Experiences from exogenous fire incident rescue operations at 1C coal-seams - Trangbach East area of Dongvong Coal Mine Company in Vietnam

Main contents

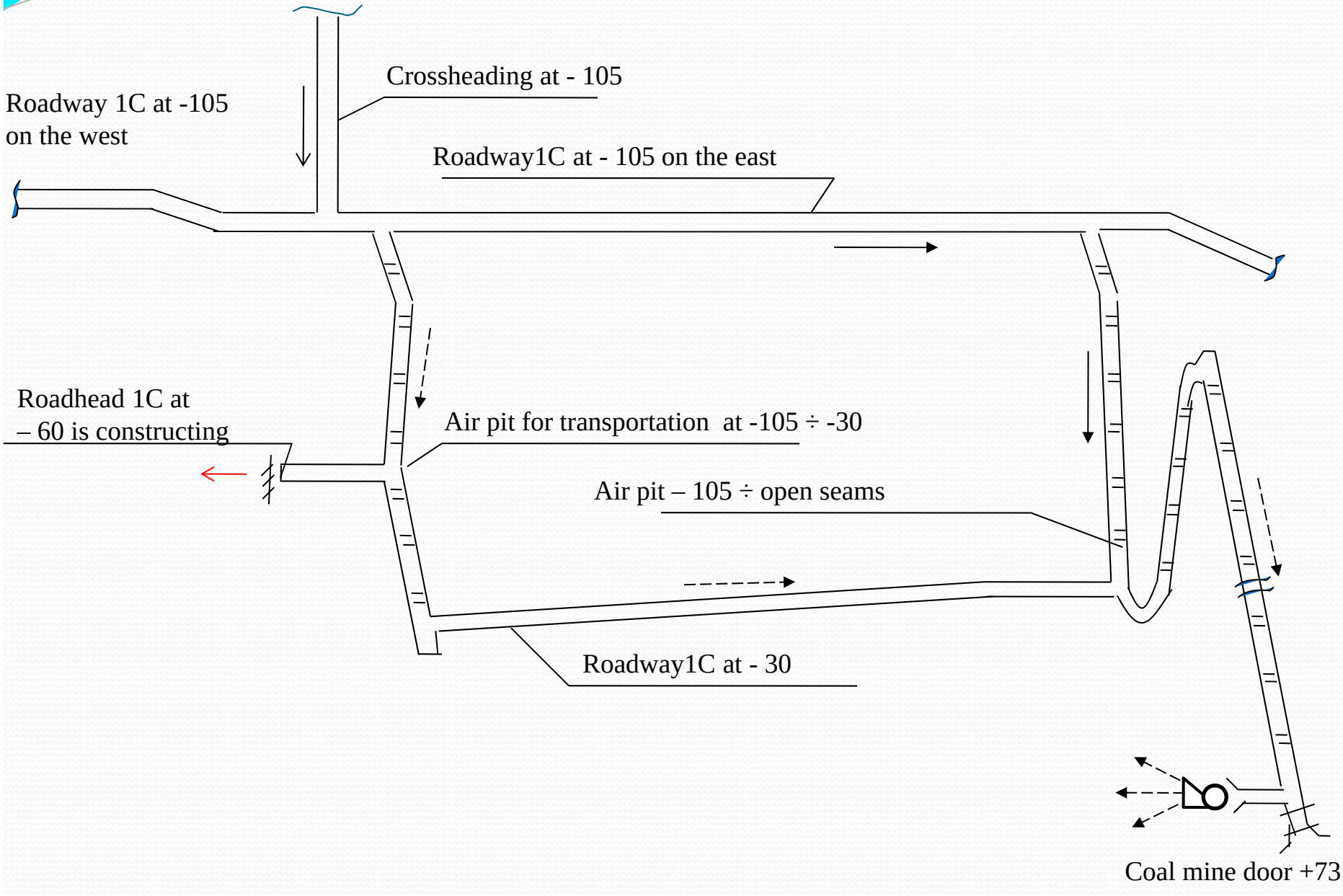
- *Description*
- *Progress of the incident*
- *Solution methods*
- *Comments*
- *Experiences*

Description of the incident area

East Trang Bach 1C coal-seam has been put into operation in Dong Vong Coal Mine Company since 2007. From the position (sea-level) ±0 and above, coals have been fully exploited. Up to January 2014, the company has cleared to the level - 105 and has been zoning an area for exploitation from lever -105 to -30. The protection pillar for exploited floor is 30 height.

