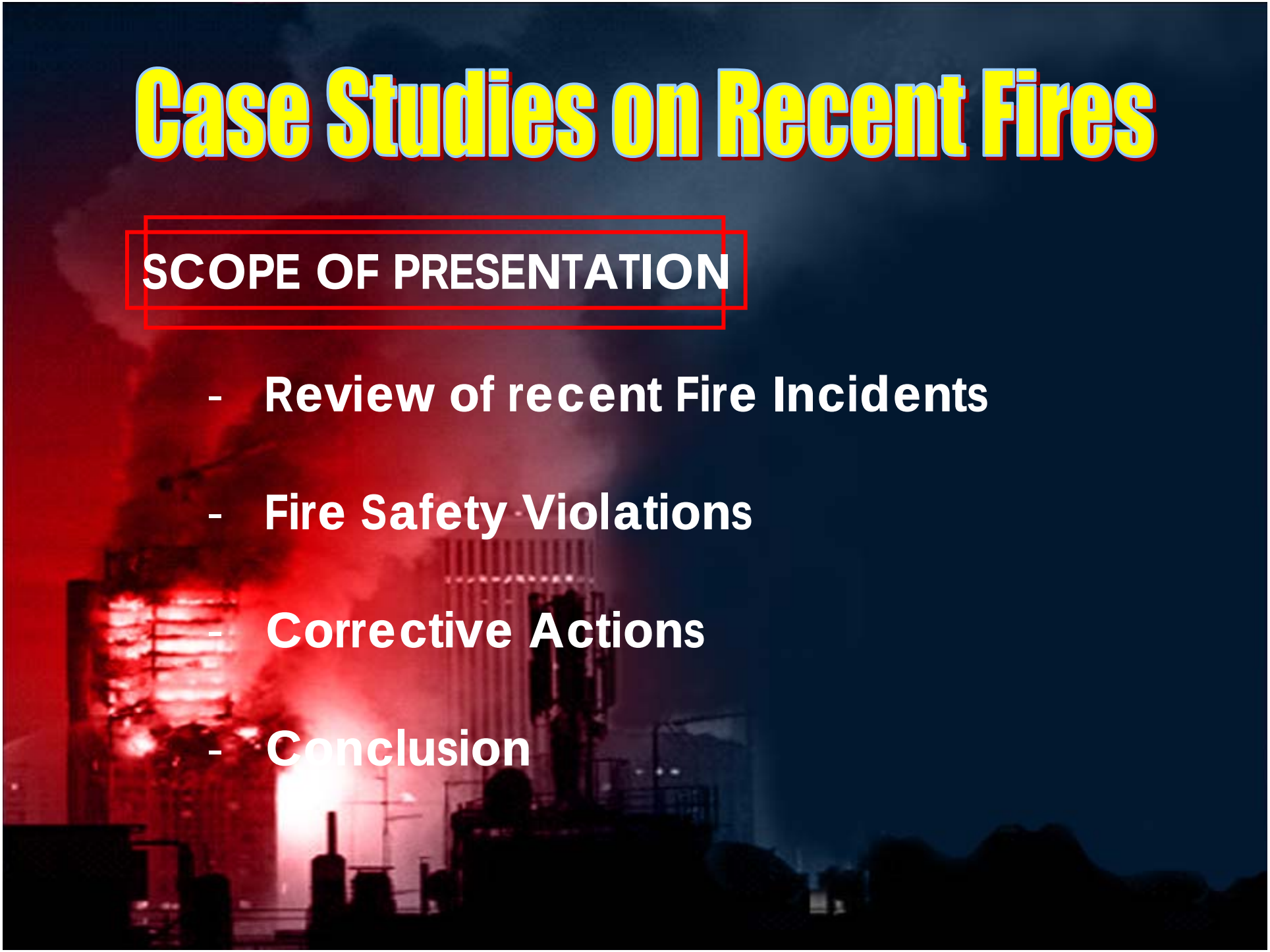


Case Studies on Recent Fires


Case Studies on Recent Fires
SCOPE OF PRESENTATION
- Review of recent Fire Incidents
- Fire Safety Violations
- Corrective Actions
- Conclusion


Case Studies on Recent Fires
Case No 1

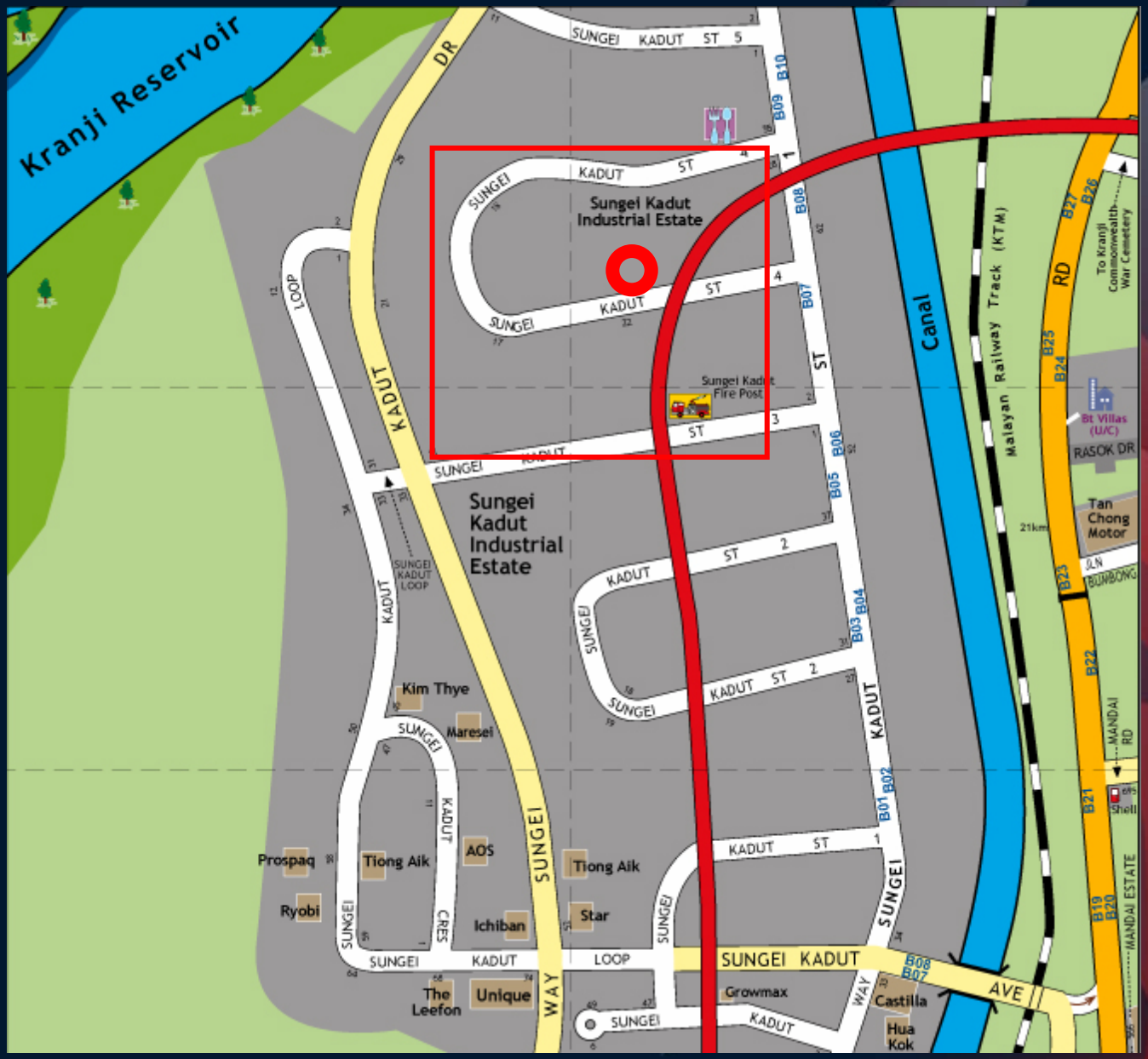
Timber Factory @ Sungei Kadut Street 4

1 Dec 2007 @ 10:02 HRS

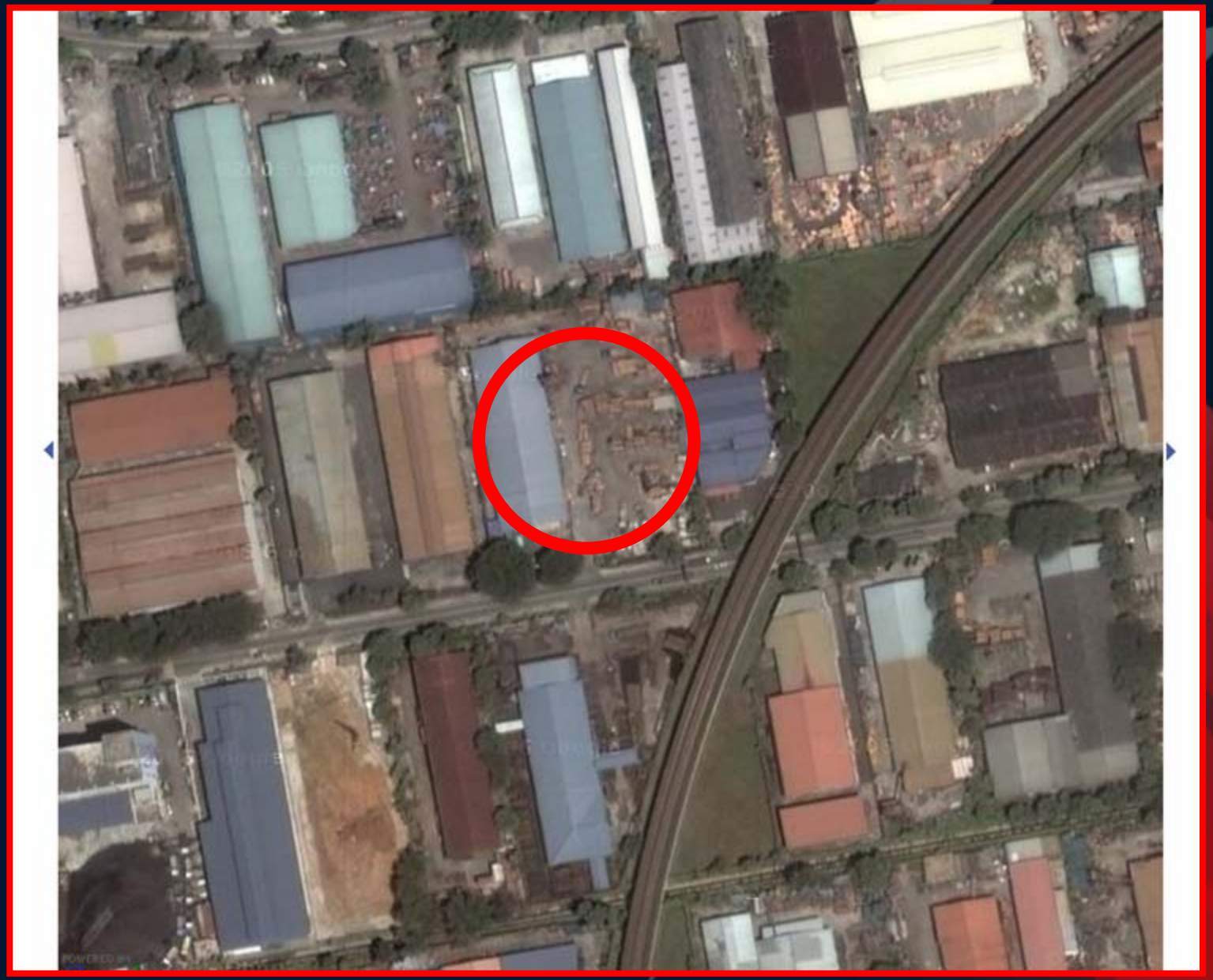


Location Map

Timber Factory
Sungei Kadut Street 4



Satellite Picture Taken at least 3 yrs back



Changes :

