



MINES RESCUE SERVICES (PTY) LTD SOUTH AFRICA

MANAGEMENT SYSTEM AND EMERGENCY PREPAREDNESS

Christo de Klerk | Chief Executive Officer, Mines Rescue Services | IMRB 2017 RUSSIA | September 2017



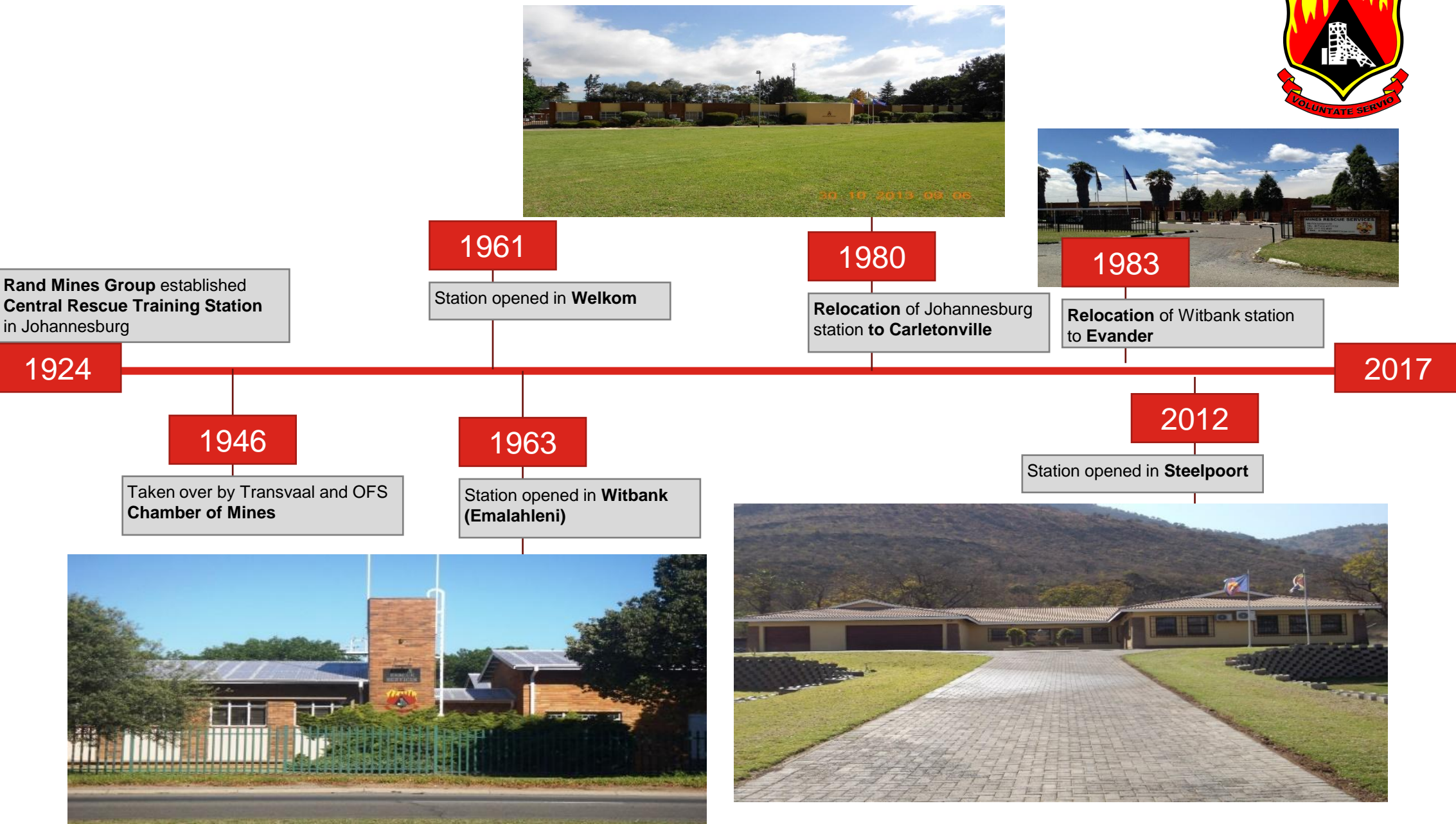
MINES RESCUE SERVICES SOUTH AFRICA



- Private sector organisation
- Trains volunteers for mine rescue work
- Administers rescue service scheme
- Provides rescue and recovery services, resources and expertise for an effective emergency service, primarily for the South African mining industry



HISTORY OF MINES RESCUE SERVICES



SERVICES PROVIDED



- Train Rescue Team Members (Brigadesmen) to required skills competency
- Provide expert advice, consultancy service to all member mines
- Remain proactive to changes in technology in the mining industry, environment
- Provide, maintain specialised equipment for all member mines



INTERNATIONAL CONTACT

- Training provided in:
 - Zimbabwe
 - Zambia
 - Tanzania
 - Democratic Republic of Congo
 - Ghana
 - Swaziland
 - Botswana
 - Mali
- Training provided for China, Iran, Russia



Work Load Training



MRS ORGANISATIONAL STRUCTURE



MRS BOARD OF DIRECTORS

Consist of:

1. Eight largest contributors
2. Chamber of Mines of SA
3. Mines Rescue Services
4. Department of Mineral Resources (DMR)
5. Labour