At the time of Jan 15th 2014, the company has been digging the stratified face at the level -60 in order to divide working face to two stratified faces.

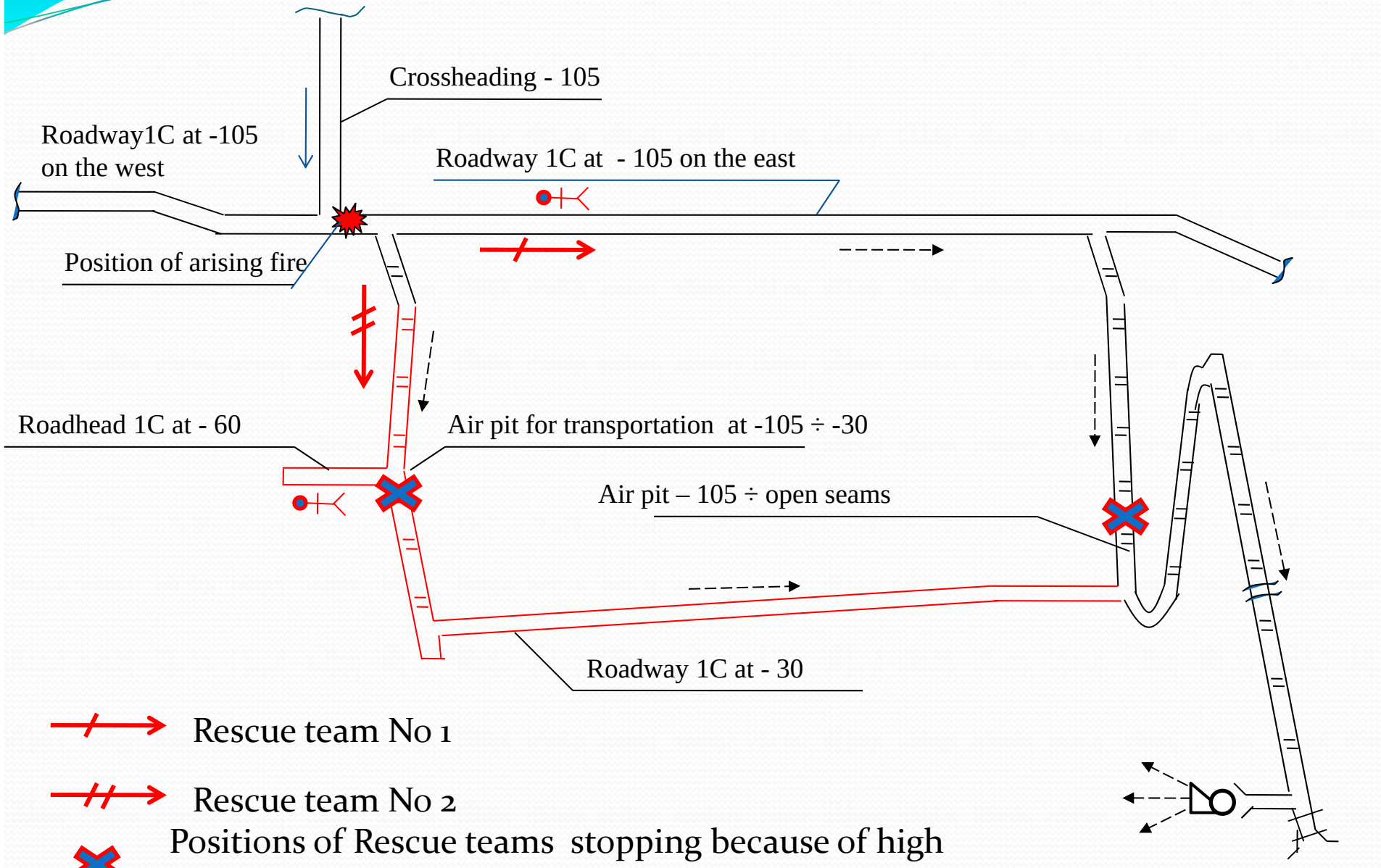
Map of incident area



Progress of the incident

At the beginning of the third shift on Jan 15th 2014, a group of 6 workers and a leader of the group were entering into working mine with the opposite direction of exhaust air flow through ventilation door +73. When coming to the level -30 having much of smoke, the leader of group had telephoned to deputy shift manager about much of smoke in the tunnel.

