Learning from the
Kiss Nightclub Fire
Karen Boyce
Acknowledgements

• **Prof. Eng. Luiz Carlos Pinto da Silva Filho** (coordenador), diretor do Centro Universitário de Estudos e Pesquisa sobre Desastres (CEPED/RS) e Diretor da Escola de Engenharia (EE) da UFRGS;

• **Eng. Carlos Wengrover** (coordenador adjunto), coordenador do Comitê Brasileiro de Segurança contra Incêndio da ABNT

• **Dr Rodrigo Machado Tavares**, Fire Safety Engineer at RMT Fire & Crowd Safety
Overview

• Kiss nightclub, Santa Maria (Rio Grande do Sul), Brazil, Sunday 27\textsuperscript{th} January 2013

• Blaze began at approx 02.30 local time during performance by Gurizada Fandangueira (country music band)

• Caused by pyrotechnics igniting flammable ceiling

• 242 deaths, 168 injuries
• Band lit sputnik on stage which ignited flammable sound proofing foam on ceiling

• Flare was cheap ($1.25?) and can reach 4m (Brazilian Association of Pyrotechnics) - not to be used in closed environments

• Band originally claimed that they hadn’t used sputnik but rather fire caused by electrical short circuit – disproved

• Ignited flammable sound-proofing on ceiling
During the Fire

- 1000+ occupants
- Initially band were passed a fire extinguisher which didn’t work
- People (briefly) prevented from leaving because they hadn’t paid their bar tab (comanda)
- Fire department was close and arrived quickly (occupants using social media to inform) but already hampered by bodies blocking exit
- Partygoers helped firefighters pound windows and walls to free trapped - 90% died of asphyxiation
Area 1 (left)
Area 1 - stage
Aftermath

- In total 16 people charged
- April 2013 – two nightclub owners and two band members accused of “negligent homicide”
- Others (including firemen) charged with obstructing course of justice - false information used by the club and approved by the fire department
• Brazil population: 198 million

• Santa Maria in Rio Grande do Sul, southern state in Brazil (borders Uruguay and Argentina)

• State has population of 10.7 million

• Highest standard of living in Brazil
• In 1970’s fire in Sao Paolo (Joelma Building, 1974, 189 deaths, 320 injured) prompted safety regulations (prescriptive) that became national model BUT

• In reality each state (including Rio Grande do Sul) individually creates its own regulations

• Either can be used and different states have different guidance

• Often eg in Sao Paolo you can find 3 different stair sizing approaches (using Fire Safety Standard NBR9077, Sao Paolo’s own regulation or a ‘city hall building code’)

Brazilian System of Regulation
Fire department are the controlling authority – they develop regulations and approve

Calls for agreed national fire safety regulations but being resisted by fire departments of each state which each claim to have the best!

Under the Ministry of Labour, there is Health and Safety Law which requires frequent checks (and issuing of certificates) but rarely enforced
History of the Kiss Nightclub – Occupancy changes

- Built in the 1950s, originally a warehouse
- In 2003 changed use to a small college
- In 2009 significant refurbishment to nightclub
The Fire Certificate

- first license for the club issued August 2009 after receipt of a fire safety strategy for the nightclub
- last inspection took place in August 2011 (expired)
- stated that the club had two emergency exits and had sufficient extinguishers, licensed for 691 people
Post Fire Certificate

- February 2012 – refurbishment of the stage, ticket office, built dressing room, mezzanine, and VIP area also with mezzanine
- November 2012, put in suspended ceiling (1.5 m below original) with flammable acoustic lining
- Demolished internal walls
- All without permission or without informing authorities
Active Systems
(Required v Reality)

- At minimum a manual detection and alarm system (it had none)
- Emergency lighting (had but didn’t work)
- 12 fire extinguishers (had 7 and at least one didn’t work)
- Did not require or have sprinklers or smoke control
Means of Escape
(Required v Reality)

- Occupancy classifications similar to purpose grouping but more specific – F6 club
- Fire certificate licensed for 691 (floor space factors for an F6 building would suggest 1230 (based on 615 m²)
- Estimates of numbers vary (range from 1000-1500) but, according to ex-employees, 1400 was commonplace
Means of Escape
Requirements v Reality

- Number of exits depends on occupancy and size of building (> or < 750 m²), no requirements for remoteness – this building required 2 exits (it had 2 exits from space which merged at 1 final exit).

- Exit sizing based on unit width/100 people (5.5 mm/person) ie 3.8 m (plans suggest 2 x 1.8m (front entrance) but other sources suggest 2 x 0.8m and pictures?)

- Travel distance depends on 1 or more exits and sprinkler/no sprinkler) – in this case 40m (max travel distanced reported to be 32 m)
Entrance and Exit
Escape routes Area 2
Exit corridor with stairs and ‘foyer’ at exit
Rotas de saída do público

1. TRAJETO DAS PESSOAS

Inicio do incêndio
Área VIP
Banheiro

Logo que perceberam o fogo e a fumaça, as pessoas que estavam perto do palco começaram a correr procurando a saída para a rua.
Quem estava na parte central da boate e na área VIP enfrentou, segundo testemunhas, a resistência de seguranças que num primeiro momento barraram as pessoas que não tinham a comanda paga
Reported 180 bodies in toilets

Em meio ao tumulto e devido ao ambiente escuro, muitos foram parar nos banheiros numa tentativa de escapar pelas janelas, mas o revestimento da fachada impediu que elas fossem abertas.
Regulatory response

- State of Rio Grande do Sul published new guidance (December 2013) based on guidance already adopted by other states eg Sao Paolo
- Addresses use of fire retardant materials, the use of sprinklers and smoke control (check list)
- Groups calling for fire safety engineering but concerns over technical innovations
- Smoke control for pressurized stairs (NBR 14880: 2014) has just been published and it will be officially valid for use on 8th February 2014
Could these deaths have been avoided?

- Multiple death fires rarely just one reason or one person
- Fire safety depends on appropriate actions and decisions being made:
  - during the fire by occupants/staff and
  - (arguably more importantly) prior to the fire by design team, management and inspecting authorities
Not the first time......

- “The reason they died was the search for profit...” prosecutor Joel Dutra (Kiss)

- Station Nightclub, Rhode Island (2003):
  - Overcrowding
  - Flammable wall/ceiling coverings
  - Inadequate fire suppression devices
  - Improper use of pyrotechnics
  - Inadequate exits
Thankyou for Listening!
Incêndio
A banda Guzitada Fandangueira sobe ao palco por volta das 2h30. Durante a música ‘Amor de chocolate’, músicos utilizam um sinalizador para efeitos pirotécnicos. Fogo alinge o teto e se espalha.

Início do incêndio

Sinalizador em local fechado

Extintor falha
Um segurança e o vocalista da banda tentam usar um extintor que não funciona.

Tumulto
Pessoas começam a correr. Sem perceber de imediato o fogo, seguranças impedem a saída. Um ‘biombo’ travava a porta de entrada/saída e atrapalha a evacuação. Grades no lado externo foi outro obstáculo.

Fumaça e escuridão
Devido à fumaça e ao ambiente escuro, público tem dificuldade para localizar a saída e muitos correm para os banheiros, por onde não conseguem escapar.

Resgate
Sobreviventes tentaram tirar vítimas do local e quebraram as paredes da fachada. No banheiro, havia centenas de pessoas atoxidadas.