1. New Office Building
2. Green Canvas Sheet Extension to Fence



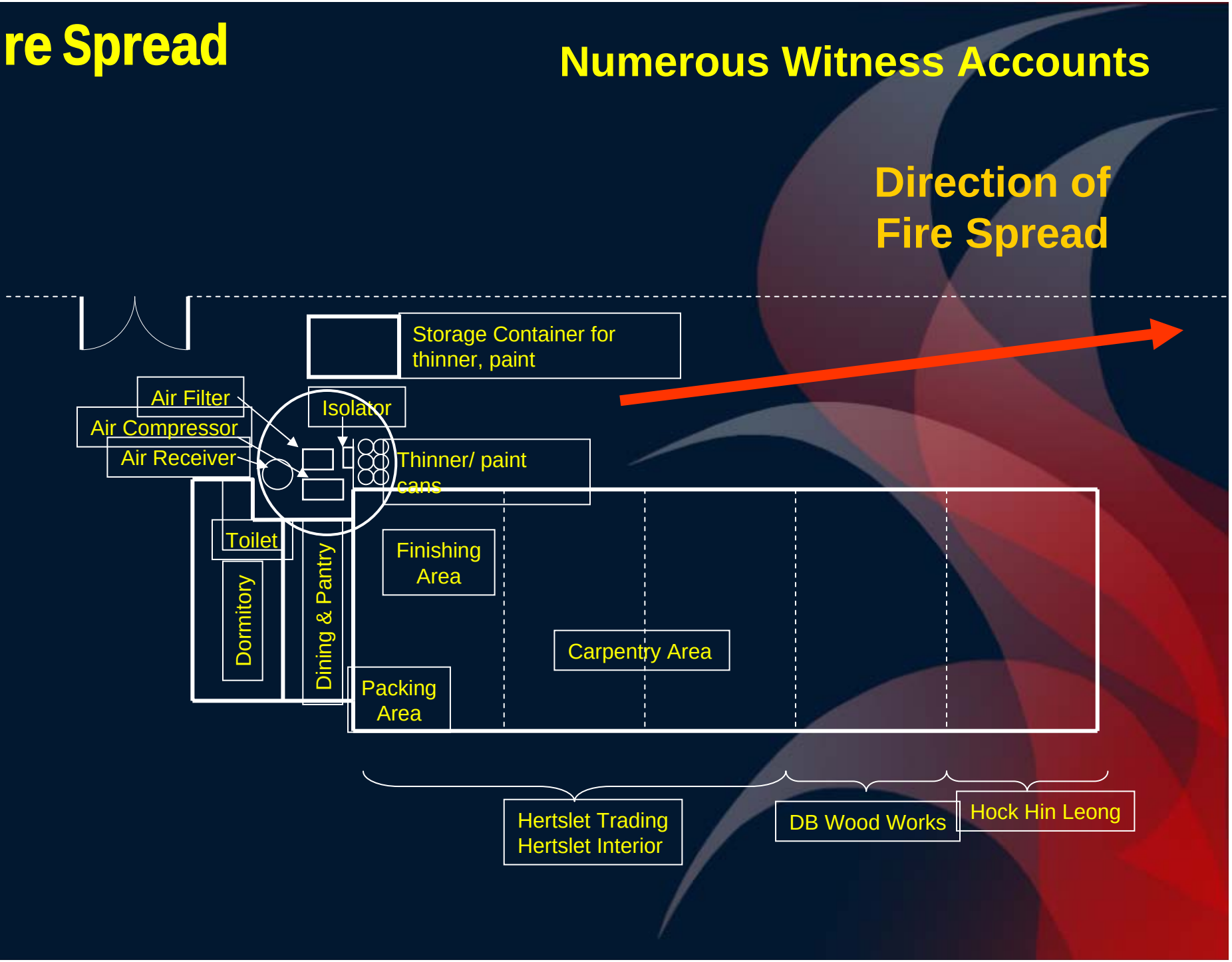
Timber Factory @ Sungei Kadut Street 4

1 Dec 2007 @ 10:02 HRS



Fire Spread

Numerous Witness Accounts



Fire Spread

Possible Causes for Rapid Spread

1. Large amounts of thinner/paint residue on all surfaces in the area.

Illegal extension to the perimeter fence

– Green Canvas over these metal bars



Fire Spread

Intense heat ignited goods in adjacent unit



Opened Sections to facilitate movement of goods



Fire Spread



No goods along this section of the access way





Goods and machines found along access way



Origin of Fire

CCTV footage (Opposite Unit @09:53:55)



Fire at rear, around compressor set area.

Origin of Fire

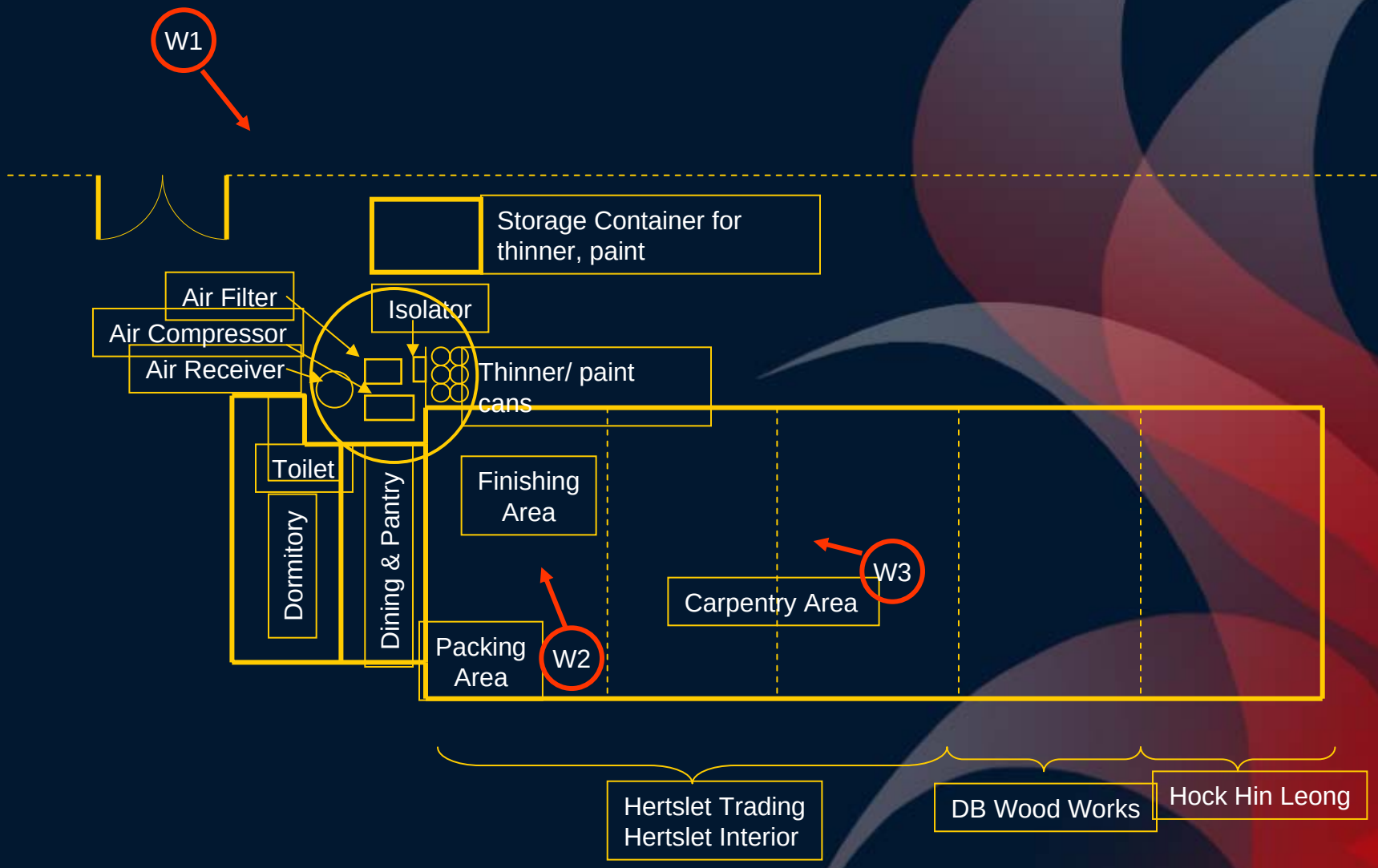
CCTV footage (Opposite Unit @09:54:00)



