



Learning from the Kiss Nightclub Fire

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Acknowledgements



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

Overview

- Kiss nightclub, Santa Maria (Rio Grande do Sul), Brazil, Sunday 27th 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









The Fire

- 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

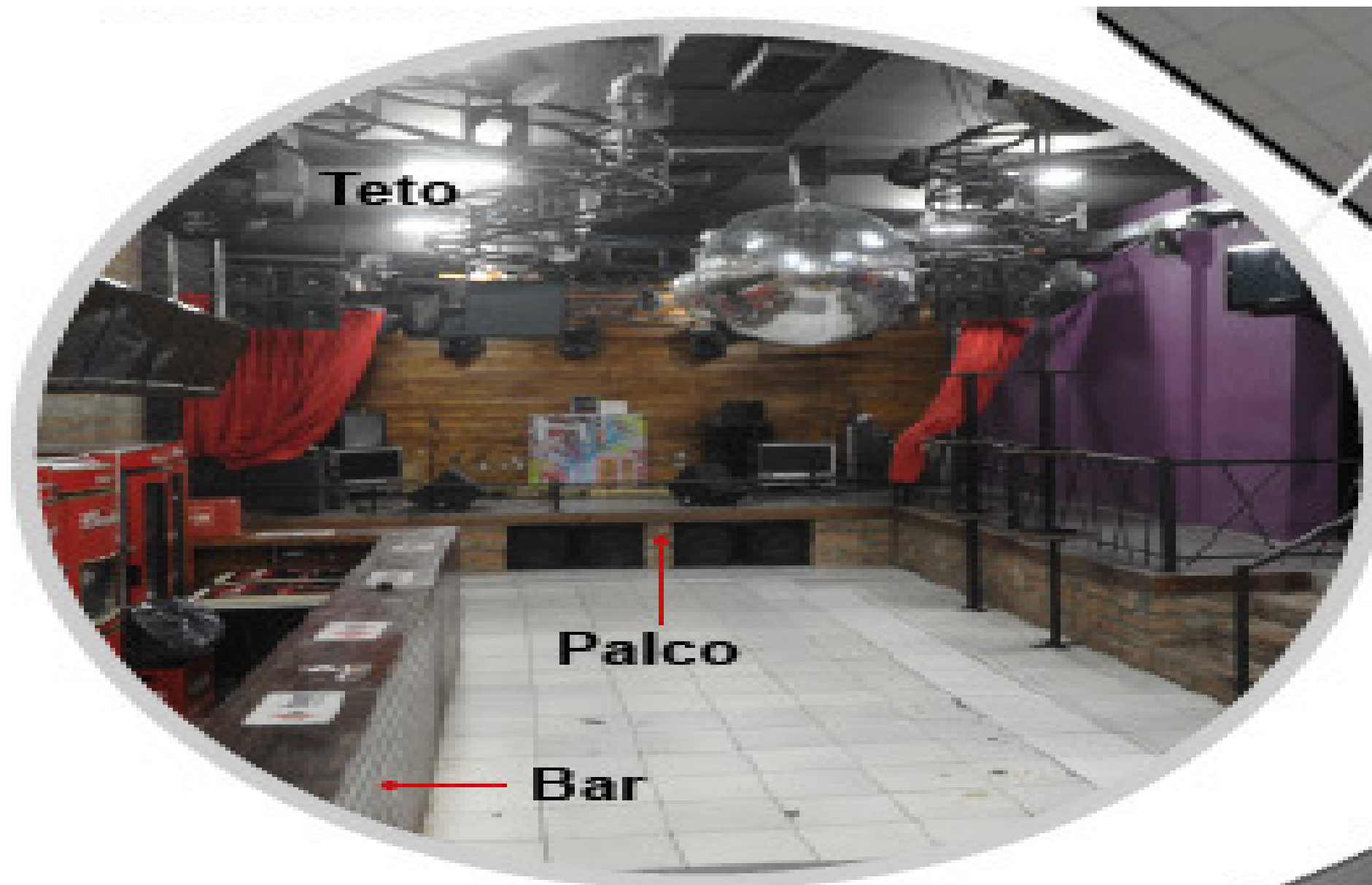


During the Fire

A decorative graphic consisting of a horizontal bar with a gradient from dark purple to orange, ending in a large, stylized arrowhead pointing to the right.

