of Arbitration in Sport, Lausanne.

- **PURPOSE AND GOAL**

- ECRA exists for the following purposes:

- **to promote the exchange of knowledge and experience in the field of cave rescuing,**
- to facilitate cooperation and support between members,
- to advance and improve cave rescue knowledge and the capabilities of member organizations,
- to provide information and statistics on cave rescue incidents,
- to exchange knowledge and experience of best practice in cave rescue between cave rescue organizations, caving organizations, manufacturers of caving equipment and other interested bodies,
- to conduct research with a view to improving the efficiency and effectiveness of cave rescue,
- to conduct such ancillary activity as the ECRA shall think appropriate to better achieve these purposes.

# Roof international „cave rescue associations”



- UIS - Union Internationale de Spéléologie  
(International Union of Speleology)

Department of Exploration

- ▶ Cave Rescue Commission – president  
**Christian DODELIN - SSF**
- ▶ Materials and Techniques Commission – president  
Monica PONCE - Mexico
- ▶ Cave Diving Commission – president Maxime de  
GIANPIETRO - Suisse

**-only national caving fedartions can be members**

# ICAR-CISA



**Alpine Medicine**



**Air Rescue**



**Avalanche Rescue**



**Terrestrial Rescue**

**-no cave rescue commission**

**-most of mountain rescue is not with cave rescue**

# FSE

## European caving federation



**Speleo-rescue commission**

**-chairman – Antonya Vlaykova**

**-only national caving federations can be members**

**We needed cave rescue organization for all!**

# THE BEGINNING OF ECRA: MEETING IN BERCHTESGADEN 2007



Alpin carst cave rescue meeting  