Heavy smoke all round this edge of the building in the next 5 seconds

Origin of Fire

Numerous Witness Accounts



Timber Factory @ Sungei Kadut Street 4

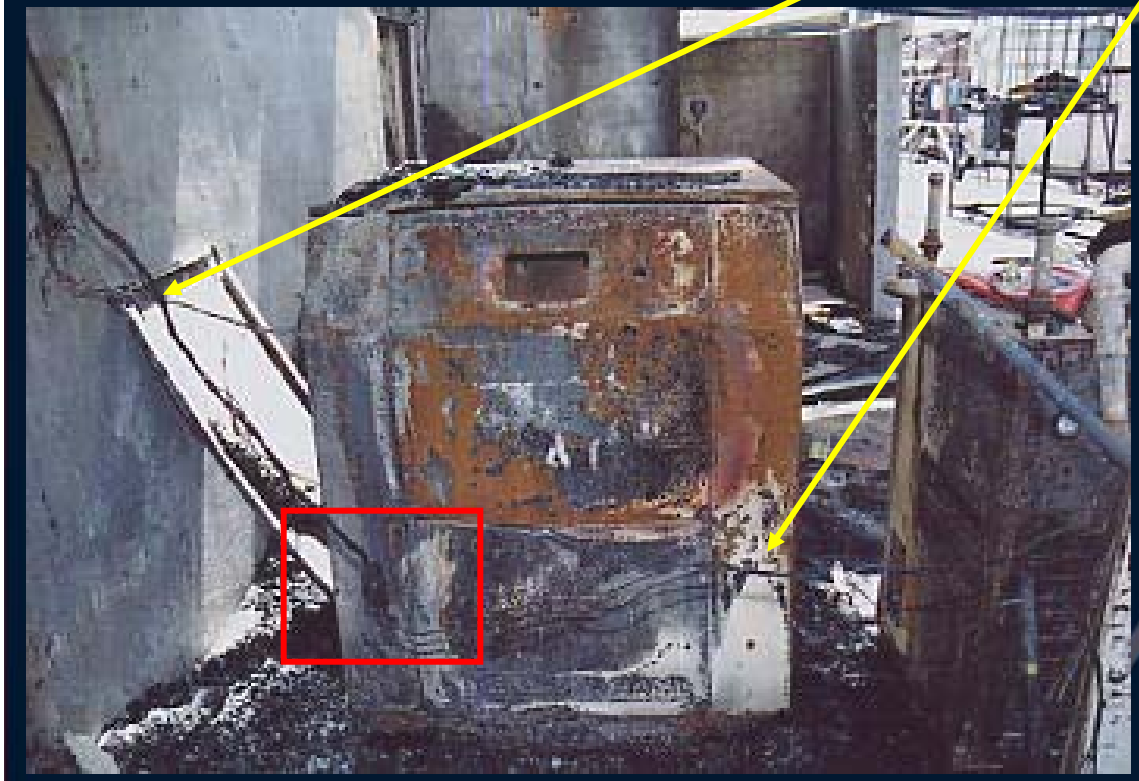
1 Dec 2007 @ 10:02 HRS



Cause of Fire

Isolator (Switch) of Compressor Set

Stretch of wire and isolator (switch) recovered from amongst the debris here.



Wires placed back to near-original positions.

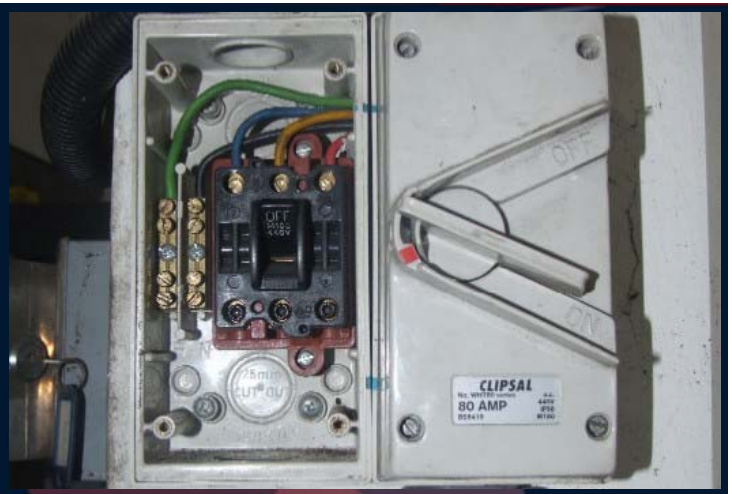




A similar isolator

Cause of Fire

Isolator (Switch) of Compressor Set



Other facts on isolator gathered through interviews:

1. **Compressor stopped on 29/11, Thur late afternoon.**

2. **Compressor contractor arrived on 30/11, Fri morning and identified fault with isolator. Slight burnt marks and melting of internal connection.**

3. **Replaced with another similar, 2nd hand, isolator. Operations resumed for the rest of the day.**