Map of fire area and examination direction



Progress of the incident

Deputy shift manager asked them to go out but the leader still entered. Coming to roadhead -60, he couldn't go. He used filter self-rescuer POG 8 but not alive. Rescue team of VMR found him at this position at 2:30 am Jan 16th 2014.

When having much of smoke, two workers were actively running along the air pit down -105 but there still were much of smoke. One worker alived and the other died at the roadway level -105 on the east, from three-way crossheading about 50 meters. Rescue team of VMR found him at 2:00 am Jan 16th 2014.

Progress of the incident

The fire was determined from the heading of conveyor at level -105, fire along the conveyor to the wood and scrap conveyor of the air pit bulkhead -105 -:- -30. Due to the heat of the fire to very high temperature airflow from the exhaust fan located at the door +73 so fire quickly spread to the air pit -105 -:- -30 and the whole roadway +30.

Measures to resolve the incident

Receiving report of the incident, VMR dispatched rescue teams to combine the company with troubleshooting. Before rescue time coming, the company's workers were going along airflow and using water to extinguish the fire burning the conveyor at level -105.

Measures to resolve the incident

Objects of VMR's two examination directions are entering the roadway -105 and accessing the roadway -30. In the centre air pit examination direction, rescuers found the leader of the group at roadheading -60. The tunnel was very hot and almost catched fire. The other direction rescuers found the second victim at -105. The two directions couldn't enter more because of too high temperature.

Measures to resolve the incident

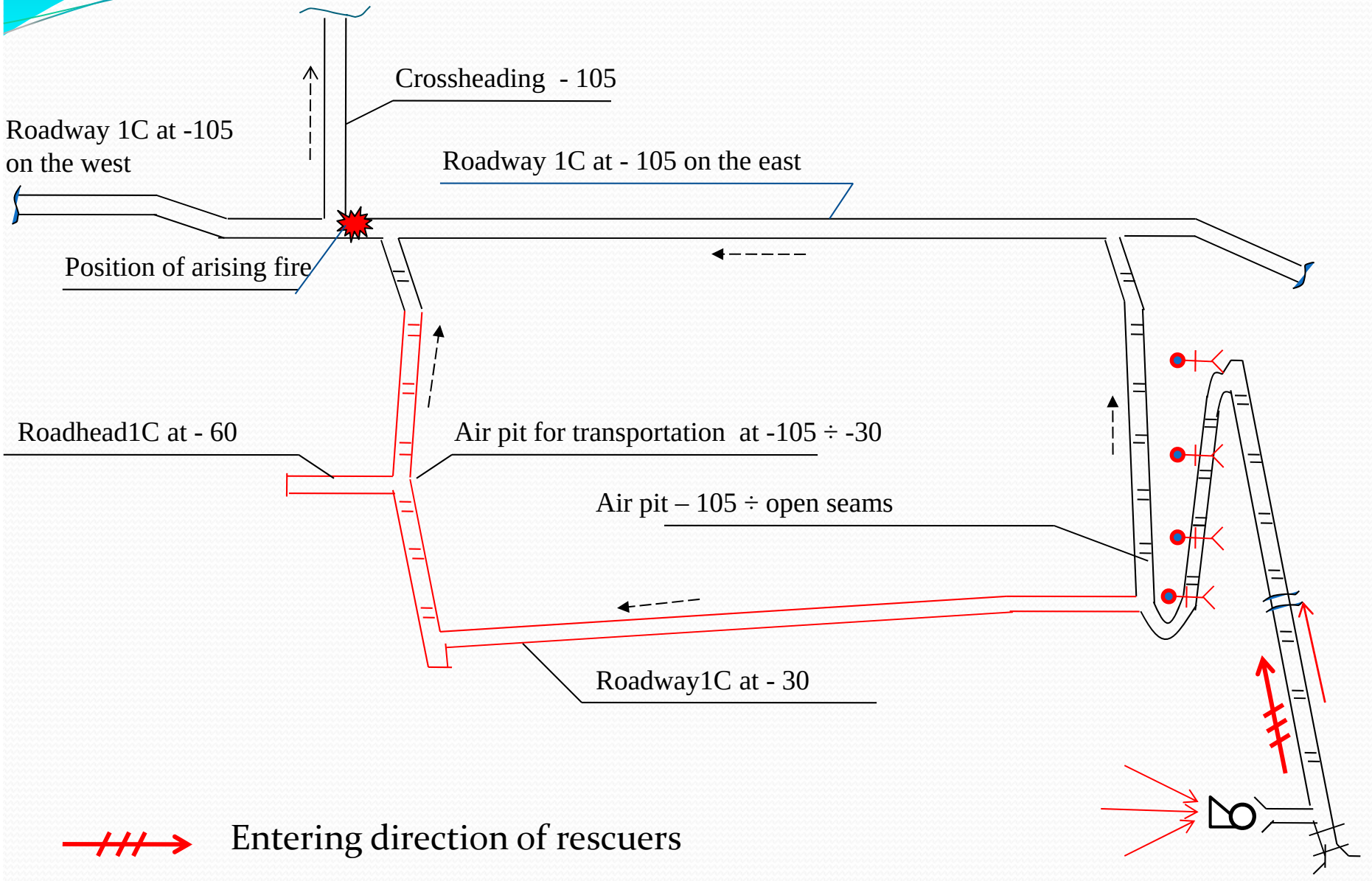
There were not four found victims. In the prediction, they were may be in the roadway level -30, but due to too high temperature could not be approached. Rescue body basing on the company's database and the deputy shift manager's report had determined to reversal airflow direction. At the time 4:30 am, the main fan at the door +73 was working as exhausting mode to be changed as flushing mode to push clean air to approach the roadway level -30.