MRS MANAGEMENT COMMITTEE

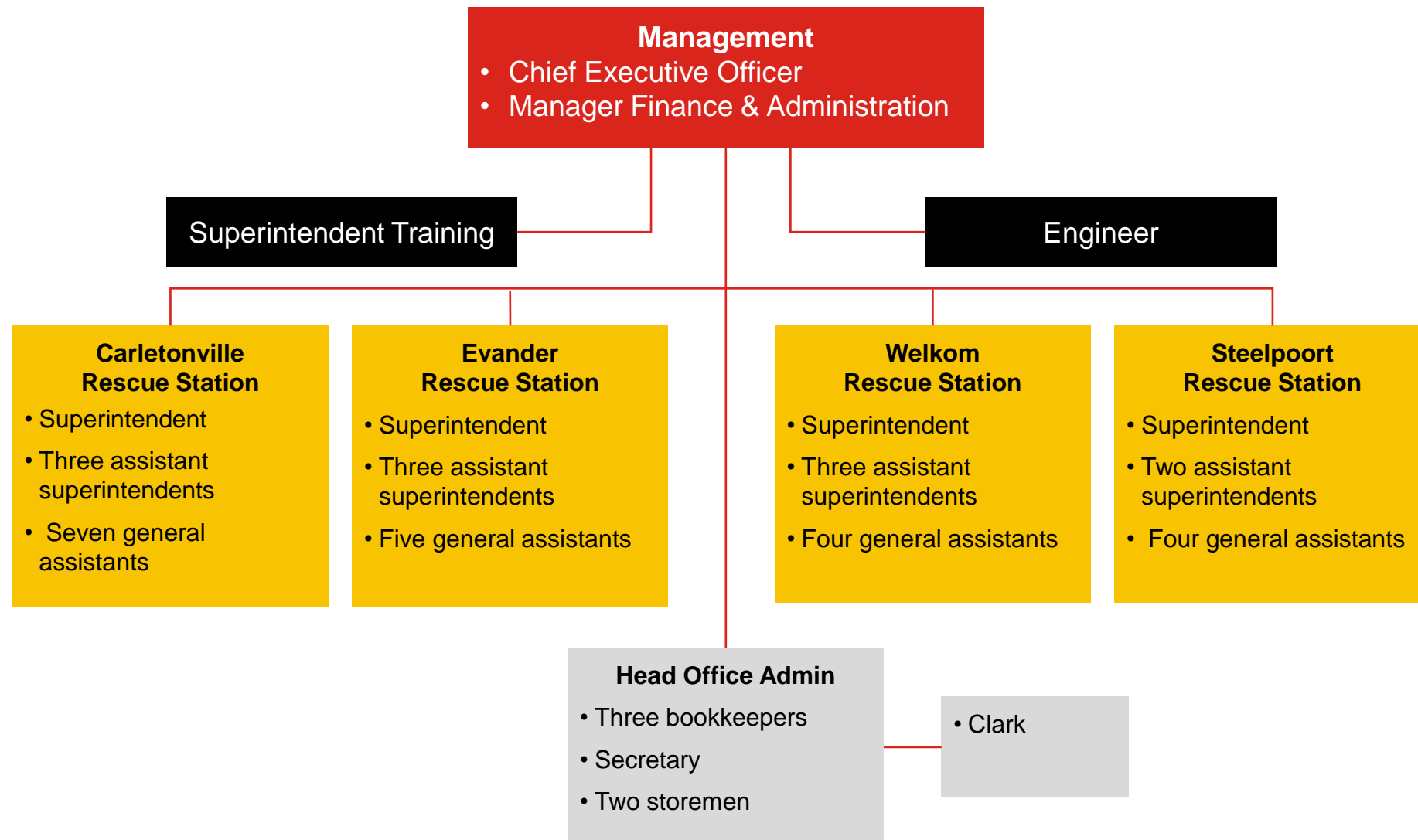
- CEO of MRS (Chairperson)
- South African Colliery Managers Association (SACMA)
- Association of Mine Managers of South Africa (AMMSA)
- South African Engineers Association (SACEA)
- Association of Mine Resident Engineers of South Africa (AMRE)