4. **Fire occurred on the next morning, 1/12.**

Timber Factory @ Sungei Kadut Street 4

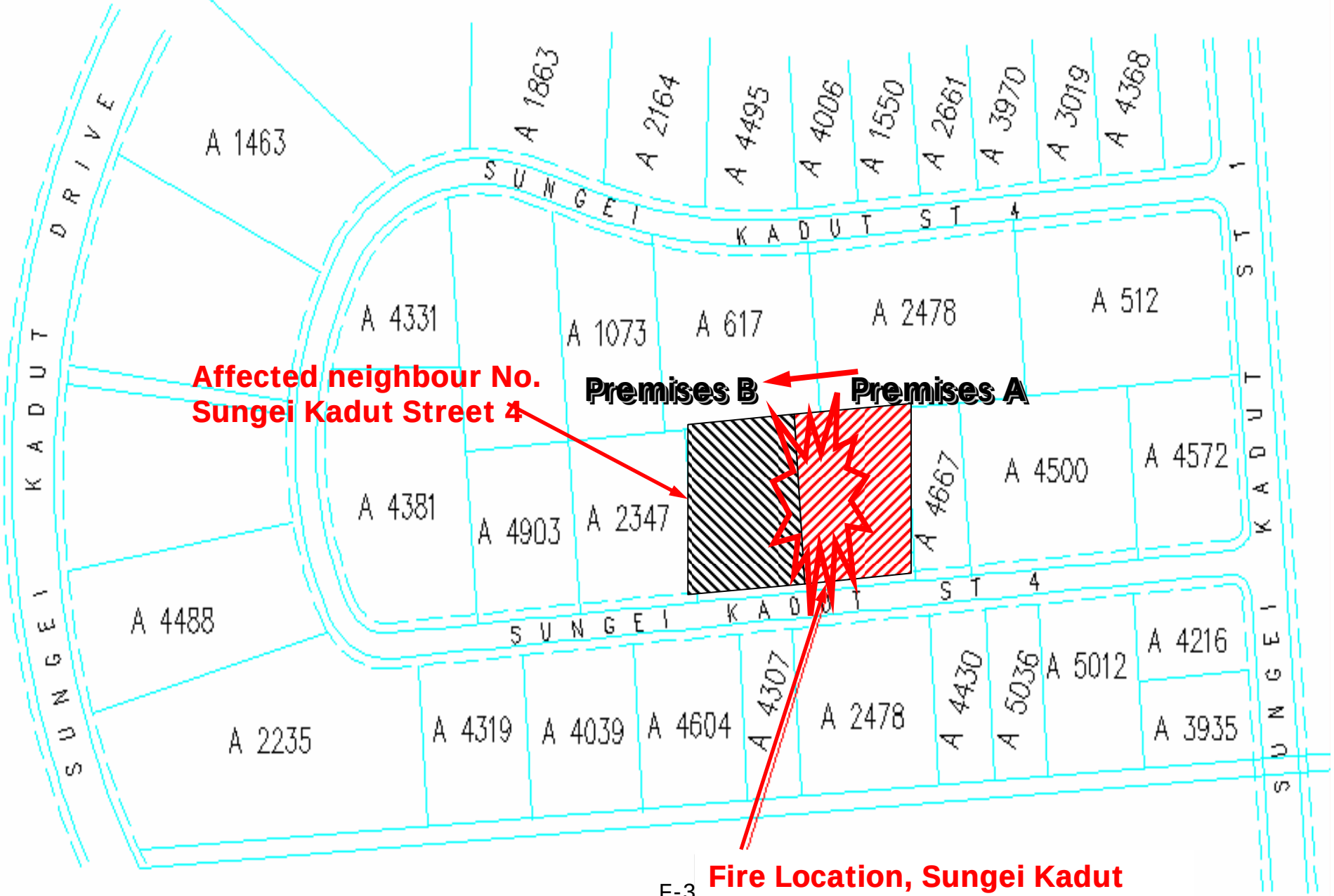
1 Dec 2007 @ 10:02 HRS



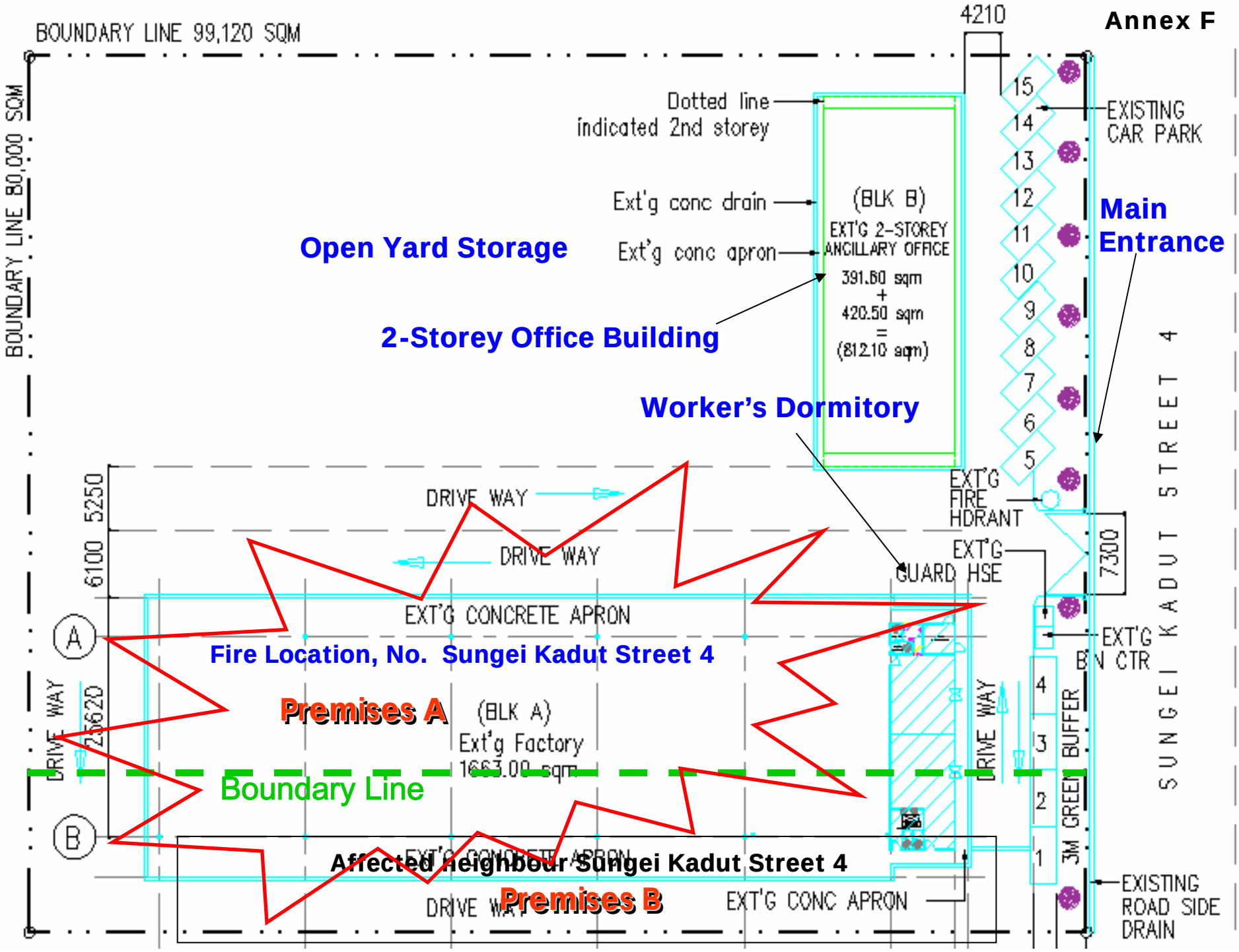
FIRE SAFETY APPROVAL AND CERTIFICATIONS

- Change of use from existing factory to worker's dormitory approved on 24/10/05
- FSC rejected on 22/06/06 due to
  - ✓ RI report was not submitted
  - ✓ No fire separation between worker's dorm & existing factory
- QP furnished RI report on 18/07/06
- FSC issued on 19/07/06
- Partitioning works of office building approved on 19/01/07; no FSC obtained
- Plan submission for no. Premises B (affected neighbour) not in order

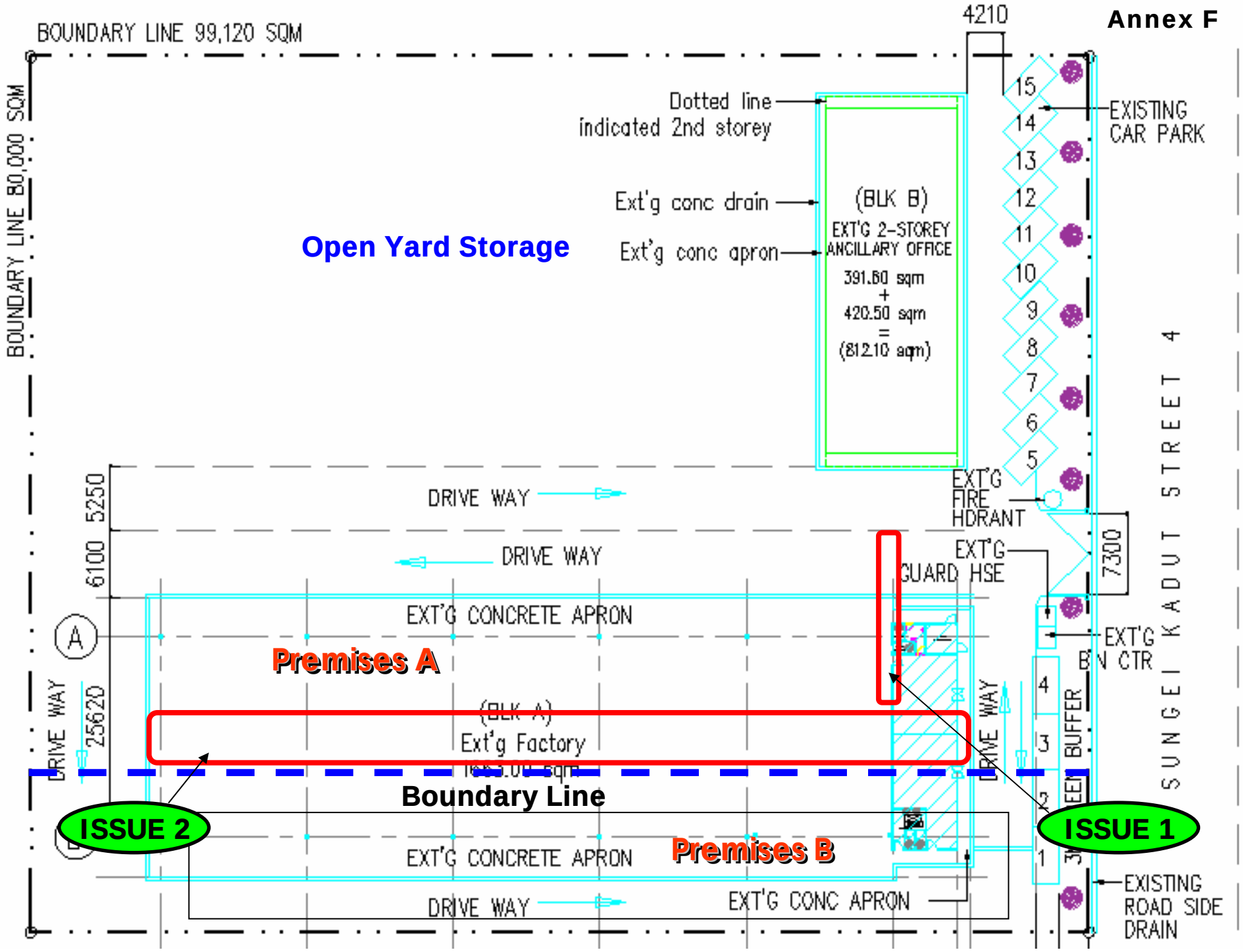
ILLUSTRATIONS OF FIRE SAFETY ISSUES



Annex F


BOUNDARY LINE 99,120 SQM
BOUNDARY LINE 80,000 SQM
4210
Dotted line indicated 2nd storey
Ext'g conc drain
Ext'g conc apron
(BLK B)
EXT'G 2-STOREY ANCILLARY OFFICE
391.60 sqm + 420.50 sqm = (812.10 sqm)
Open Yard Storage
2-Storey Office Building
Worker's Dormitory
Main Entrance
EXISTING CAR PARK
15
14
13
12
11
10
9
8
7
6
5
EXT'G FIRE HDRANT
EXT'G GUARD HSE
7300
DRIVE WAY
DRIVE WAY
6100
5250
EXT'G CONCRETE APRON
A
B
Fire Location, No. Sungei Kadut Street 4
Premises A
(BLK A)
Ext'g Factory
1663.00 sqm
Boundary Line
DRIVE WAY
23620
DRIVE WAY
EXT'G BIN CTR
4
3
2
1
3M GREEN BUFFER
SUNGEI KADUT STREET 4
Affected neighbour Sungei Kadut Street 4
Premises B
DRIVE WAY
EXT'G CONC APRON
EXISTING ROAD SIDE DRAIN

Annex F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EXT'G FIRE HDRANT
EXT'G GUARD HSE
7300
DRIVE WAY
DRIVE WAY
6100
5250
EXT'G CONCRETE APRON
A
Premises A
DRIVE WAY
25620
(BLK A)
Ext'g Factory
Boundary Line
ISSUE 2
ISSUE 1
EXT'G CONCRETE APRON
Premises B
DRIVE WAY
EXT'G CONC APRON
EXT'G BIN CTR
4
3
2
1
BUFFER
SUNGEI KADUT STREET 4
EXISTING ROAD SIDE DRAIN

ENFORCEMENT FINDINGS

Premises A

- No FSC for extensions to existing factory and the partition works in office building
- No proper fire separation between dormitory and existing factory
- Indiscriminate stacking of timber and woods along perimeter fencing and fire engine accessway
- Improper storage of flammable liquids

ENFORCEMENT FINDINGS

Premises B

- Indiscriminate stacking of timber and woods along perimeter fencing and fire engine accessway

FOLLOW-UP ACTIONS

- Owner to regularise all non-compliances
- Actions may be taken against QP and RI pending outcome of investigations via
  - ACC
  - RI inquiry panel

LESSON'S LEARNT

- QP could play a more active role when discover the existence of fire hazard.
- Any alteration works shall be approved prior to its erection.
- Works carried out shall comply to conditions stipulated in the approved plan.
- RI needs to be more vigilant in carrying out inspections.



No proper fire separation between dormitory and factory

BACK



Single storey extension of factory over driveway

BACK



Boundary line between no. 6 and no. 8 Sungei Kadut St. 4

NEXT



View from no. 8 Sungei Kadut St. 4 of the boundary

NEXT

Annex F



View from no. 8 Sungei Kadut St. 4 of the boundary

BACK



Existing 2-Storey Office Building (MRT line running beside building)