2009, Treviso , Italy



2010, Saalfelden, Austria



2011, Paklenica, Croatia

# Founding Assembly: Castelnuovo Garfaghana, Italy, 12<sup>th</sup> May 2012



4<sup>th</sup> April 2012, Brescia, Italy  
- drafting constitution



2012, 1<sup>st</sup> ECRA board



2012, Jura, France  
-The 1<sup>st</sup> Annual GA



2014, Trieste, Italy



2015, Mesceck Haza, Hungary



2016, Malačka, Croatia



2017, Sofija, Bulgaria

# Cave rescue in Riesending



# Thai cave rescue by



# British Cave Rescue Council

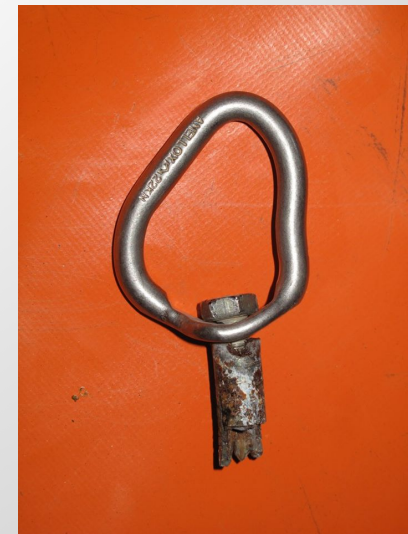


# Technical commission

chairman: Giuseppe Conti, Corpo nazionale soccorso alpino e speleologico

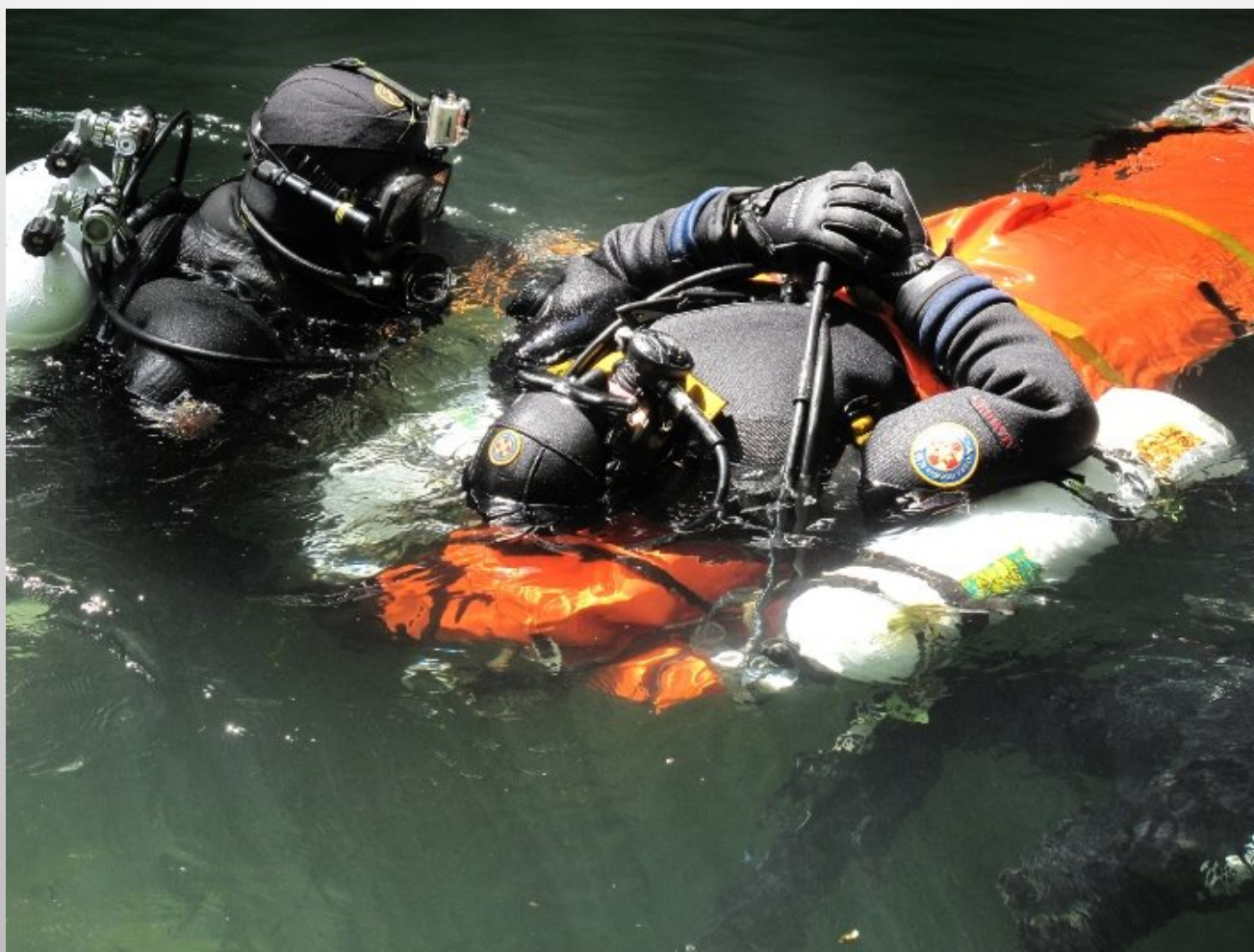


**Tests  
-report**




# Cave diving commission

Chairman: Robert Anžič, Jamarska reševalna služba



**Joint exercises**

# Medical commission:

chairman: dr.Lana Djonlagić,   
Hrvatska gorska služba spašavanja

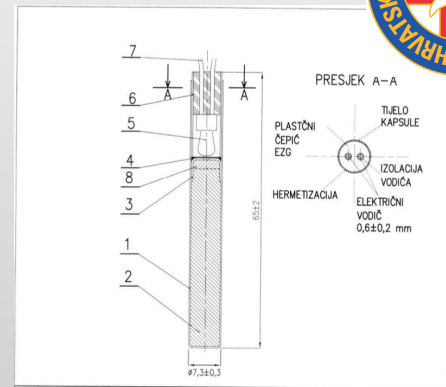
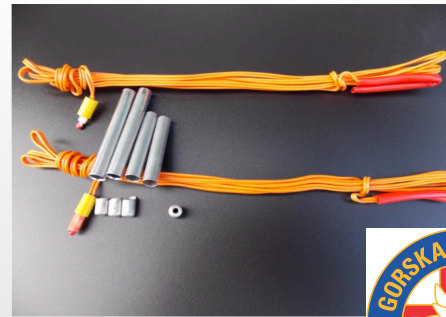
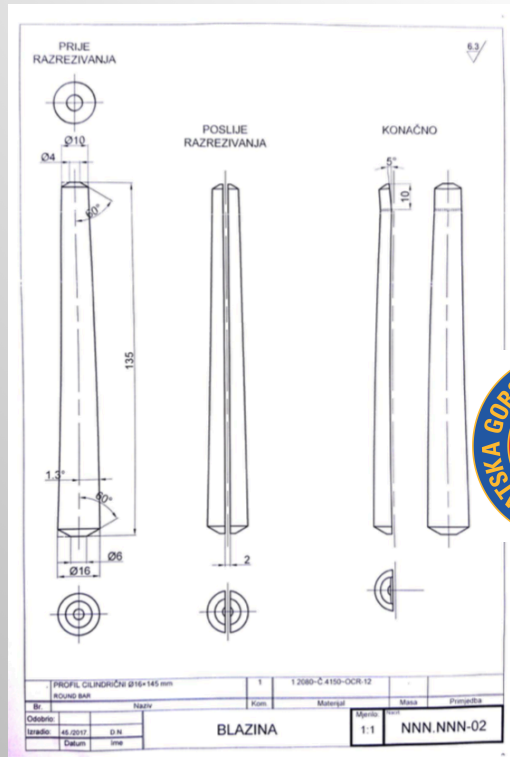


**Booklet with conclusions**



# Passage enlargement commission

chairman: Werner Zagler, Bergwacht Bayern



Blasting tools



Non-Blasting tools

Ventilation during  
blasting



# International network group?

## International cave rescue association?



- ECRA is not anymore European association!

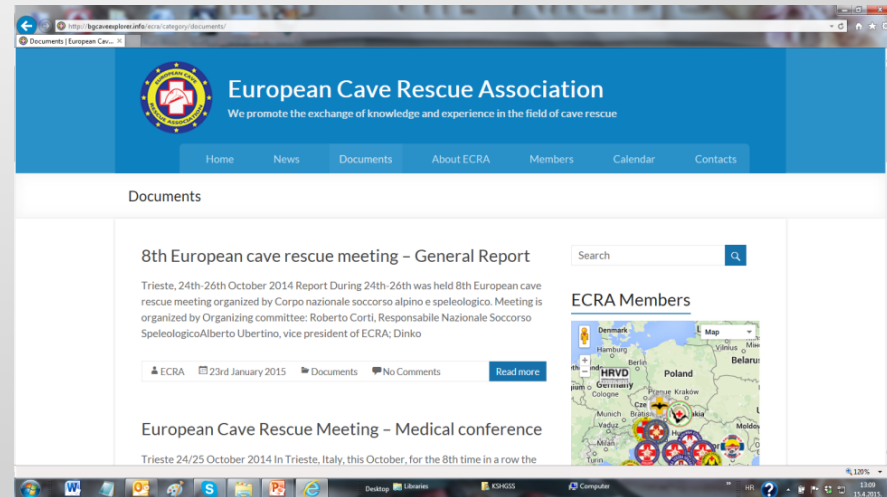
# Working groups: Informing

Facebook

[/ECRA.rescue/](https://www.facebook.com/ECRA.rescue/)