**MRS
operations**

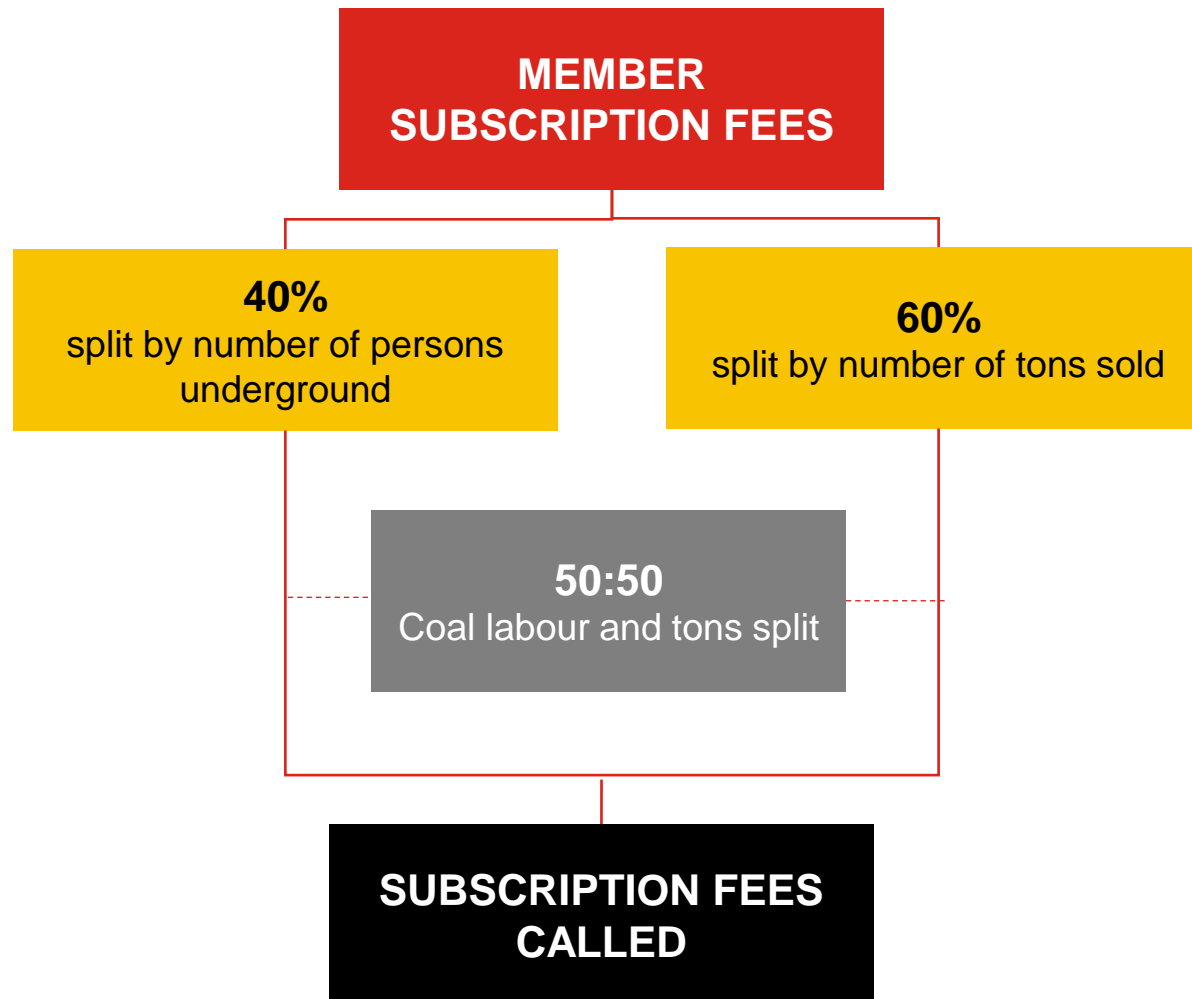
MRS ORGANISATION STRUCTURE



45 employees in total



HOW MRS IS FUNDED



LEGAL REQUIREMENTS OF SOUTH AFRICAN MINES



- **Mines Health and Safety Act, 1996, Chapter 16.5, Emergency Preparedness and Response:**

- every employer at every underground mine must maintain rescue teams in the following ratio:

- 100 – 1 100 underground employees

One team

- 1 101 – 3 600 underground employees

Two teams

- 3 601 – 8 100 underground employees

Three teams

- more than 8 100 underground employees

Three teams

- at least one additional team for every additional 6 300

MRS MEMBERSHIP SCHEME

- Two membership classes
 - A Class members
 - maintain own team/s
 - B Class members
 - do not maintain own team/s
 - can call for assistance from neighbouring mines through MRS



ADDITIONAL AGREEMENTS



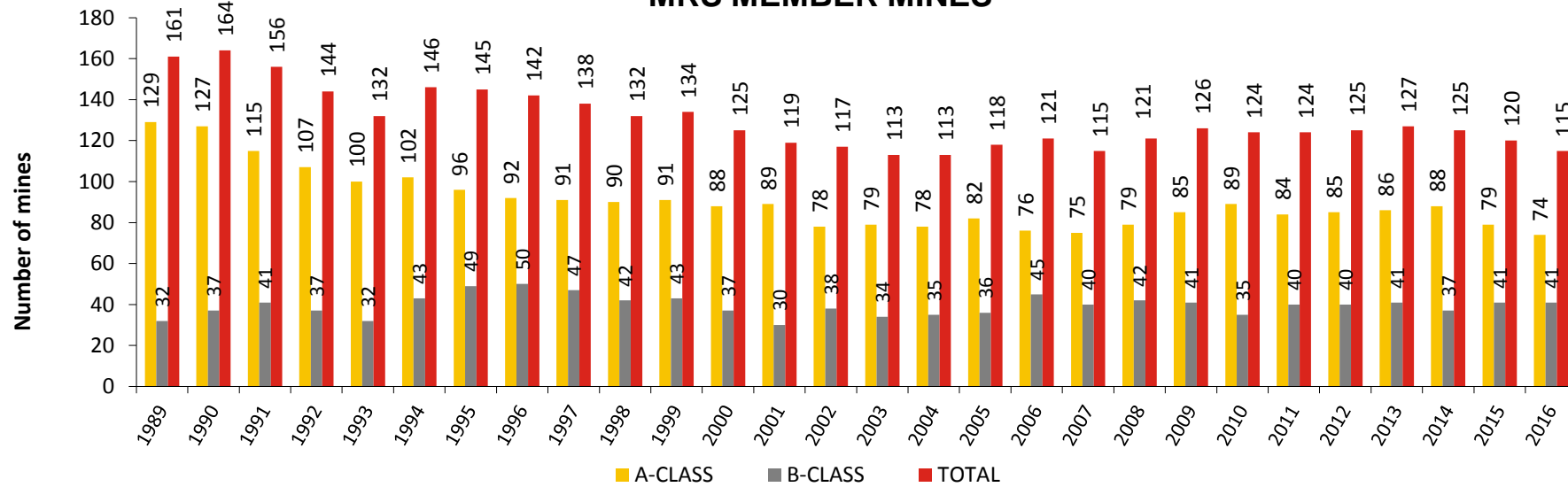
- Agreement with Department of Mineral Resources (DMR) to render assistance at abandoned and other mines approved by DMR
- Agreements with non-member mines in the event of required assistance