BACK



Front view worker's dormitory

BACK



Open Yard Storage

BACK

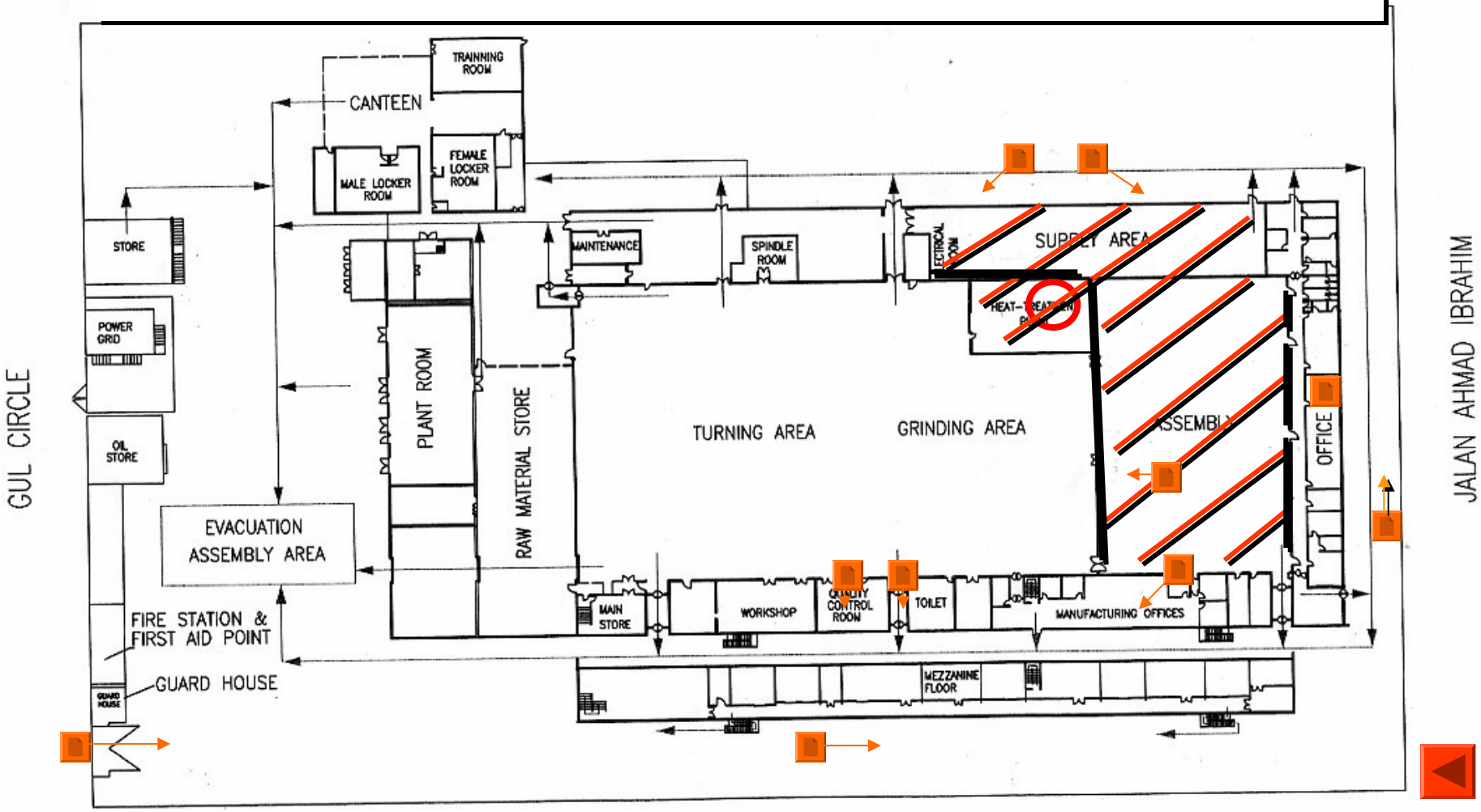
Case Studies on Recent Fires

Case No 2

Fire Incident at Gul Circle on 11 April 08



Fire Incident at Gul Circle on 11 April 08



Fire Incident at Gul Circle on 11 April 08



Entrance to Factory Premises

Fire Incident at Gul Circle on 11 April 08



Access to Factory Premises

Fire Incident at Gul Circle on 11 April 08



Access to Factory Premises

Fire Incident at Gul Circle on 11 April 08



Access to Factory Premises

Fire Incident at Gul Circle on 11 April 08



Access to Factory Premises

Fire Incident at Gul Circle on 11 April 08



Fire door separating factory and office

Fire Incident at Gul Circle on 11 April 08



Fire separating wall separating factory and office

Fire Incident at Gul Circle on 11 April 08



Minor heat and smoke damages to the manufacturing office

Fire Incident at Gul Circle on 11 April 08



Connecting door from production area to ancillary building

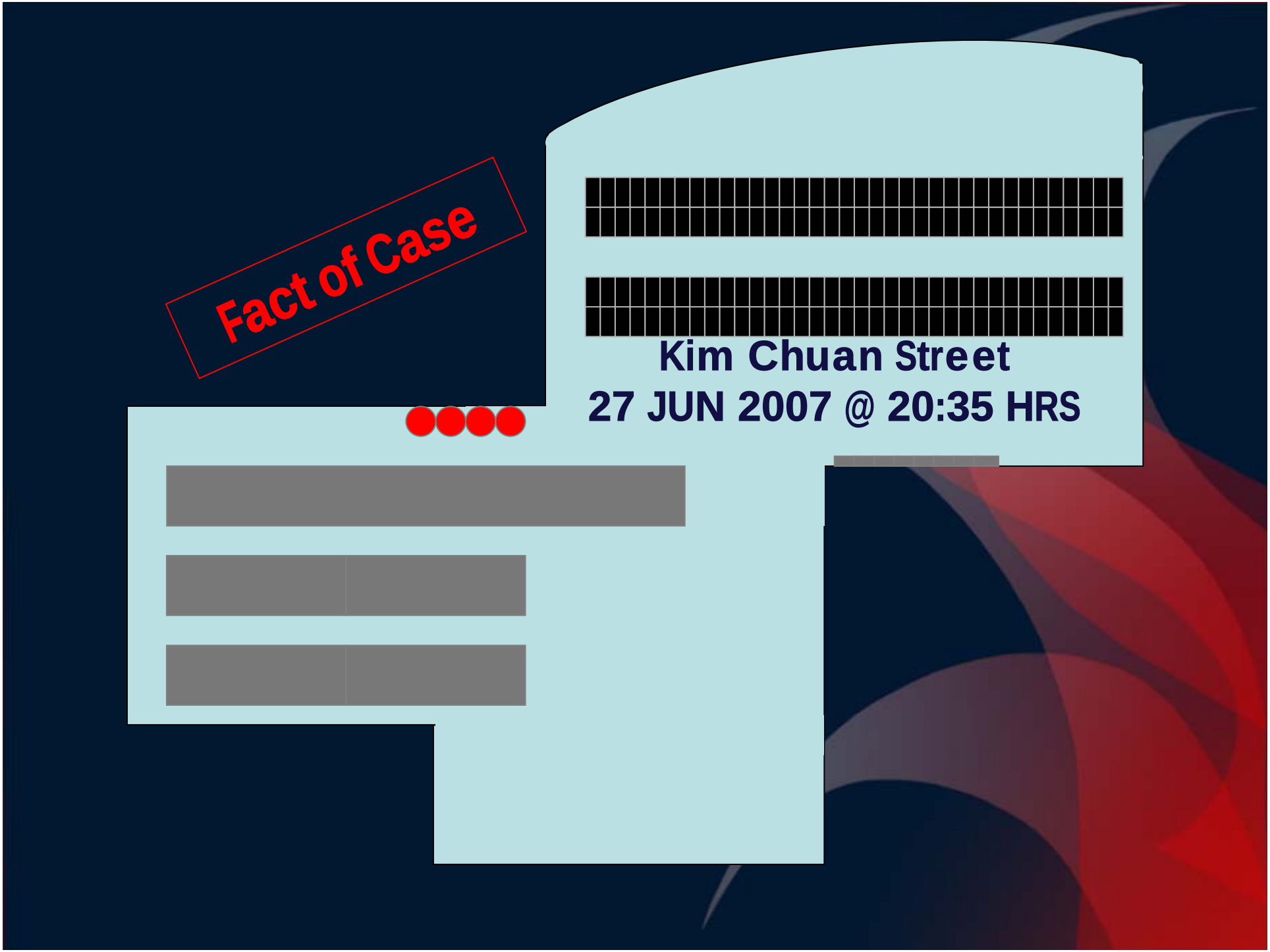
Fire Incident at Gul Circle on 11 April 08