Measures to resolve the incident

All of 4 engines of 2 fans operated and after 1 hour smoke was pushed pressed down 60 metres. After 2hours rescuers reached the 4 victims.

7:30 am Jan 16th 2014, VMR's rescuers have taken enough bodies of 4 victims out, ending examination.

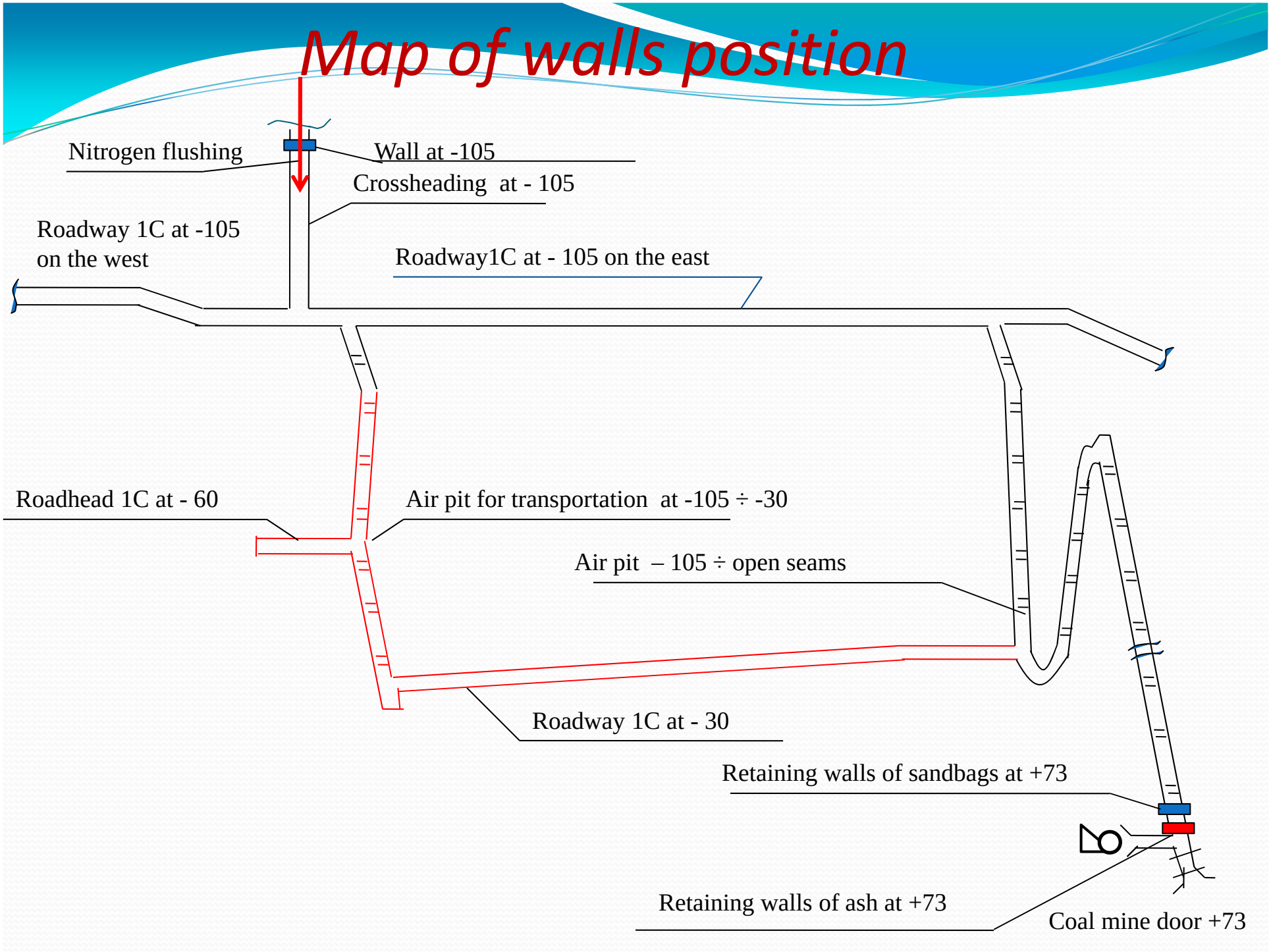
Map of reversal airflow direction and victims' position