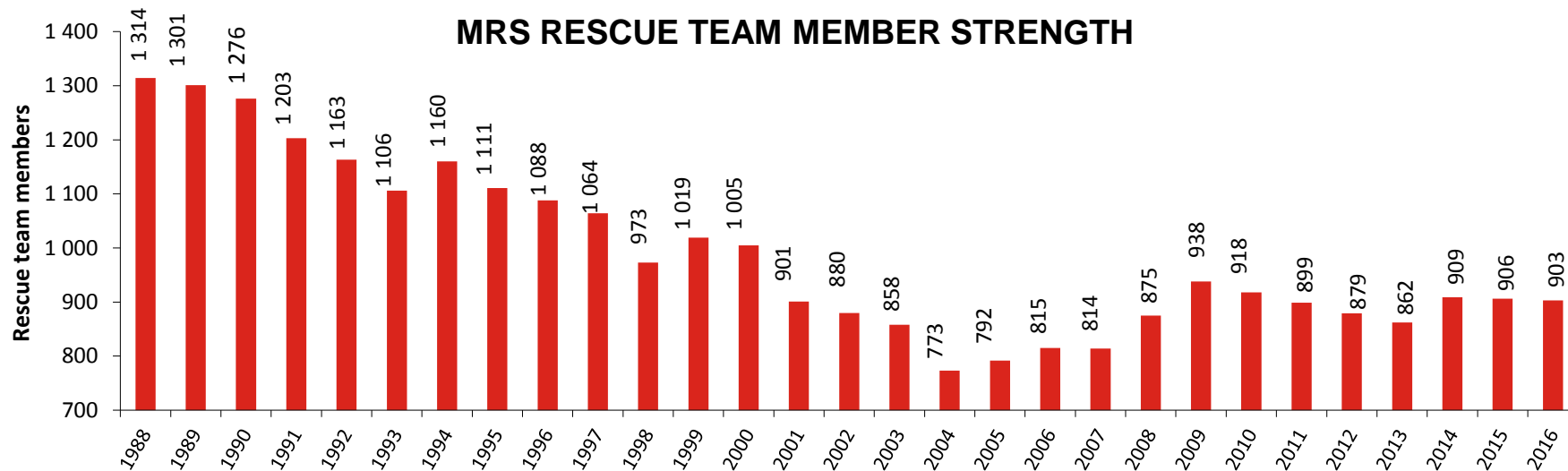
OUR MEMBERSHIP



MRS MEMBER MINES



MRS RESCUE TEAM MEMBER STRENGTH



RESCUE TEAM MEMBER REQUIREMENTS



- All team members are volunteer mine employees
 - paid their normal shift rate for their rescue service by their employing mine
 - in addition, a fee for service by mines requiring the service during active duty
- Characteristics required of members:
 - stable temperament
 - responsible
 - used to discipline
 - experienced in underground work
 - aged between 21 and 46
- Volunteers must attend a five-day initial training course based on Quality Council for Trades and Occupations qualification



RESCUE TEAM MEMBER REQUIREMENTS



- All volunteers must undergo the following:
 - Medical examinations
 - initial medical examination
 - periodical medical examination (six-monthly)
 - pre-operational medical examination/declaration
 - Heat Tolerance Test
 - Work Load Test
 - Mines Rope Rescue Training