- 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





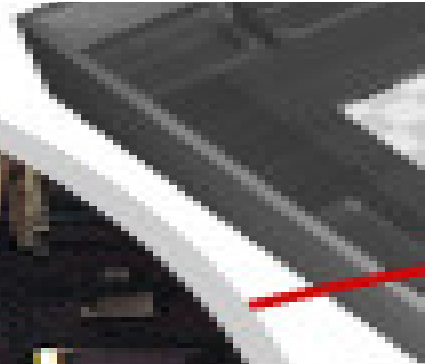


Area 1 (left)



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

Context

- 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



Brazilian System of Regulation



- 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

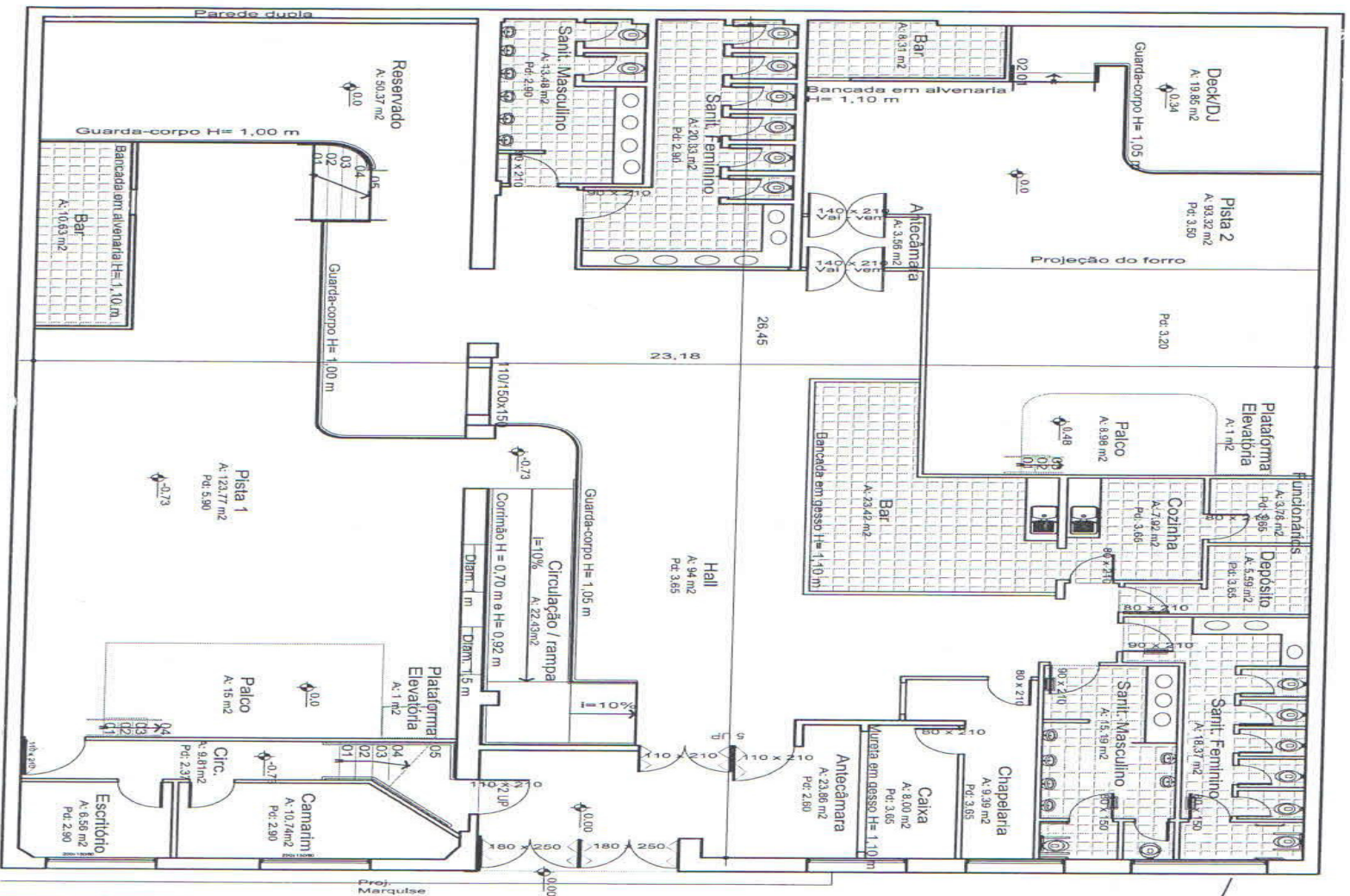


- first license for the club issued August 2009 after receipt of a fire safety strategy for the nightclub
- last inspection took place in August 2011 (expired)
- stated that the club had two emergency exits and had sufficient extinguishers, licensed for 691 people

Post Fire Certificate

A decorative graphic consisting of a horizontal bar with a gradient from dark blue to orange, ending in a large, stylized arrowhead pointing to the right.