Web

<https://caverescue.eu>



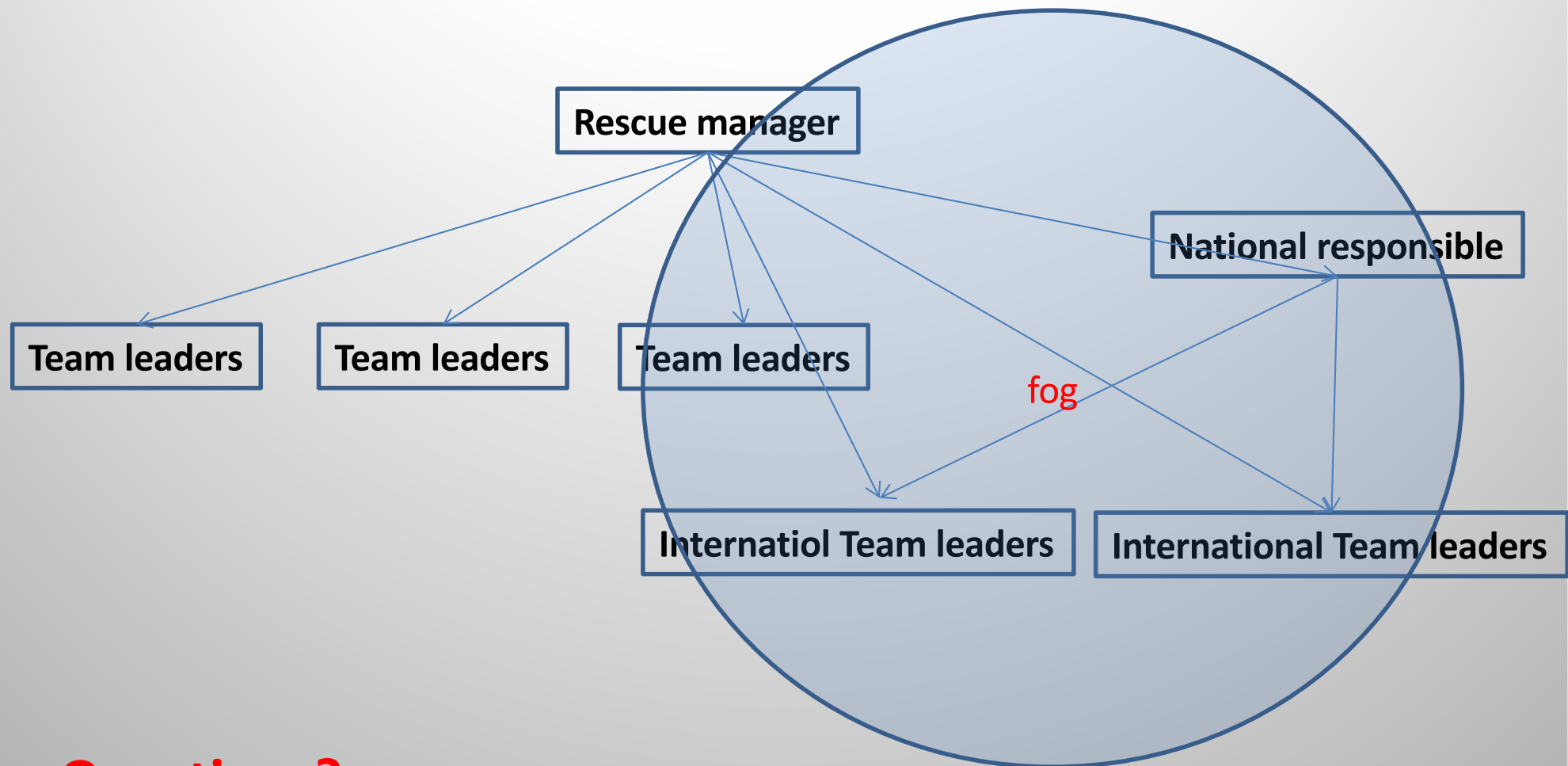
# ECRA is not regulative body!

- ECRA do not make SOPs, rules, issue recommendations...
- Each service has full autonomy
- ECRA just offer solutions

In 2019y ECRA became UIS cooperating organisation



# International rescue operation



**Questions?**

**How to manage international cave rescue operation?**

Questions?

How to be part of EU civil security system?



## Emergency Response Coordination Centre (ERCC)



# Questions?

## How to improve internal organisational level ?

### Enabling Phase

Management Units

National Association

Province Associations

CR DB

Operational Units

Rescue Stations

### Operation Phase

Emergency task force (authority ... federal president)

Cave Rescue

Head Of Operations (Team)

Vanguard

Recover Leader

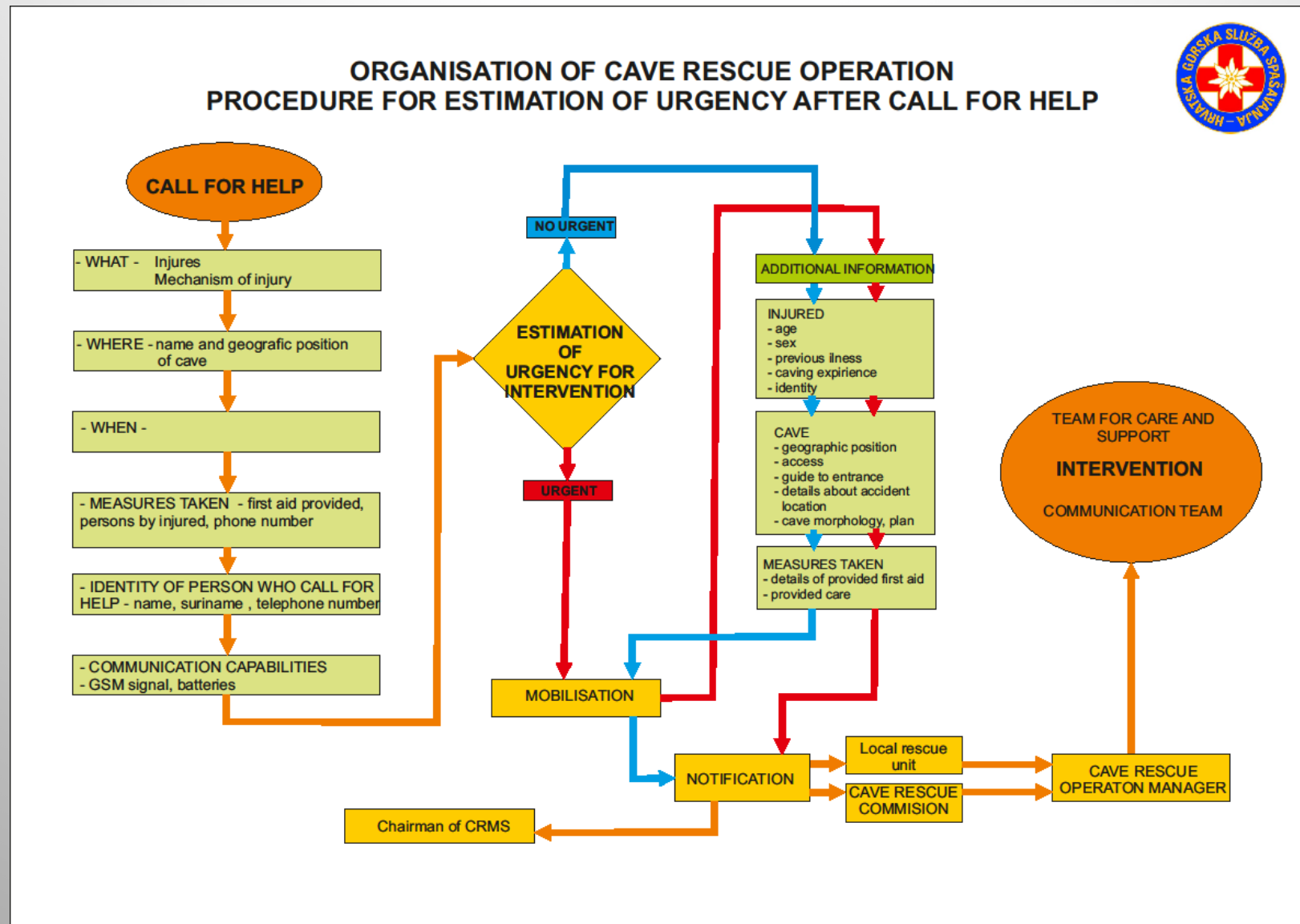
Recover Troups

Material officer, ...