Heat Tolerance Test

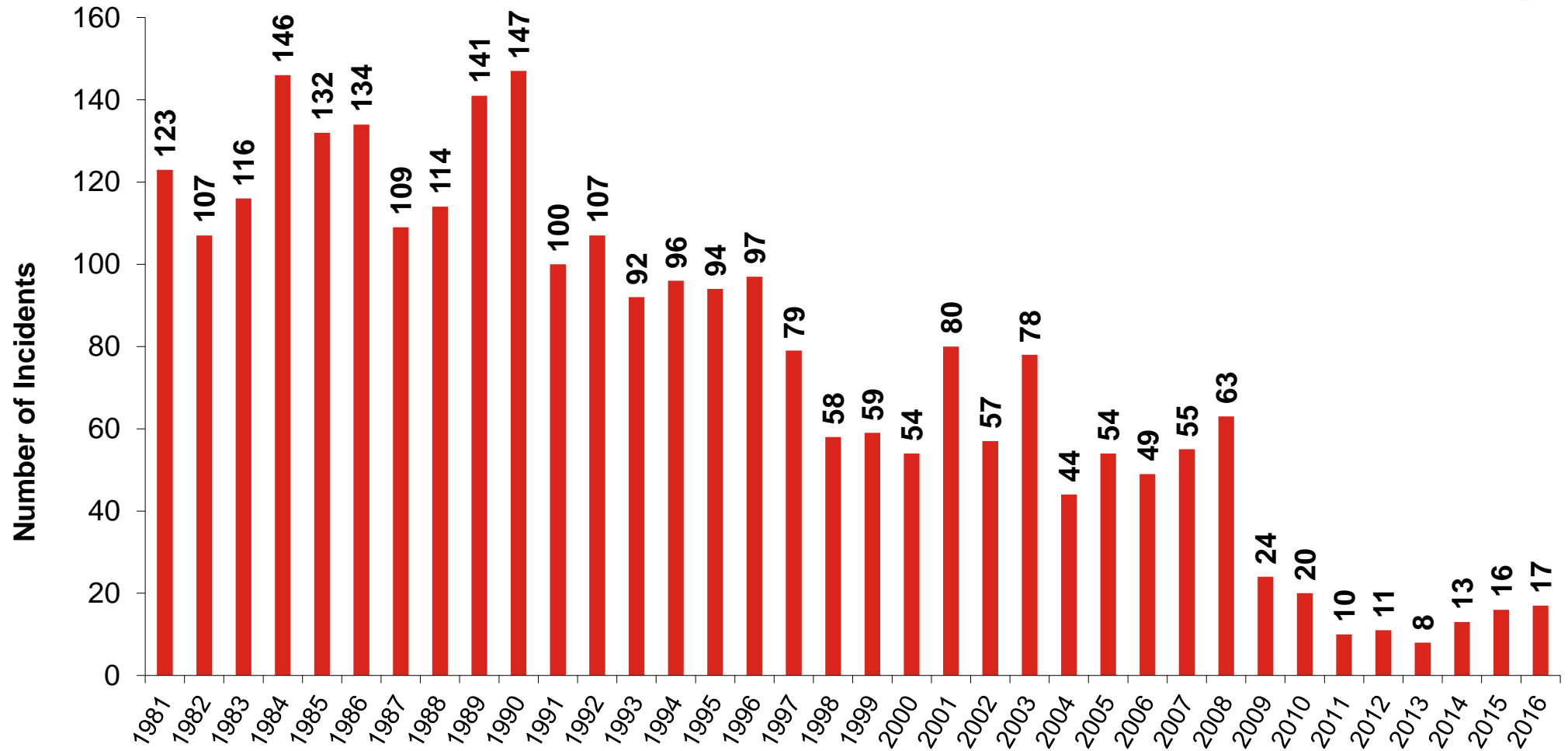
A TOTAL EMERGENCY SERVICE



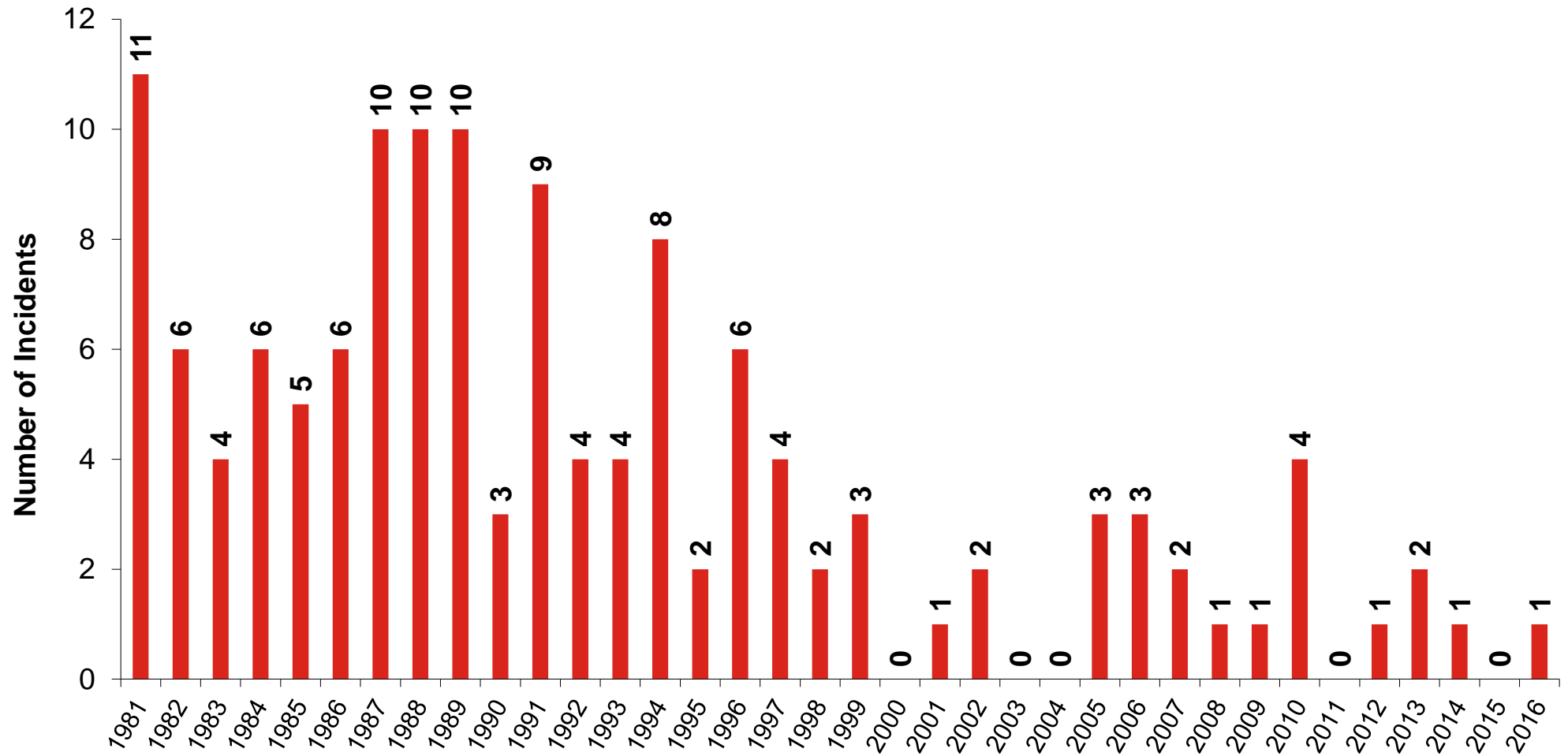
- MRS is called upon, but not limited to, the following mining emergency situations:
 - fires
 - explosions
 - fall-of-ground incidents
 - missing persons
 - body recovery