- 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



Danceteria
A: 638,25 m²

F. Jnta Baixa
Escala 1/125



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

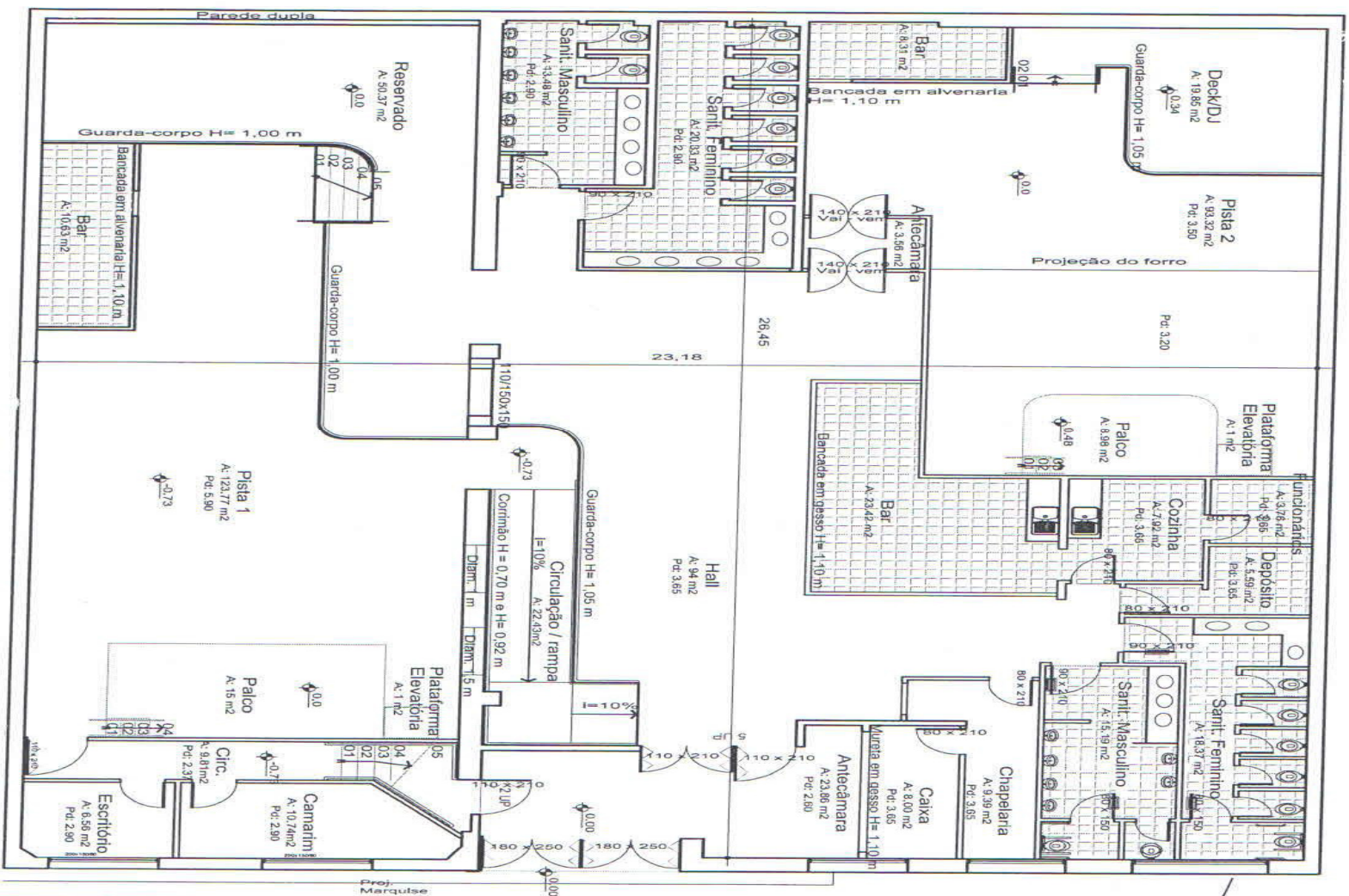
Means of Escape (Required v Reality)