Measures to resolve the incident

Then fire extinguishing was done by combination methods that was built walls on the two entering sides of the fire. One wall was built in the crossheading level -105 and the other was built in the door +73 to isolate fire zone. To 4:00 am Jan 17th 2014 was completed on both walls. Then 2 JXZD-200 nitrogen generator for coal mine were operated 20hours/day flushing nitrogen with average flow 370m^3/hour. Nitrogen flushing began immediately after completion of construction of the two walls.

Map of walls position



Result

During flushing nitrogen, air sampling inside walls was daily taken for analysis and evaluation.

To 21.03.2014 based on the analysis results of gas inside the two walls, rescuers has broken down the two walls to survey and examine. The fire was fully extinguished.

Comment:

The incident was unfortunate but was resolved successfully :

- Analyzed the situation based on the information provided and taking the right steps, offering appropriate solutions.

- Performing reversal airflow direction to search for victims in a short time.

- Building the retaining walls and the flushing nitrogen quickly to extinguish the fire.

Experiences from the incident

* *Measures to prevent fires*
* *The measure of employee and staff behavior*
* *Ensuring favorable reversal airflow direction*
* *Ensuring rescue working*

Measures to prevent fires

- Providing inability catching fire materials using in underground headings (conveyors, power cable, resistant materials, bulkhead, ...)

- Arranging the operator or equipment operated with automatic shutdown mode when overloaded, ensure that these devices are highly reliable (working well) not to overload the machine operation, friction heat burning conveyors.

- Installation of cameras to monitor the development in underground headings

The measure of employee and staff behavior

- Training for workers handling measures when problems occur:

+ When the atmosphere in the mine has more CO or CO2, then quickly run out by the shortest road

+ Once having run out command, do not deliberately go into and damage for himself and collegues;

+ Supplying self-rescue equipment to workers for breathing in the air pollution area.

Ensuring favorable reversal airflow direction

- In underground coal or mineral mining or mineral need to frequently trial reversal airflow when having fire could be able to reversal airflow for searching and rescue service:

+ Using fan station capable of reversing airflow.

+ Using double door system for reversal airflow and the system should be checked regularly to ensure operating within 15 minutes.

+ Every 6 months/time performing tria reversing airflow to examine the possibility of fan stations, air adjusting door systems.

Ensuring rescue working

- Coming to the incident place in the shortest time,

- Surveying details and providing survey information by the fastest way;

- Analysis of the conditions to predict the number of trapped people and their position to search;

- Based from surveys and studies documenting the trial reversal airflow before, proposals with leaders whether not reversible?

Ensuring rescue working

- Preparing the materials to build walls as quickly as possible to isolate the fire.

- Regularly checking reliability and availability of the nitrogen generation to be ready to do the task.

- Making use of all pipes for fastest leading nitrogen into fire.

Thank you for your attention!