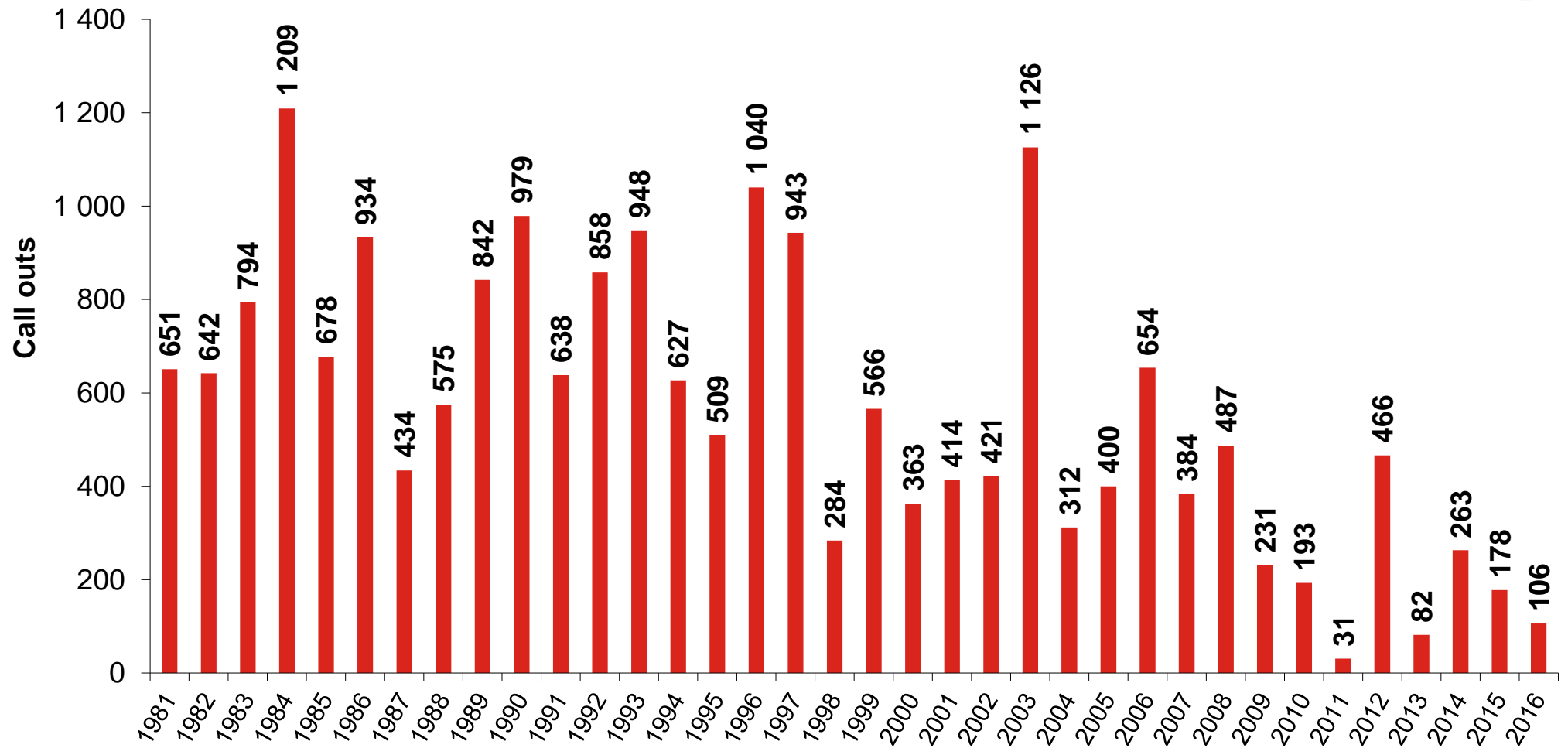
METALLIFEROUS FIRES 1981-2016



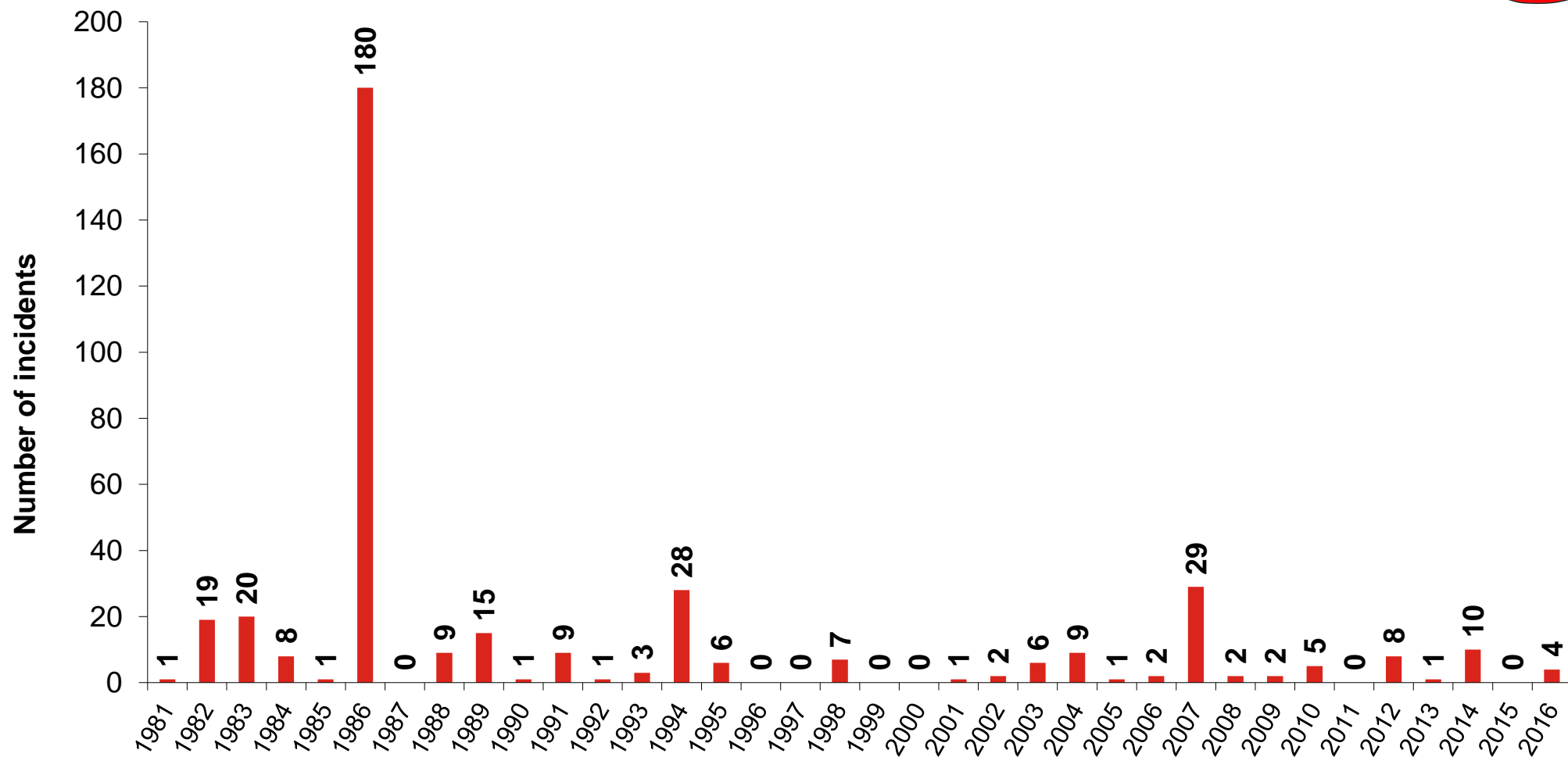
COLLIERY FIRES 1981-2016



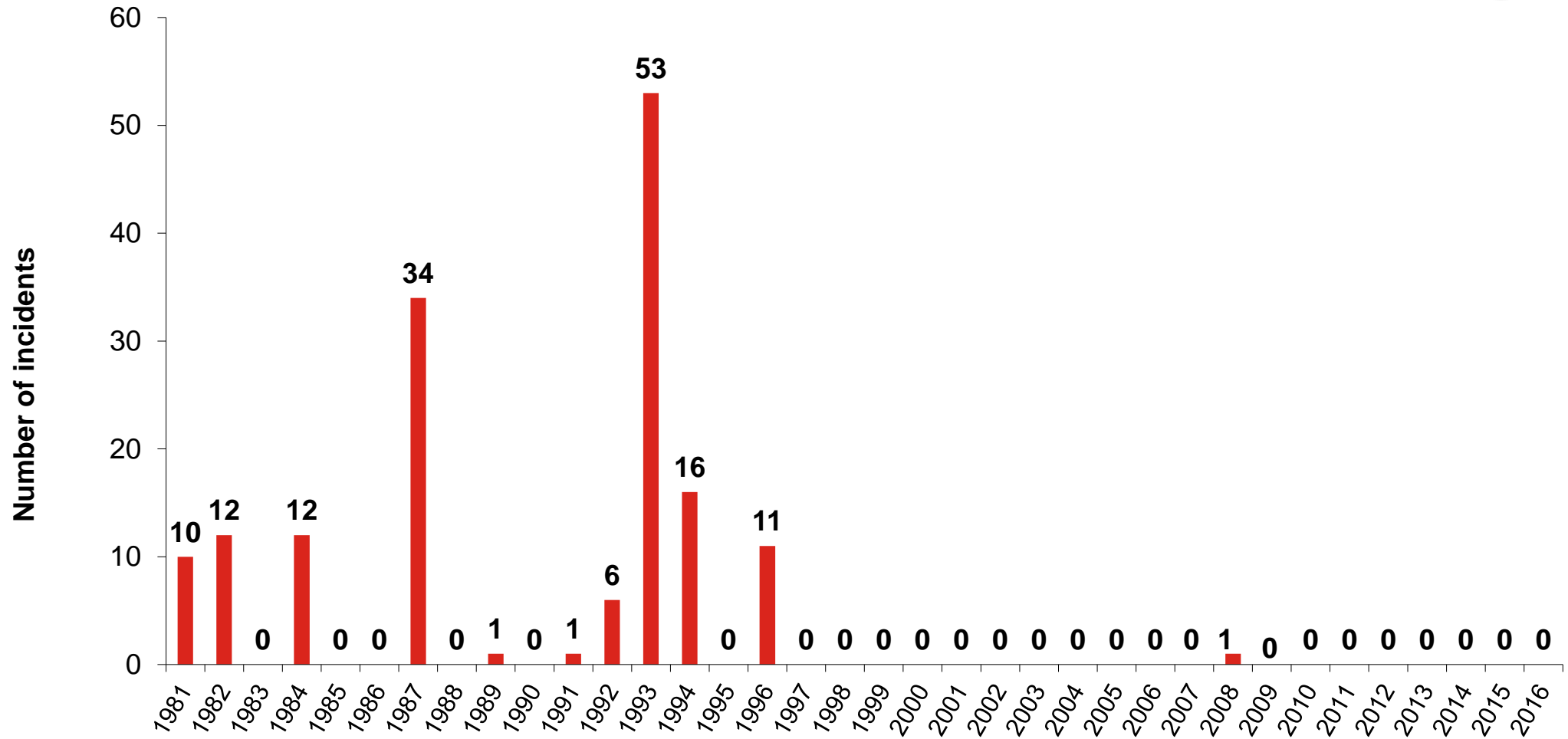
RESCUE TEAM USAGE (ALL FIRES) 1981-2016



METALLIFEROUS FATALITIES DUE TO FIRES, EXPLOSIONS 1981-2016



COLLIERY FATALITIES DUE TO FIRES, EXPLOSIONS 1981-2016



RESCUES INVOLVING SPECIALIST RESCUE TECHNICIANS – 2017 TO DATE



- 317 incidents
- 645 Rope rescue technicians
- 435 Rescue teams
- Recovered 21 bodies
- Rescued 7 persons

MAJOR FIRES AND INCIDENTS



A few of the biggest incidents from the past 92 years are:

- The worst mining disaster in South Africa occurred in the Coalbrook coal mine of Clydesdale Colliery on 21 January 1960 where 435 workers lost their lives following a collapse
- 16 September 1986 – 177 workers' lives were claimed by the Kinross disaster
- 31 August 1987 – 63 workers died at St Helena Gold Mine as a result of an underground fire
- 13 May 1993 – 53 workers died due to methane explosion at Middelbult Colliery
- 10 May 1995 – 104 people died in the Vaal Reefs shaft accident



SOME SIGNIFICANT RESCUES

- Following a shaft accident on 13 October 1993, 152 people were rescued over seven-day period
- 2011 – 162 people rescued
- 2012 – 219 people rescued
- 2013 – 36 people rescued
- 2014 – 100 people rescued
- 22 February 2015 – 486 during a fire
- 2 July 2015 – 18 during a fire
- 10 July 2015 – 51 during a fire
- 23 September 2015 – 65 during a fire
- 2015 – 16 people rescued during other incidents
- 2016 – 144 people rescued