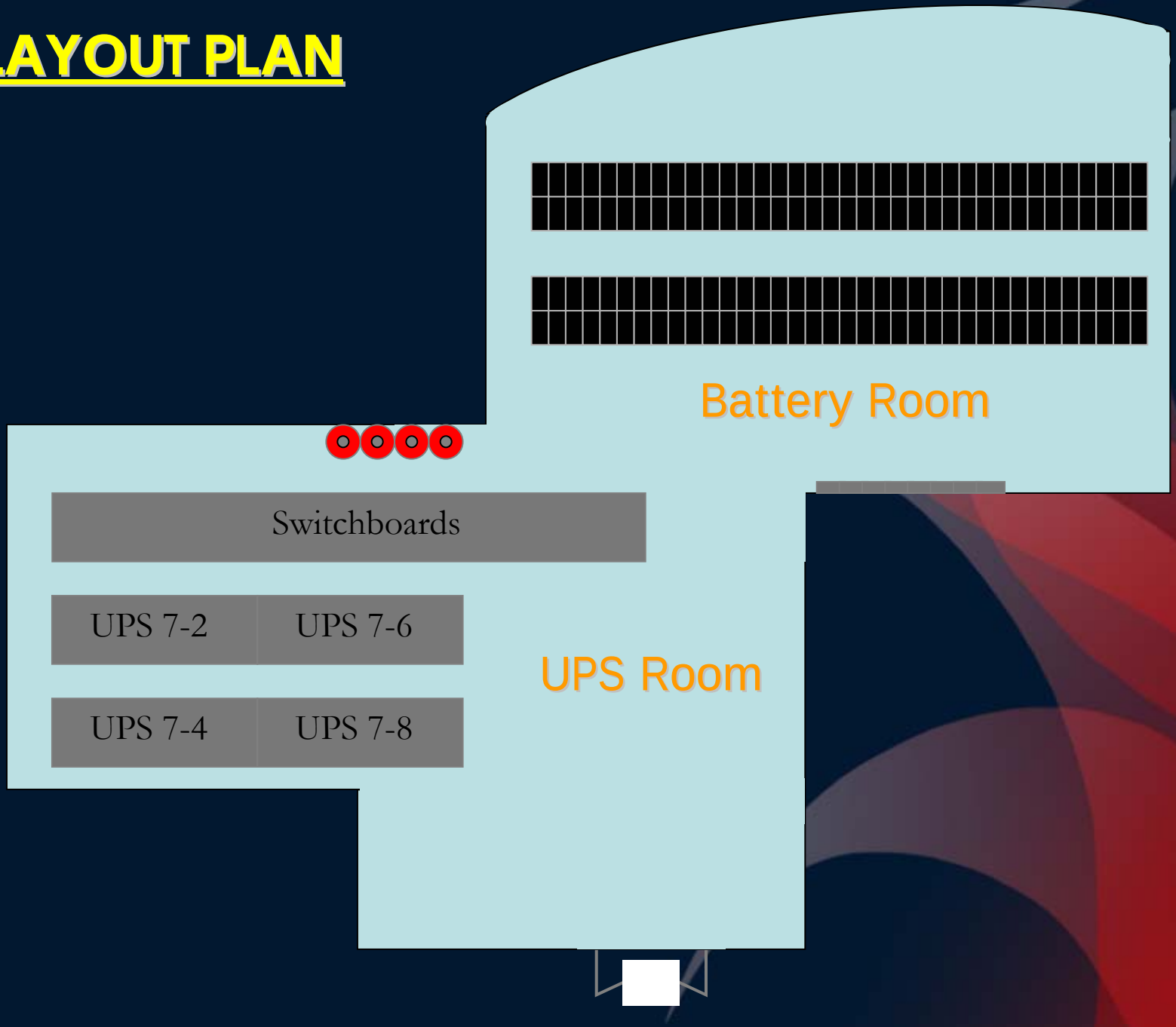
No damages to the ancillary building

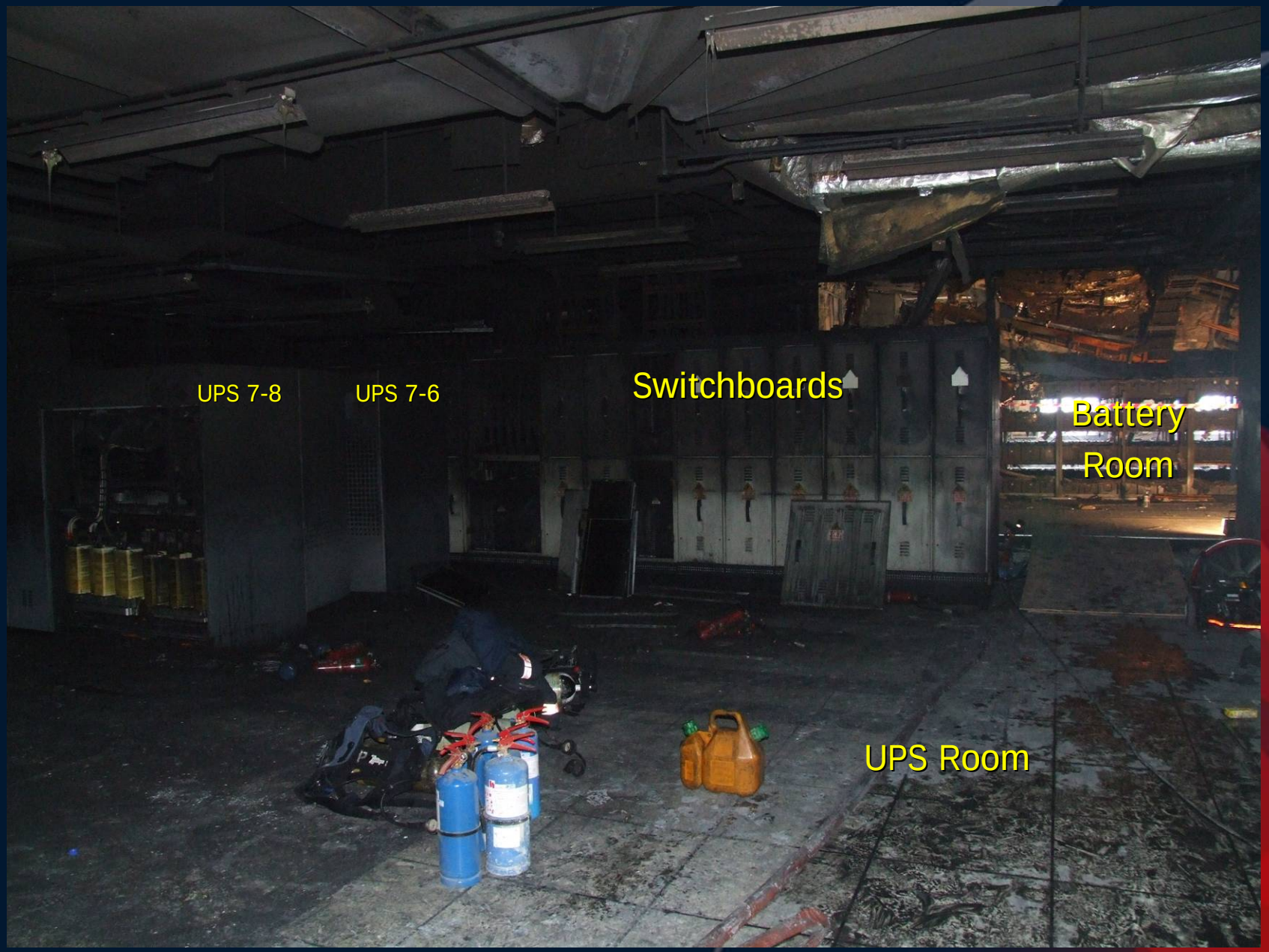
Case Studies on Recent Fires

Case No 3


Fact of Case
[redacted]
[redacted]
Kim Chuan Street
27 JUN 2007 @ 20:35 HRS
[redacted]
[redacted]
[redacted]

LAYOUT PLAN

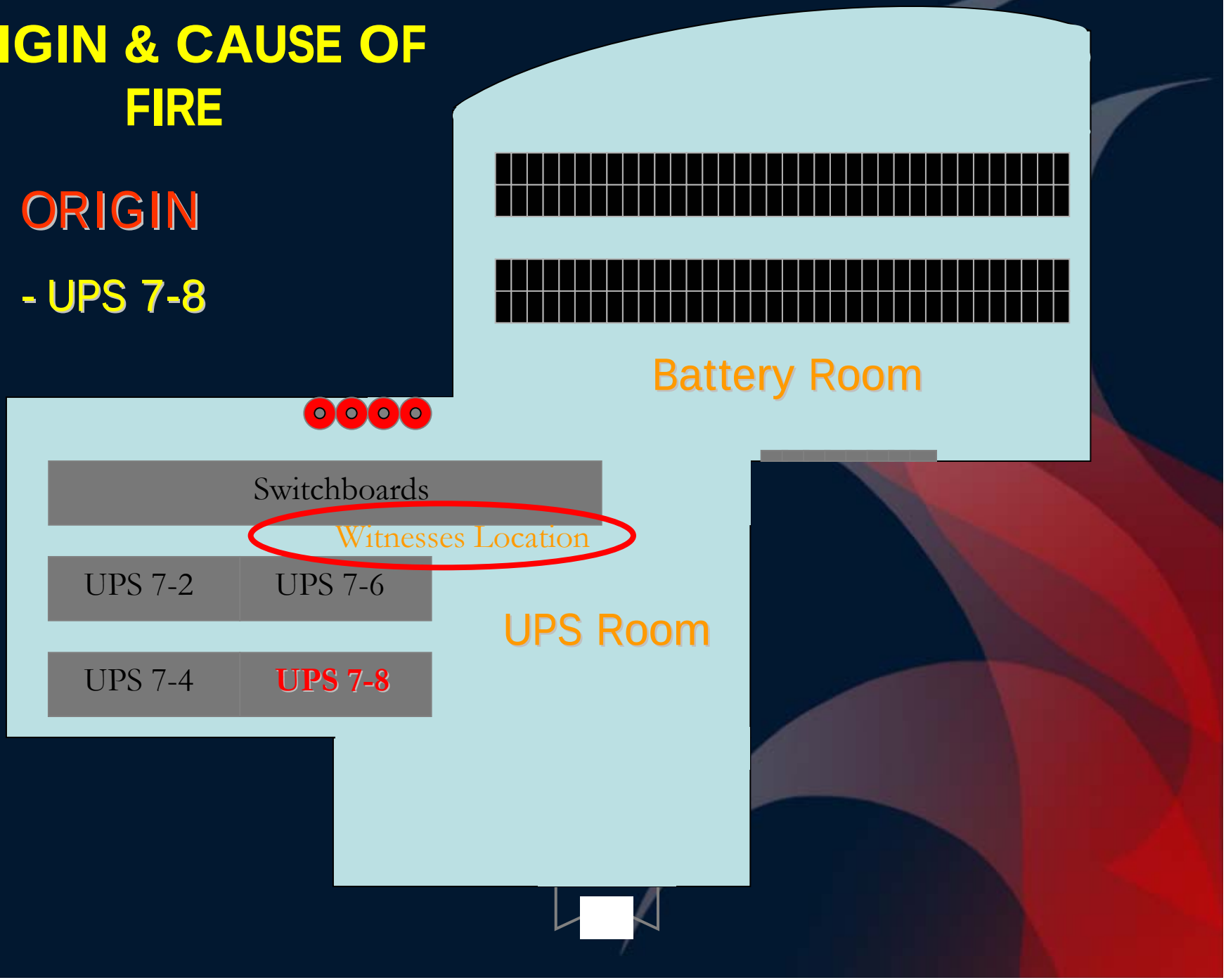

Battery Room
Switchboards
UPS 7-2
UPS 7-6
UPS 7-4
UPS 7-8
UPS Room


UPS 7-8
UPS 7-6
Switchboards
Battery Room
UPS Room

ORIGIN & CAUSE OF FIRE

ORIGIN

- UPS 7-8



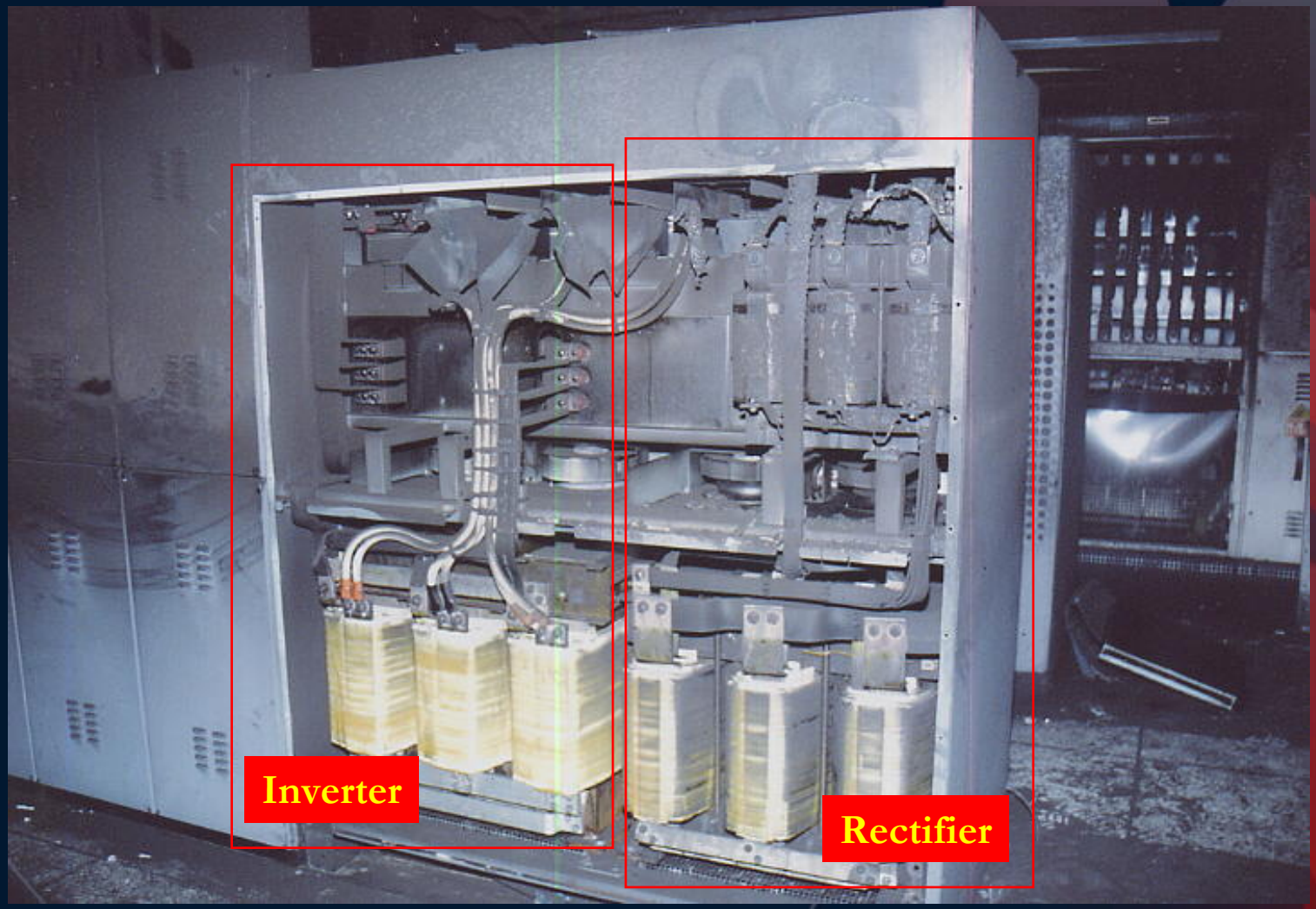
- 20 mins prior to the fire.
- Thermographic (Infrared) Inspection for contact points.