Other emergency organizations

# Questions?

## How to improve internal operational response?



# **SPELEO TRAUMA CARE**

## *Health Care Training*



**Speleo Trauma Care** (STC) training course is based on international guidelines (PHTC, BTLS)

developed  
for first-responder  
rescuers  
in caving rescue operation



**Questions?**  
**How to improve medical support?**

# Questions?

## How to set bivouac for patient?



Type	Steinberg			Vatino bivak			Imporvised		
Mesuring	I	II	III	I	II	III	I	II	III
Time to set bivouac	10	11	8	14	19	14	24	13	18
Time until victime reach bivouc	12	18	14	17	23	19	30	18	20
Temperature in bivouc after 15 min (°C)	19°	23°	29°	21°	27°	23°	24°	25°	24°

# Questions?

## How to set bivouac in specific conditions?



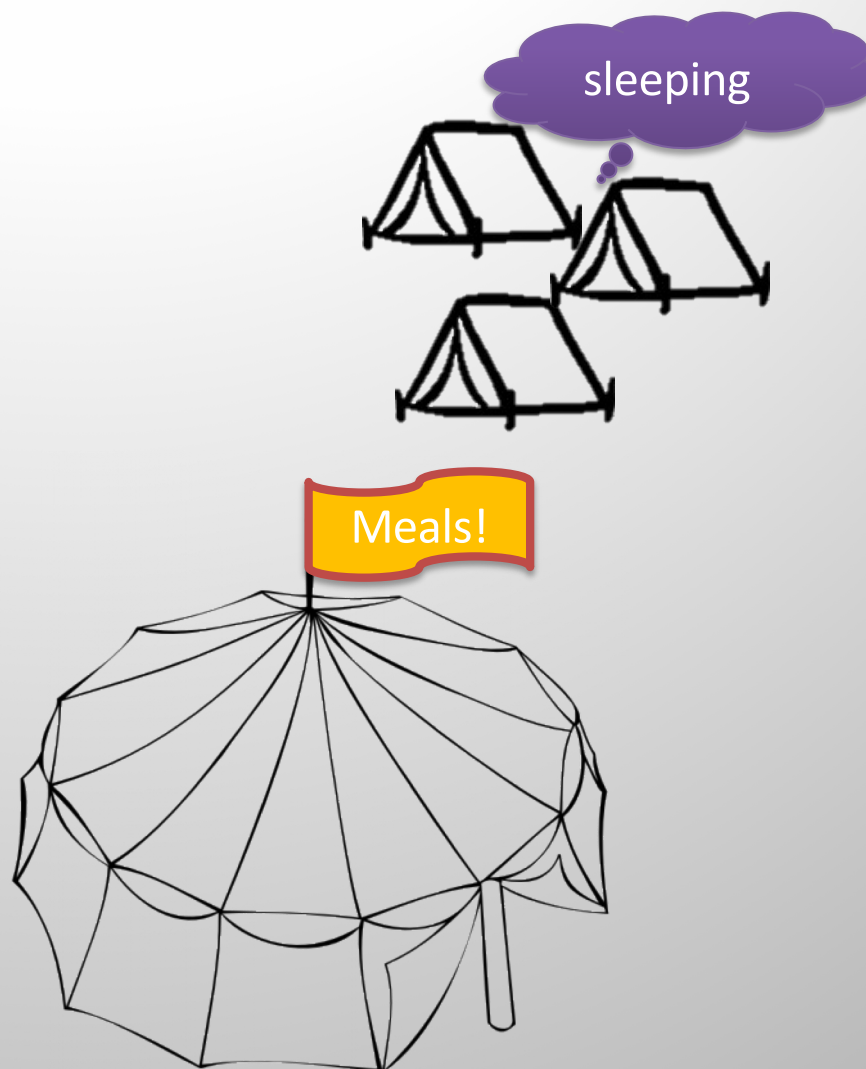
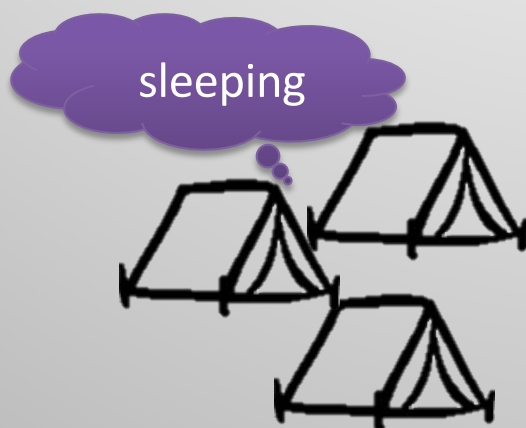
# Questions?