EMERGENCY PREPAREDNESS



DRÄGER BG 4





AGILENT 490 GAS CHROMATOGRAPH



- Fastest GC in the world (200 seconds)
- Portable
- Accurate up to 1ppm
- To detect spontaneous combustion and analyse gases from colliery and metalliferous fires

THERMAL IMAGING CAMERA



SUB STRATA RADIOS



ROVER OREPASS CAMERA



ROPE RESCUE EQUIPMENT



GRIPTECH



SKYJACK



1200 METER EMERGENCY LIFTING MACHINE



3100 METER METALLIFEROUS MOBILE WINDER









COLLIERY RESCUE DRILL UNIT

Schramm T685 WS Probe Hole Drill Unit



COLLIERY RESCUE DRILL UNIT

Schramm T130 Rescue Hole Drill Unit



COLLIERY MOBILE RESCUE WINDER



COLLIERY MOBILE RESCUE WINDER





COLLIERY INERTISATION SYSTEM









ILLEGAL MINING AT ABANDONED MINES

BARBERTON

AREA

2006









ROODEPOORT

AREA

2013













EAST RAND











Blue Ribbon
BREAD
PREMIER
WHITE













FACTION *FIGHTING*













FACTION *FIGHTING*

November 2015















UNDERGROUND

CONDITIONS

























15/09/2015 10:50



15/09/2015 10:23



15/09/2015 11:28



SHAFT



INCIDENTS

ABANDONED SHAFT

24 February 2016









ABANDONED SHAFT

Zamas Descending
254m





Welkom
ARM 3 Shaft
22- 24 May 2012

COAL MINES



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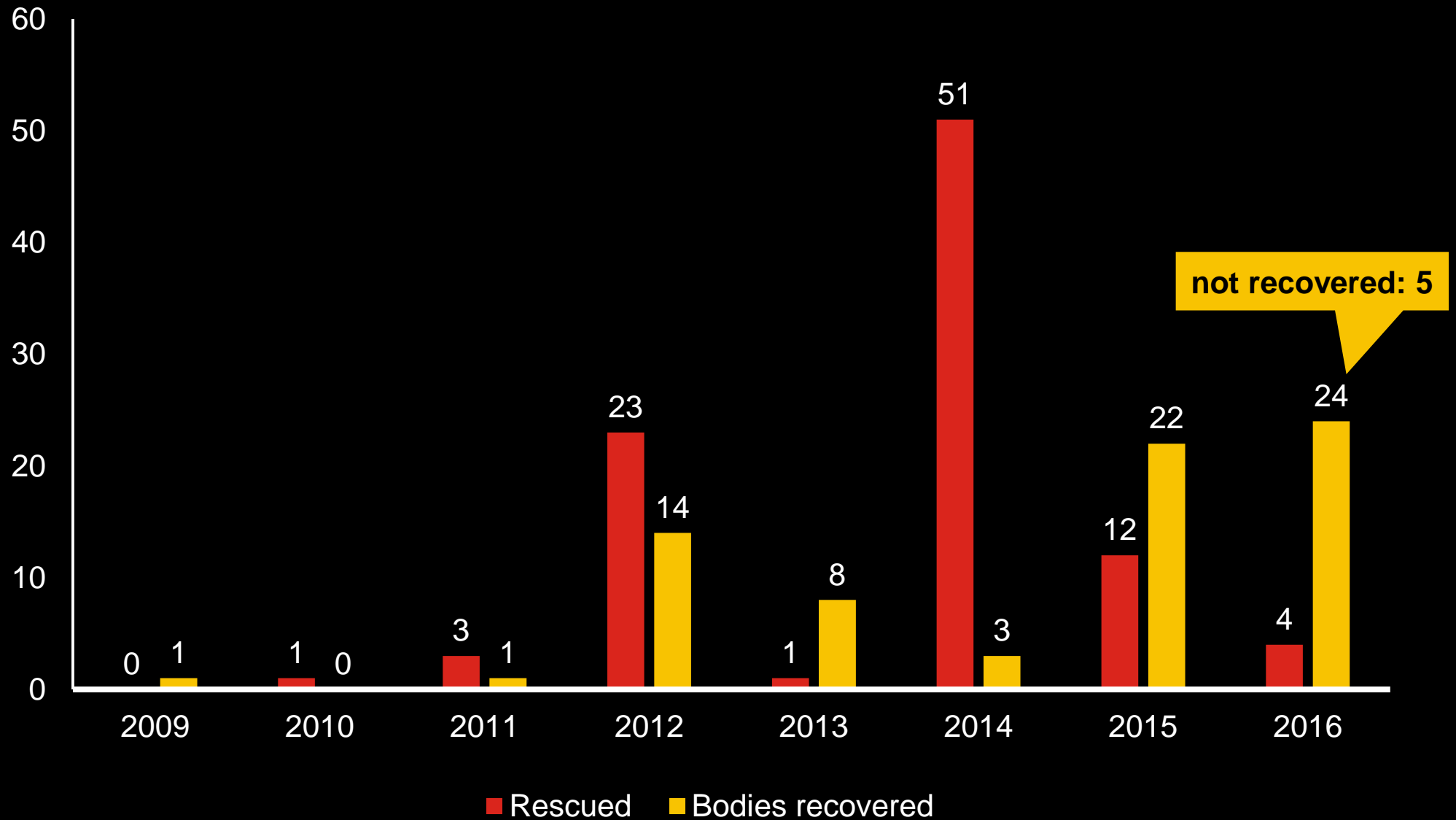
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ILLEGAL MINING INCIDENTS







THANK YOU

Christo de Klerk | Chief Executive Officer, Mines Rescue Services | IMRB2017 RUSSIA | September 2017