- 
- A decorative horizontal bar with a gradient from dark blue to orange, ending in a stylized arrow shape pointing to the right.
- 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)

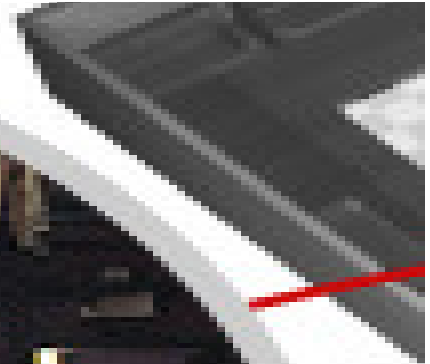


Danceteria
A: 638.25 m²

Finta Baixa



Entrance and Exit





Escape routes Area 2



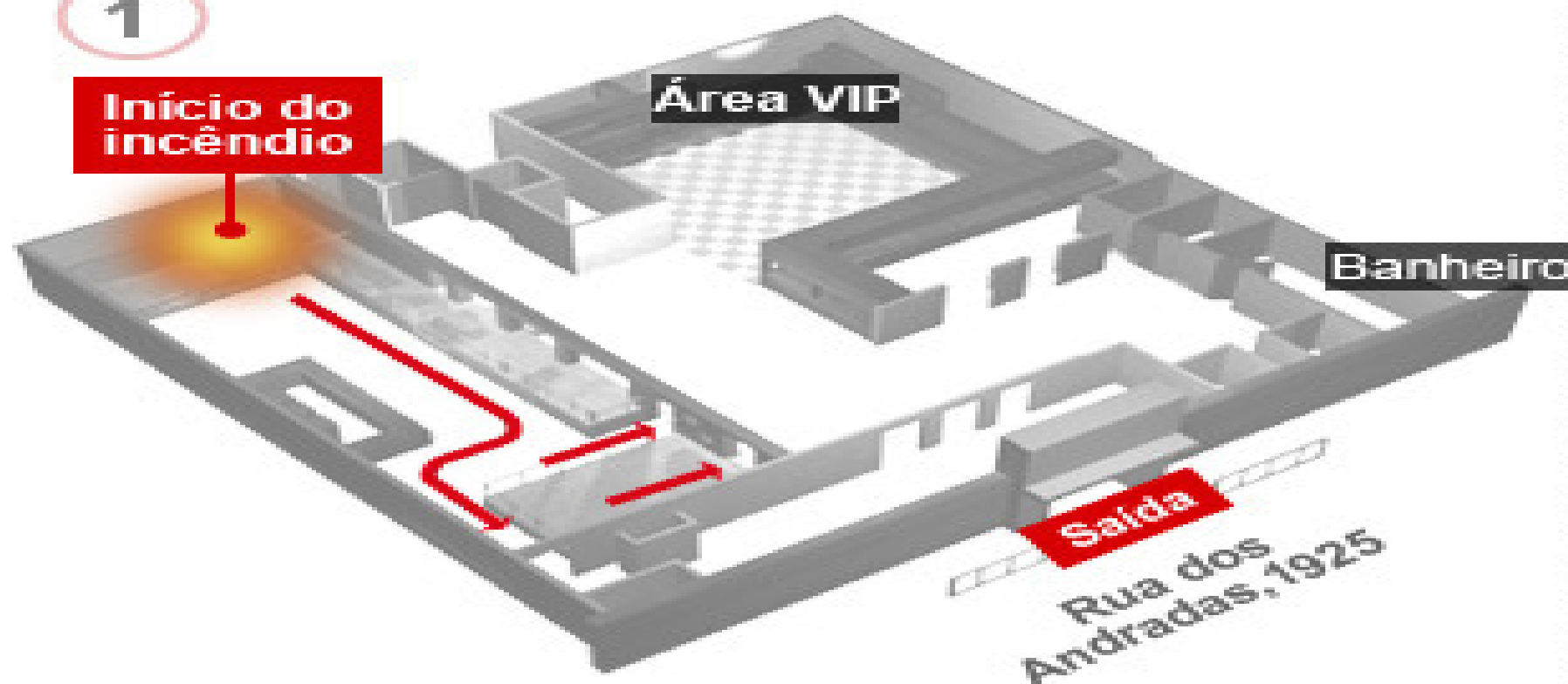


Exit corridor with stairs and 'foyer' at exit

Rotas de saída do público

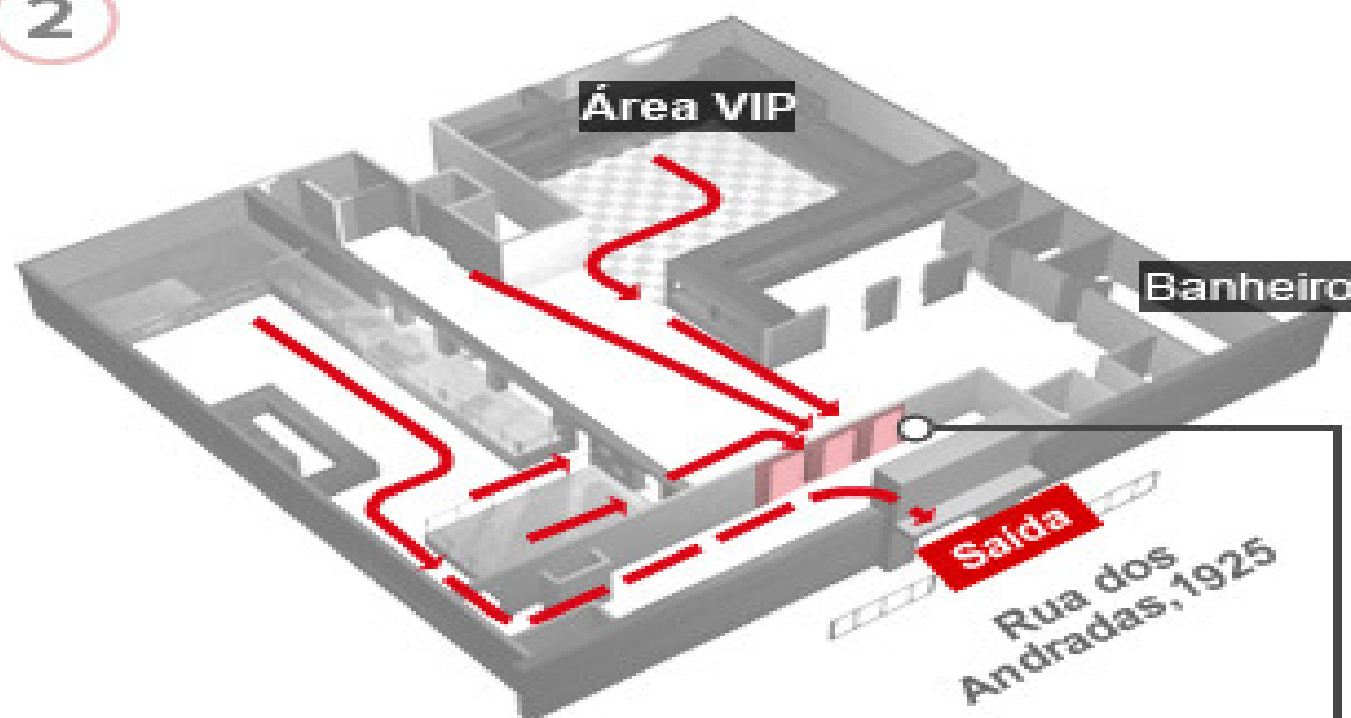
→ **TRAJETO DAS PESSOAS**

1



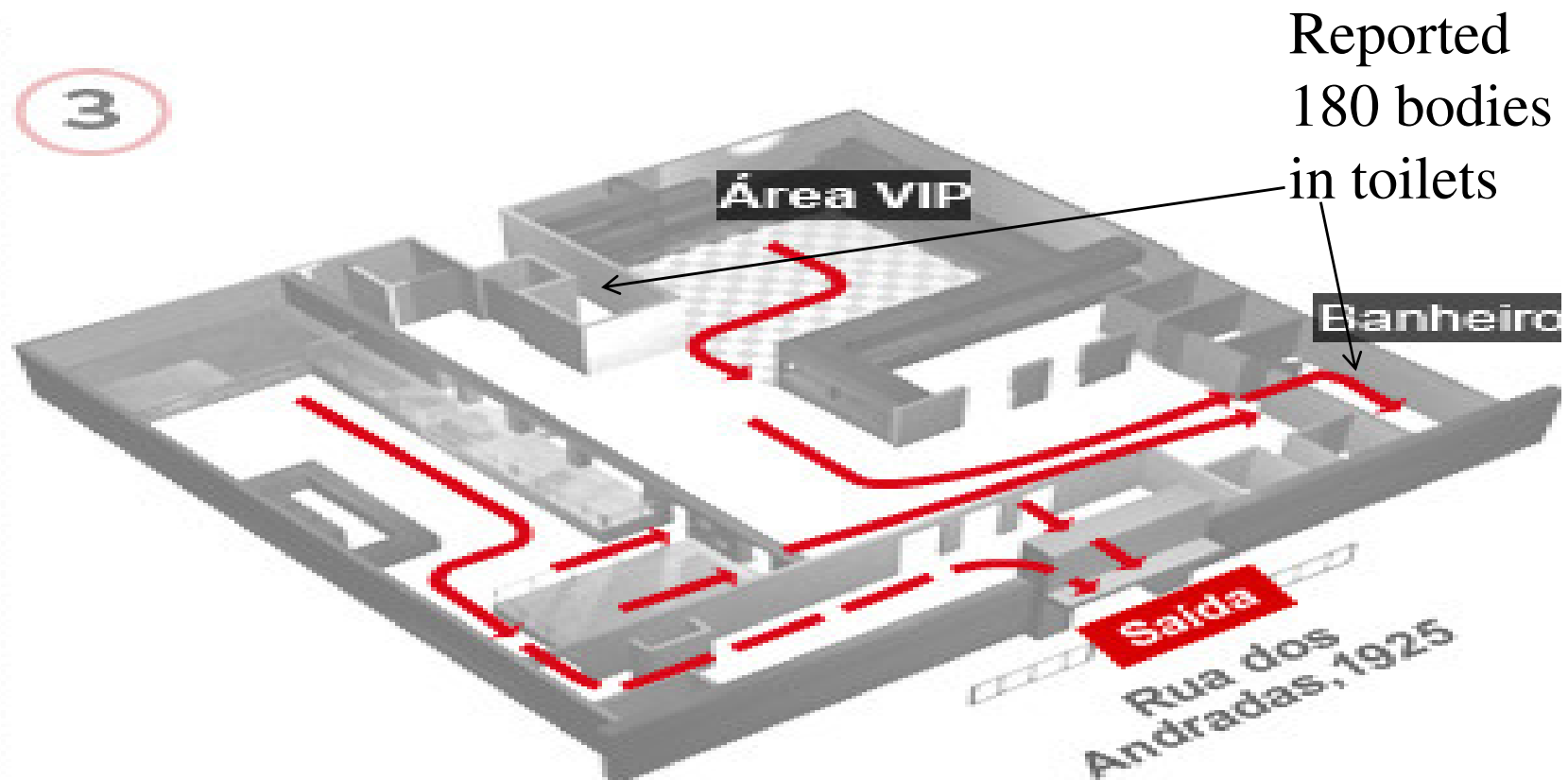
Logo que perceberam o fogo e a fumaça, as pessoas que estavam perto do palco começaram a correr procurando a saída para a rua

2



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

3



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 Paulo
- 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!

A banda Gurizada Fandangueira sobe ao palco por volta das 2h30. Durante a música "Amor de chocolate", músicos utilizam um sinalizador para efeitos pirotécnicos. Fogo atinge o teto e se espalha

Estimativa da polícia:
1.300
pessoas

Mortos:

242

Sinalizador em local fechado

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

Pessoas começam a correr. Sem perceber de imediato o fogo, segurancas impedem a saída. Um 'biombo' trancava a porta de entrada/saída e atrapalha a evacuação. Grades no lado externo foi outro obstáculo

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

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

Diagrama 3D do layout do salão de festas, com as seguintes áreas rotuladas: Banheiro, Saida, Caixa, Palco, Bar e Área VIP. Uma seta vermelha indica a transição da Área VIP para a fotografia de uma festa.