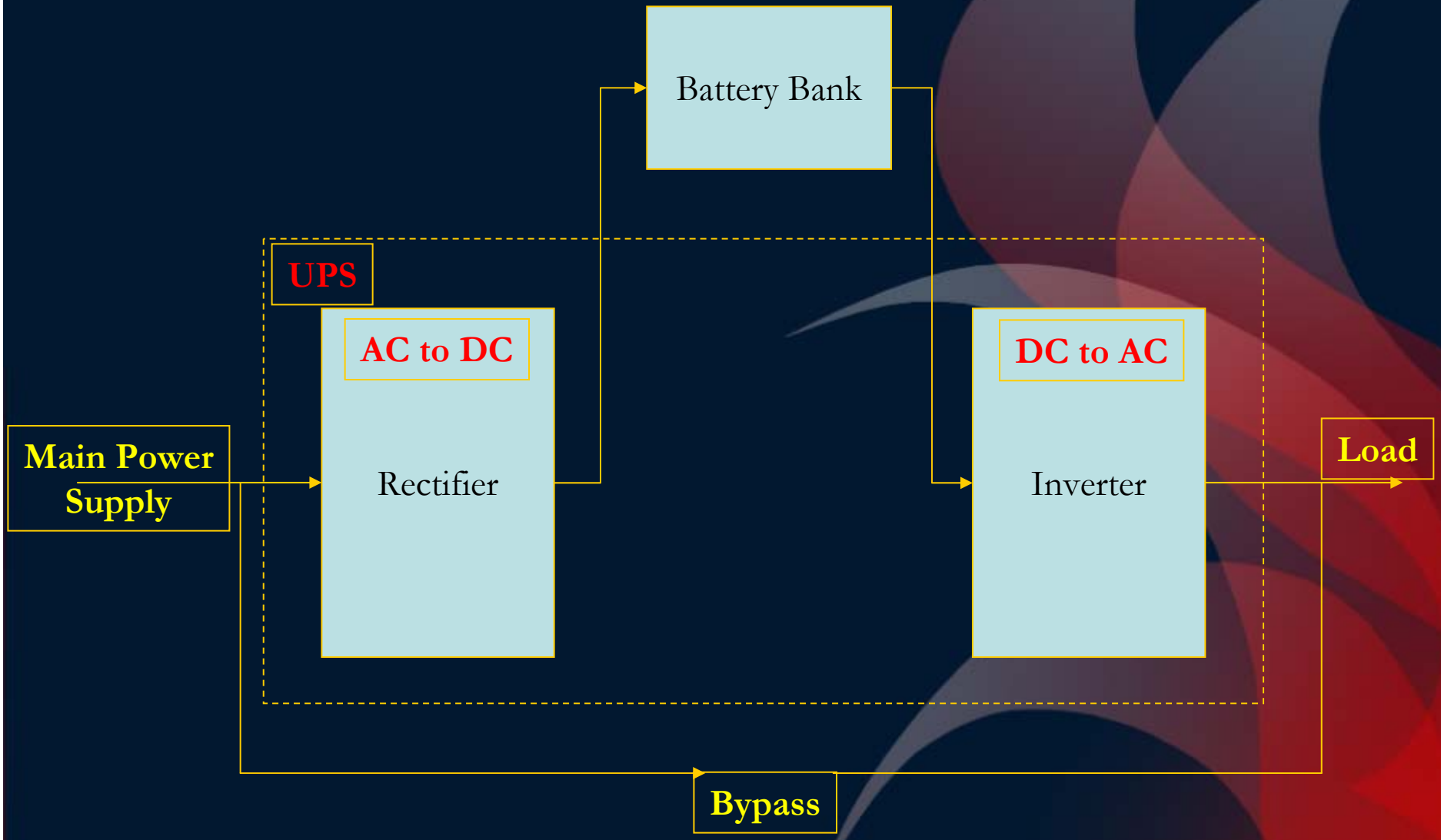
- Immediately after the UPS ‘Explosion’.
- Prior to the fire at the battery room.



- Internal view of UPS 7-8.
- Rectifier (AC to DC converter).
- Inverter (DC to AC converter).



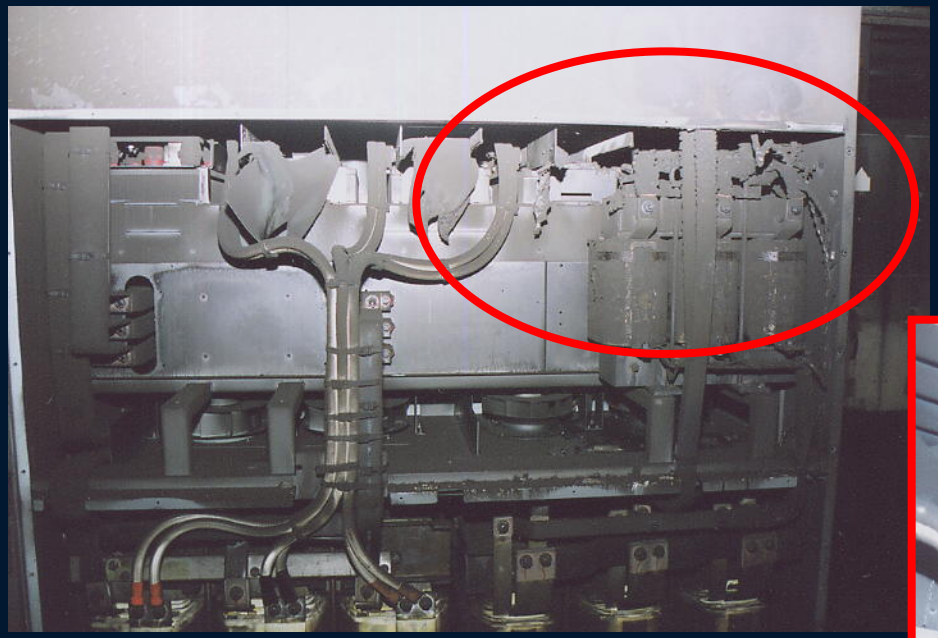
Uninterruptible Power Supply (UPS).