## Hostels for rescuers?



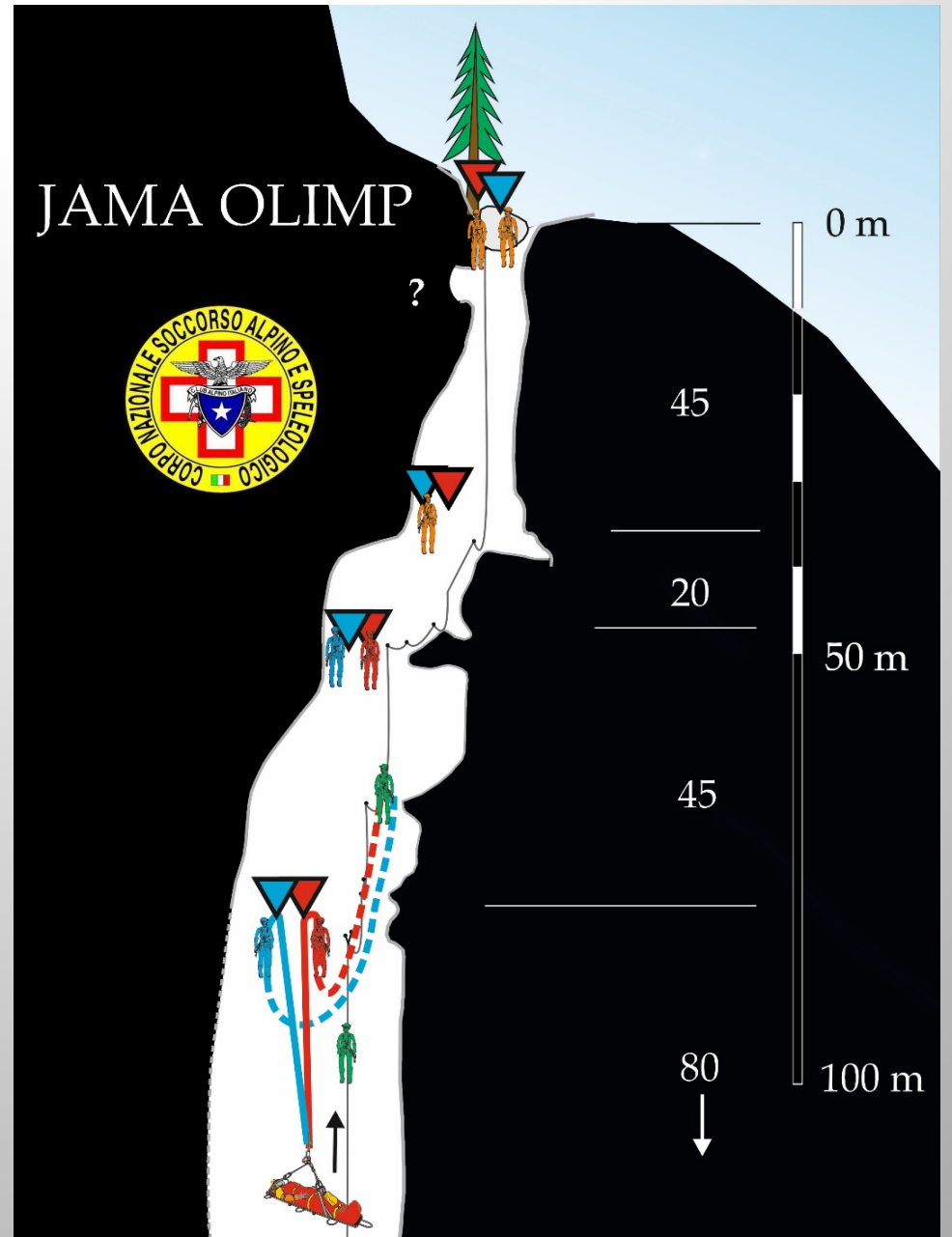
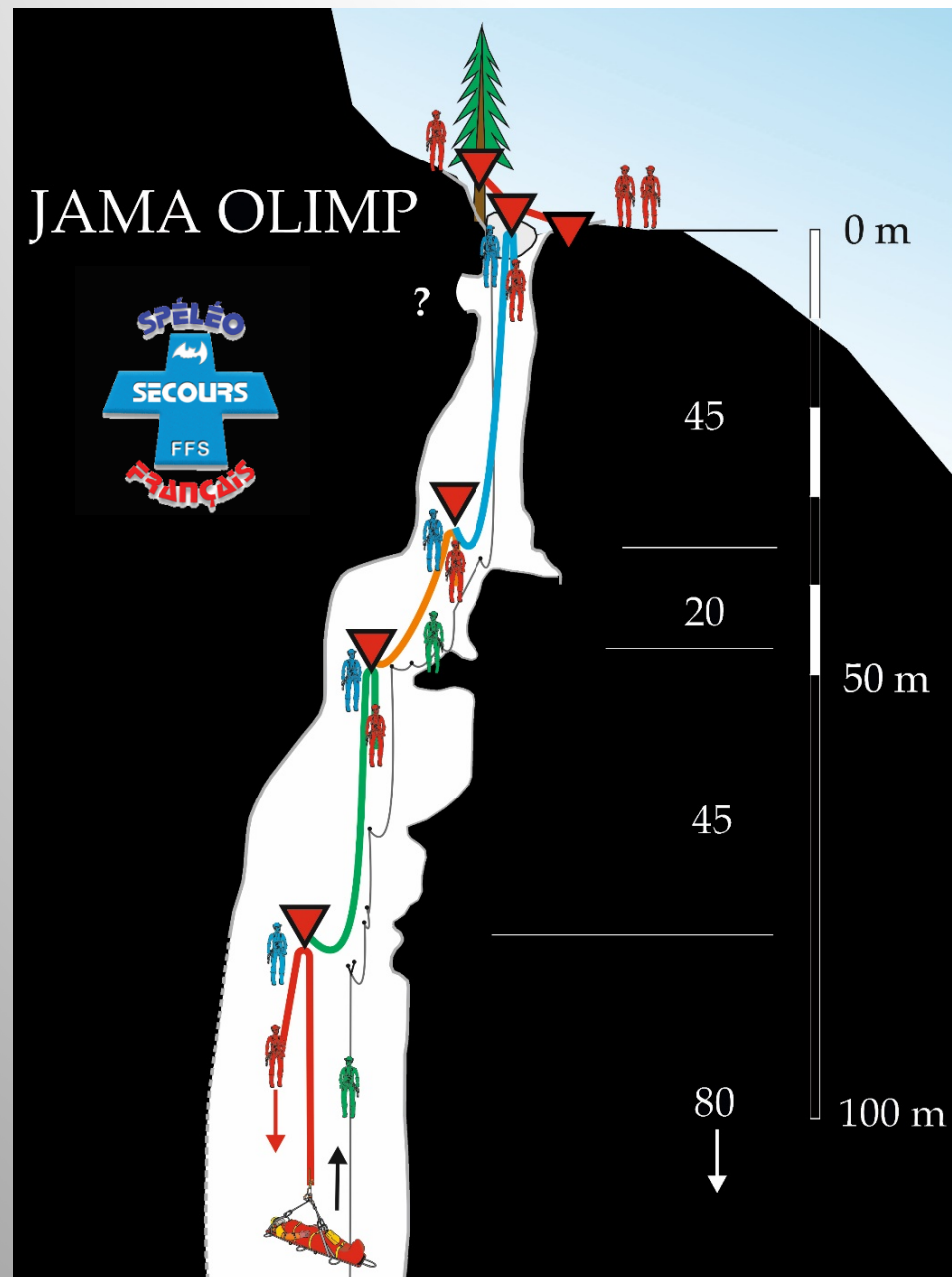
Two functional zones:

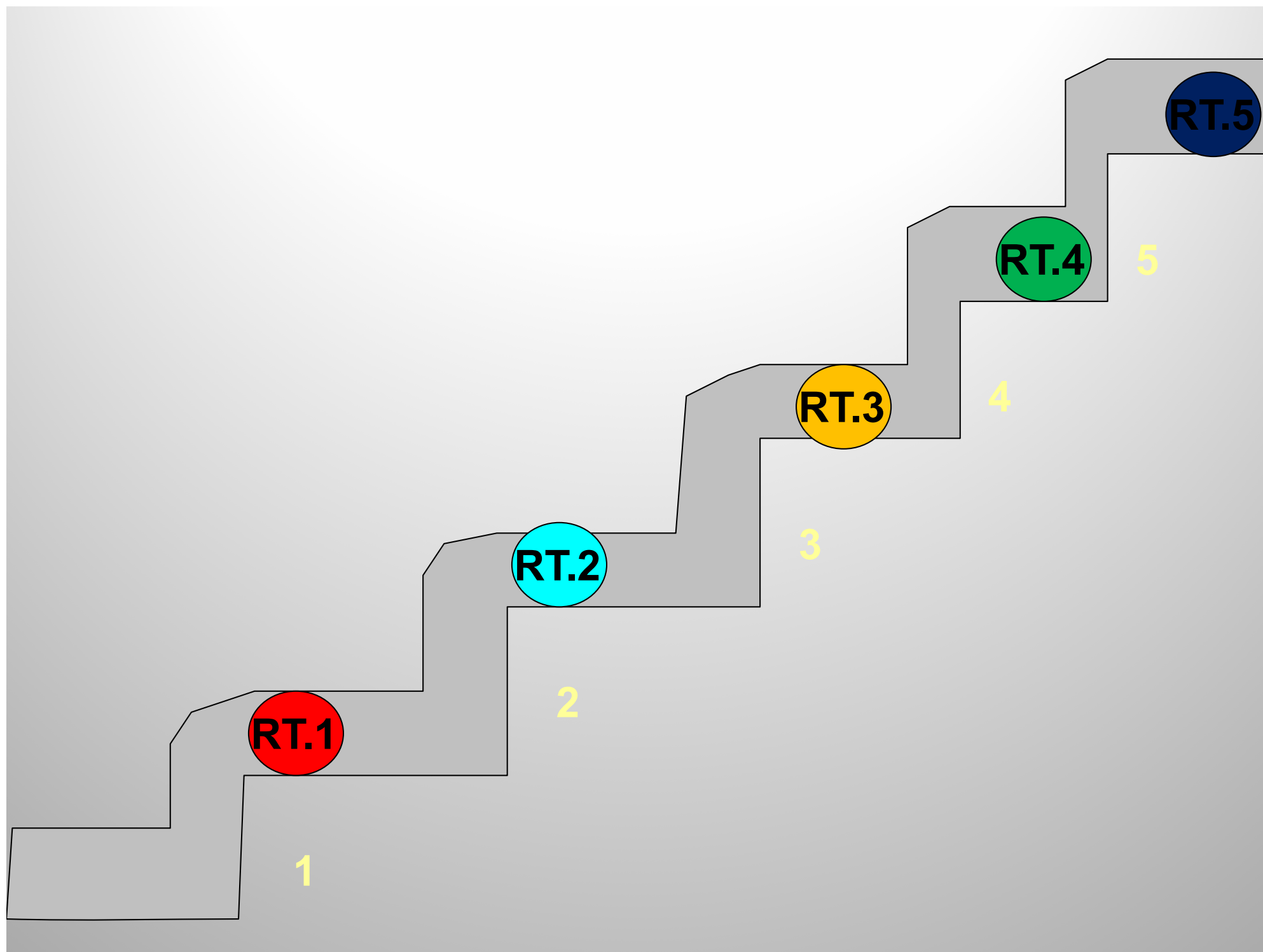
- ✓ sleeping zone
- ✓ dining area

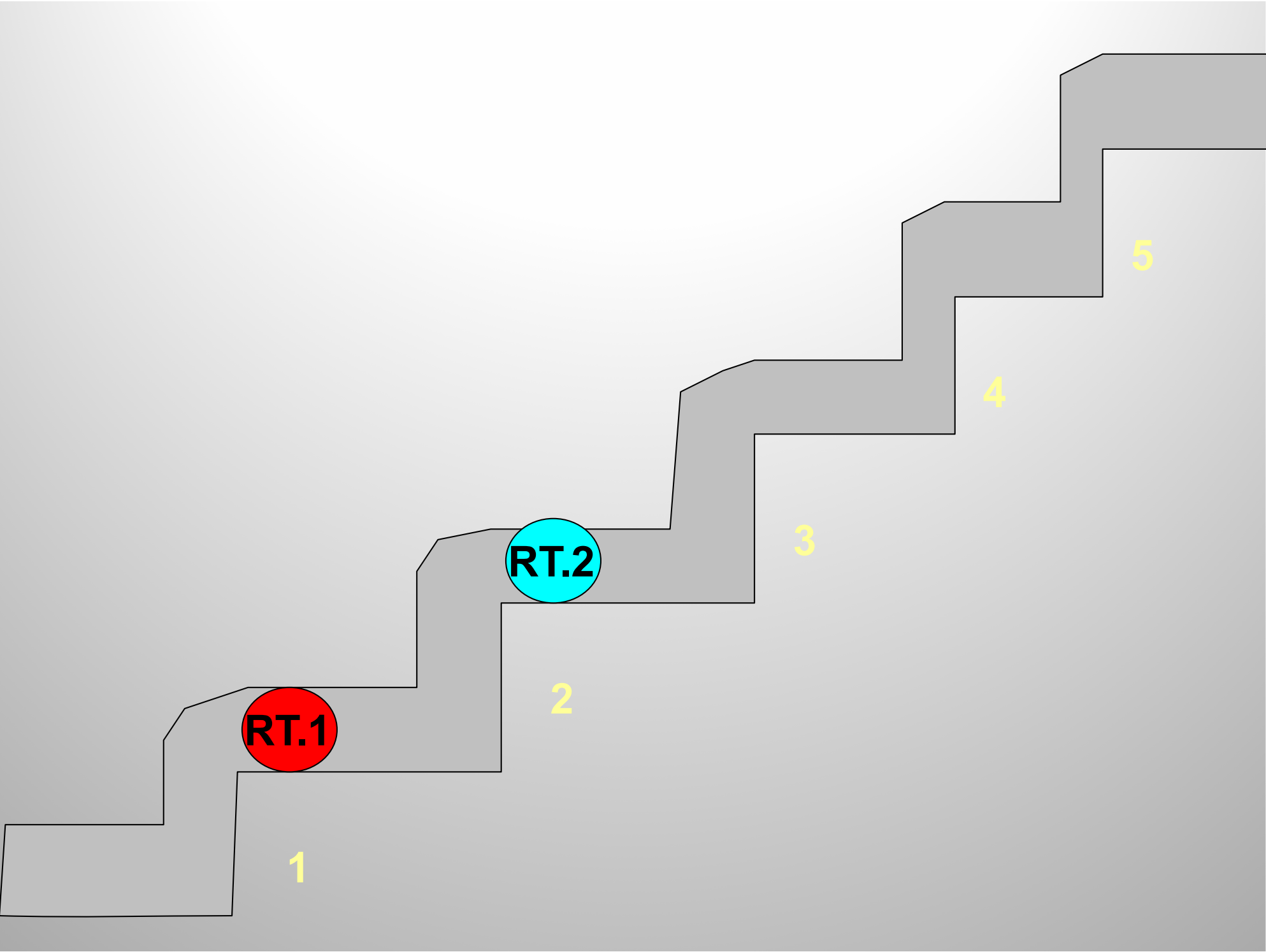


# Questions?

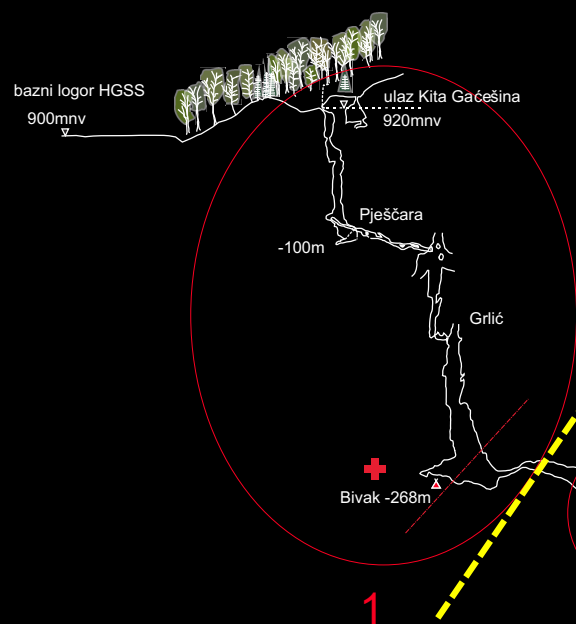
## How to organise optimal team flow?







## Focused teams (E3-E12 – 36 rescuer)



## Self efficient teams (E1-E2 – 22 rescuers)

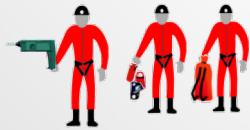


## Small party assisted rescue (3 rescuers were in cave)



# Questions?

## Team composition?



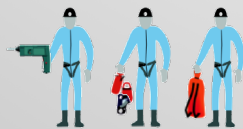
1ST RIGGING TEAM



COMMUNICATIONS



TEAM LEADER



2ND RIGGING TEAM



STRACHER TEAM



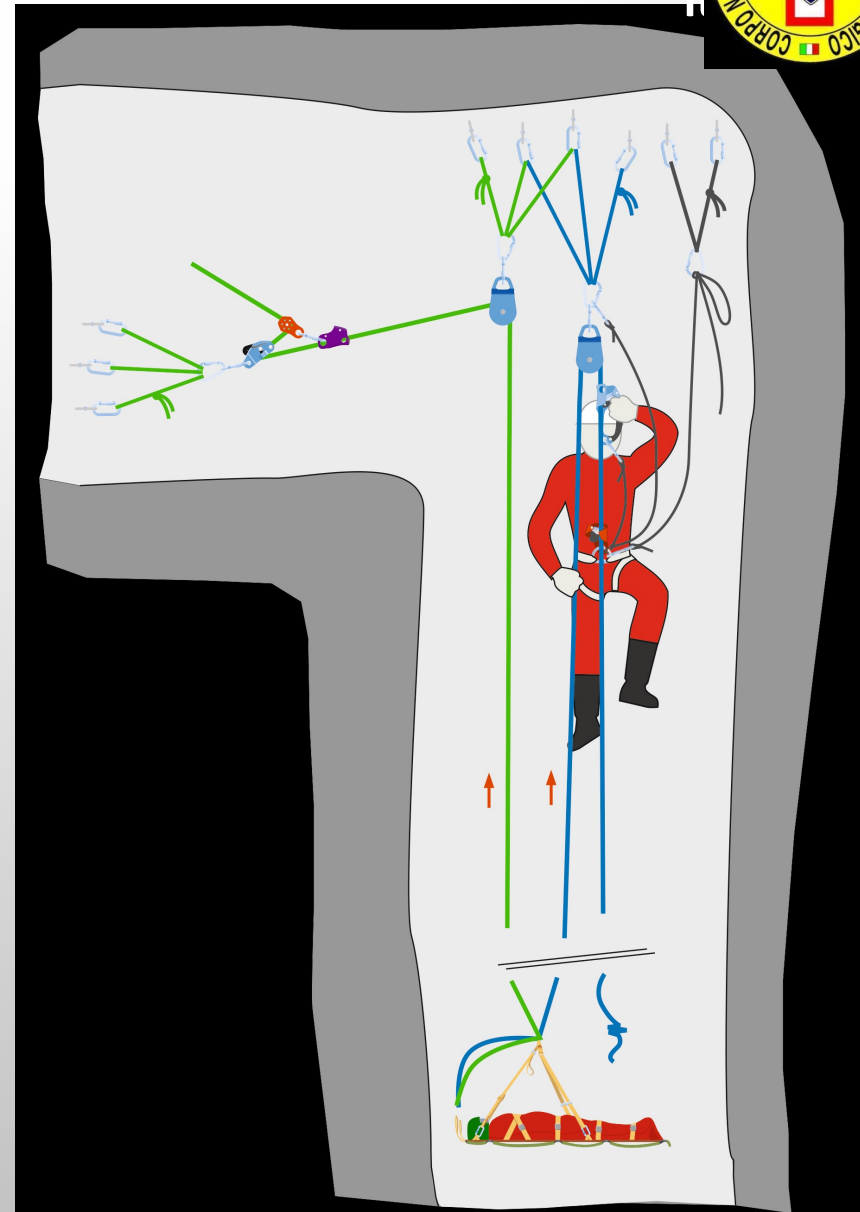
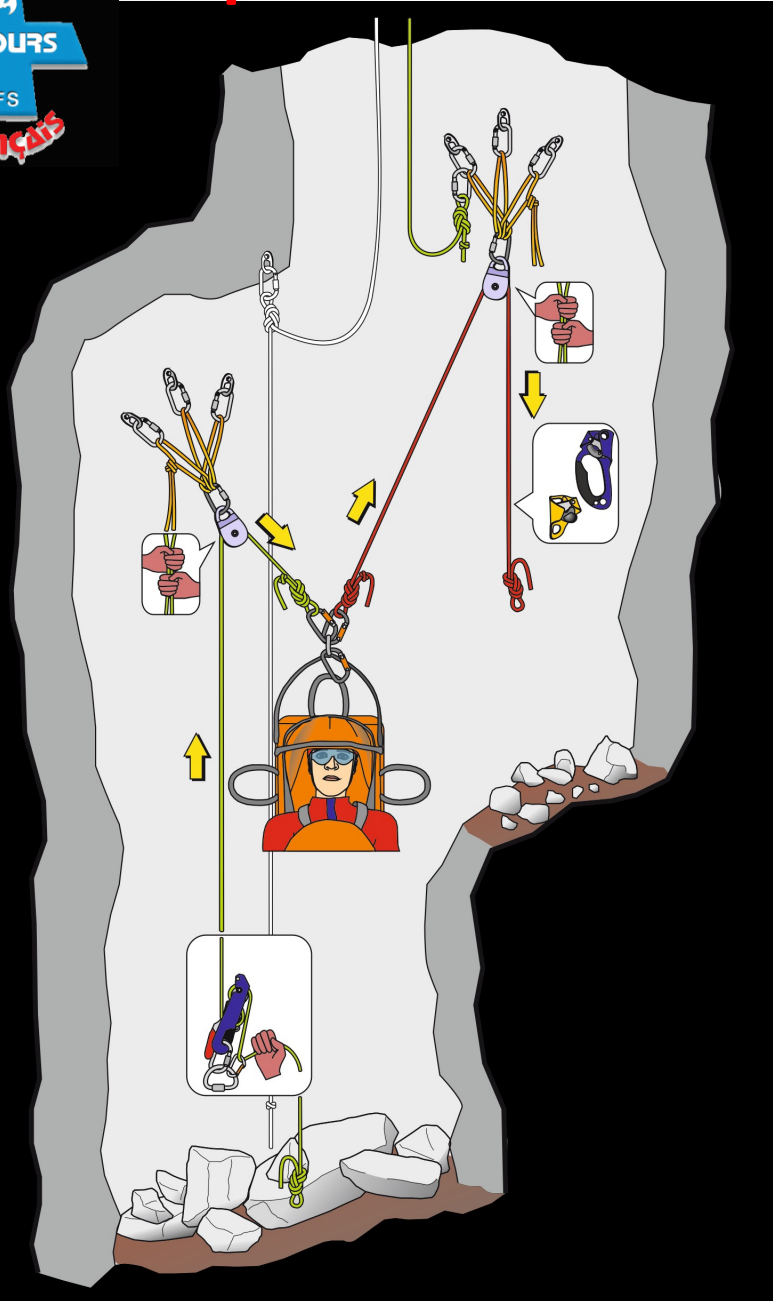
HAUL LINE



BACK-UP LINE

# Questions?

## Optimal maneuverers?



# Questions?

## What is ideal stretchers for cave rescue?



stretchers



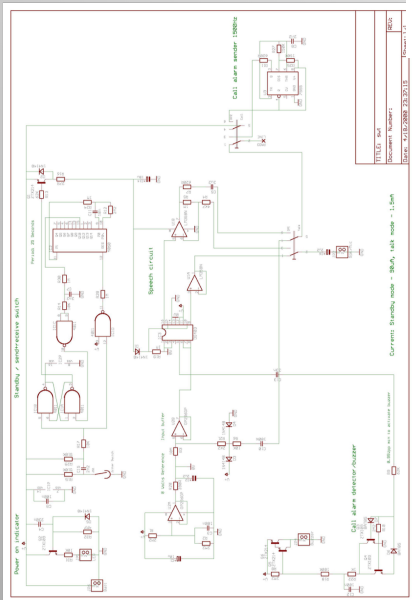
# Questions?

## How to establish efficient communication?

### Wire systems



### Speleophone



### Wireless systems

#### Nicola II -voice (analogue)



#### Cave-link -short-messages



#### Nicola III -voice (digital)



## How to establish data transmission?



# ERMES SYSTEM ARCHITECTURE

## Questions?

**Compromise between efficiency, legal regulation and toxic gas products?**



**Explosive – fuel + oxygen carrier + stabilizer**

**Speed of burning – 2000-5000 m/s – explosive - pyrotechnic**

**We do not want Sulphur, Nitrogen or Carbon burning**

**Close safety distance 3m**



# Blasting



# Questions? How to handle bad air?



**Montérolier, France. 21st  
June 1995**

**9 died – 3 children, 1  
parent.**

**And 5 rescuers.**



Trois adolescents et six adultes, parmi lesquels des sapeurs-pompiers ont trouvé la mort dans la grotte de Montérolier le 21 juin 1995 (Midi 11).

Questions?

Bad air - concentrations?



## Carbon Dioxide

- Different people can react in different manners to exposure above about 3%
  - ❖ 'Red puffers' will go red in the face but cope relatively well
  - ❖ whilst the more rare 'blue bloaters' may well collapse in lower concentrations.
- On a rescue we need to keep the level as low as possible below 1% and no higher than 2%



# Questions?

Cave diving equipment for patient?

Floating balance of stretchers, how improvise?

How to train cave divers for rescue missions?



- Statistics:
- each 17<sup>th</sup> cave diving— incident
- each 620<sup>th</sup> cave diving – mortal till 1978 – (0,16%)
- each 3286<sup>th</sup> cave diving – mortal – recent data (0,03%)

# Questions?

**13<sup>th</sup> European Cave Rescue Meeting**

**2019**

14-17 November  
Istanbul, Turkey

**Welcome!!**