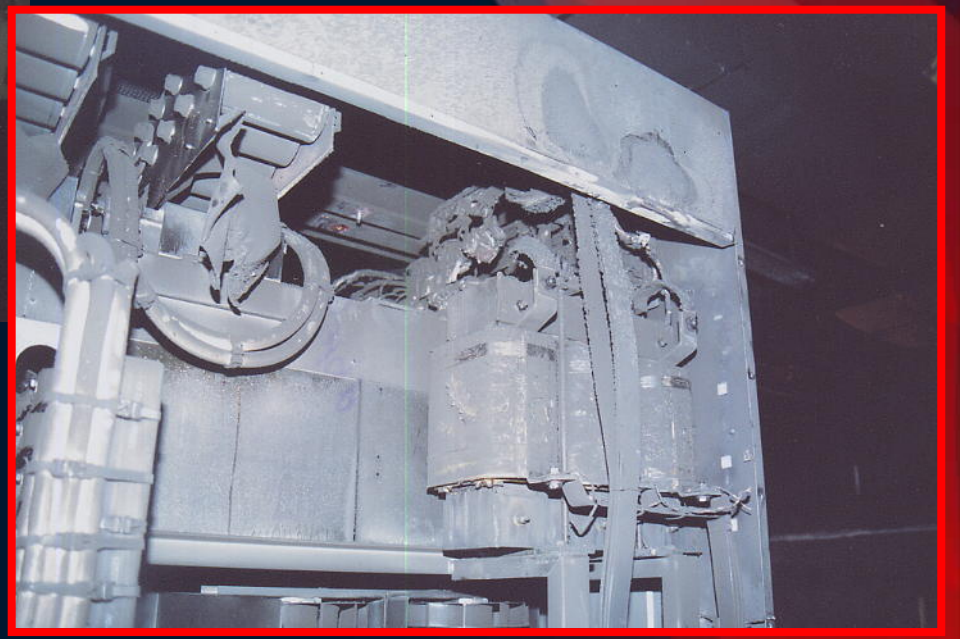


ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE

- Electrical components failure at UPS 7-8

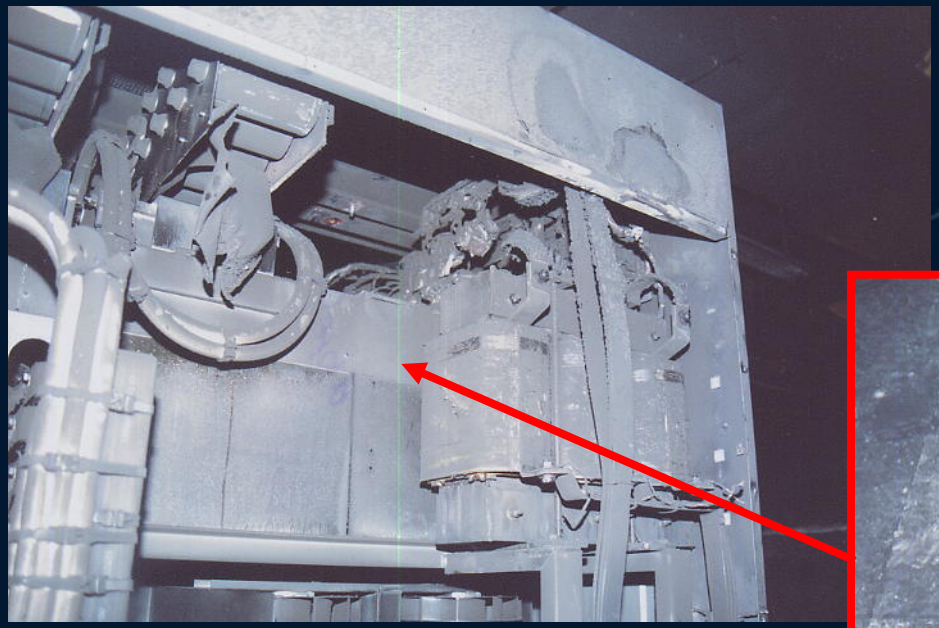


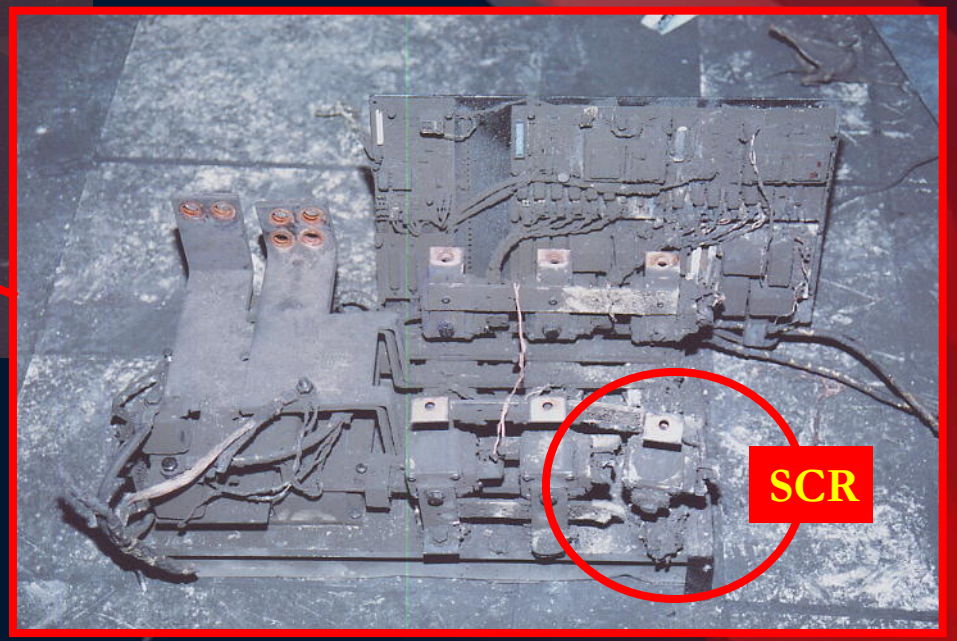


ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE

- Silicon Control Rectifier (SCR) ruptured.

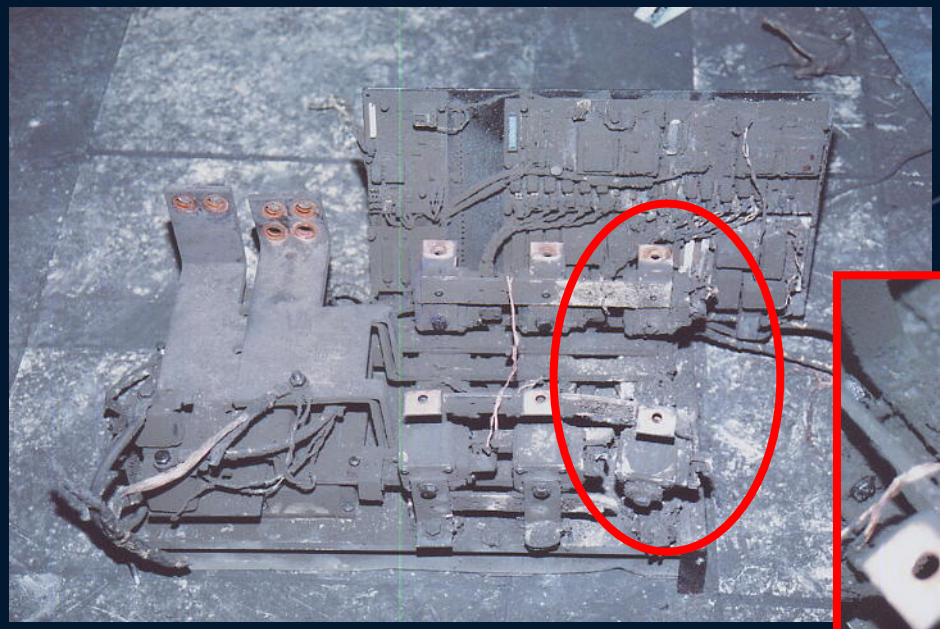


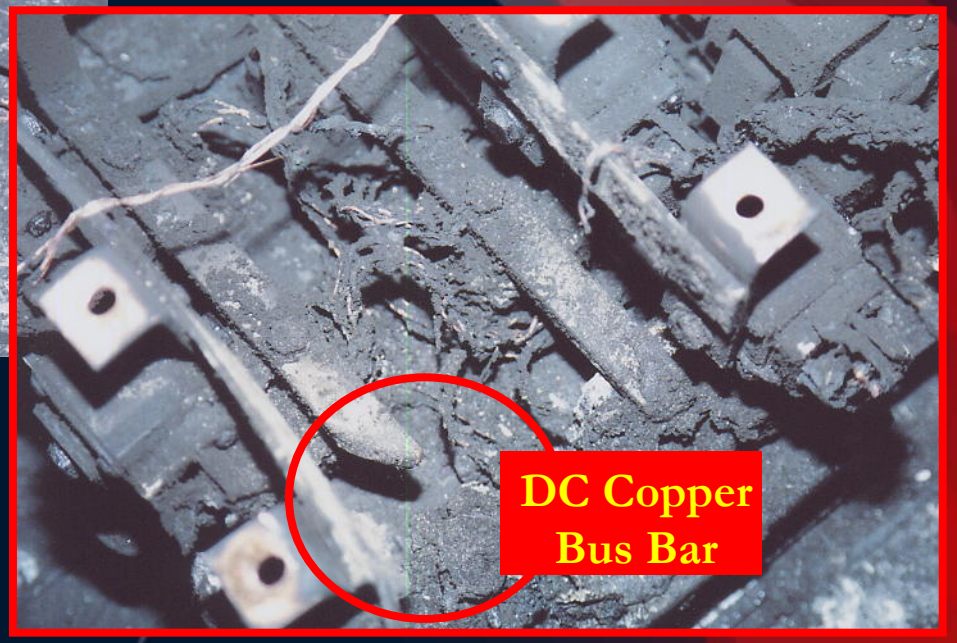


ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE

- DC Copper Bus Bar ruptured.

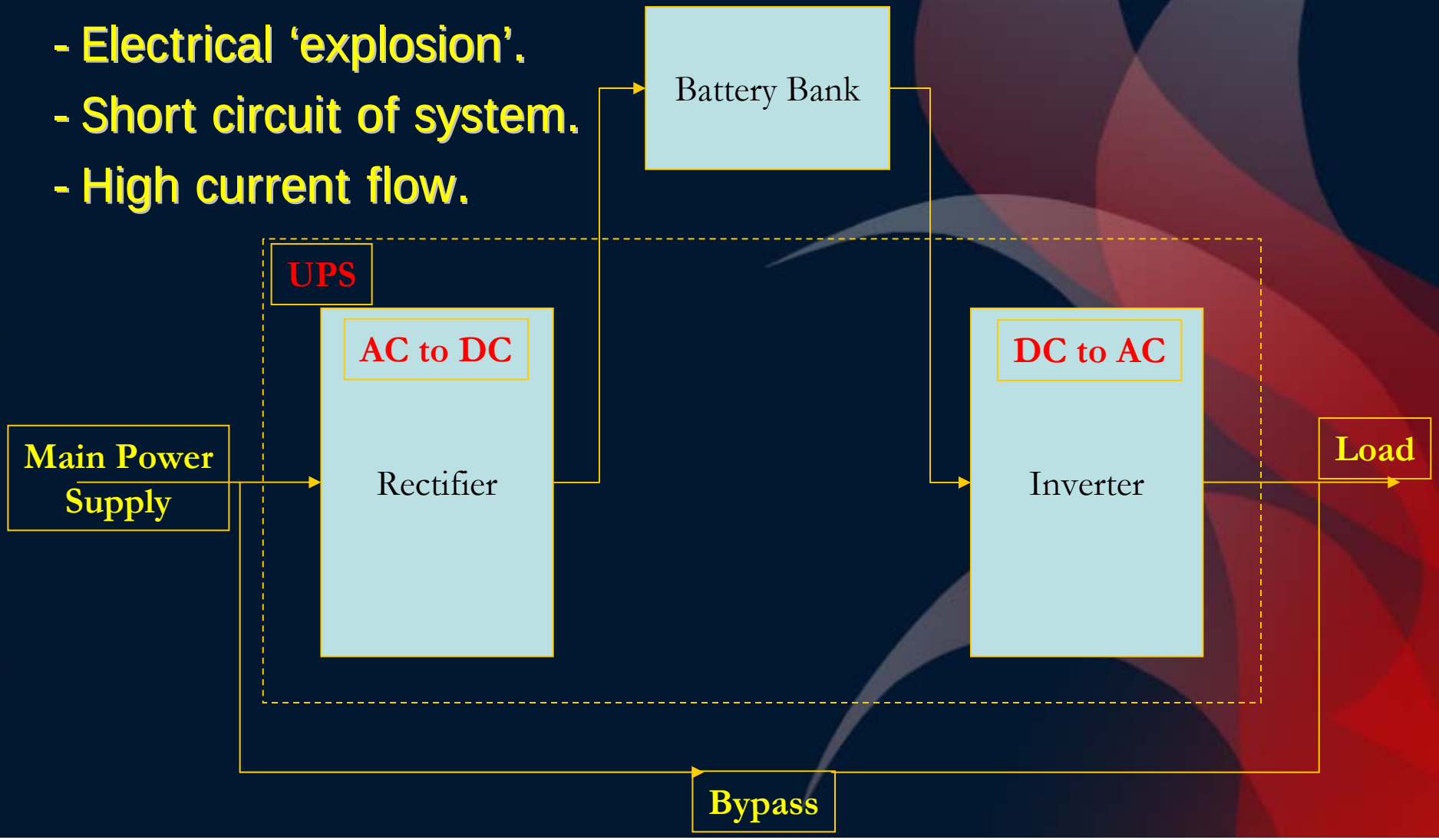




ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE

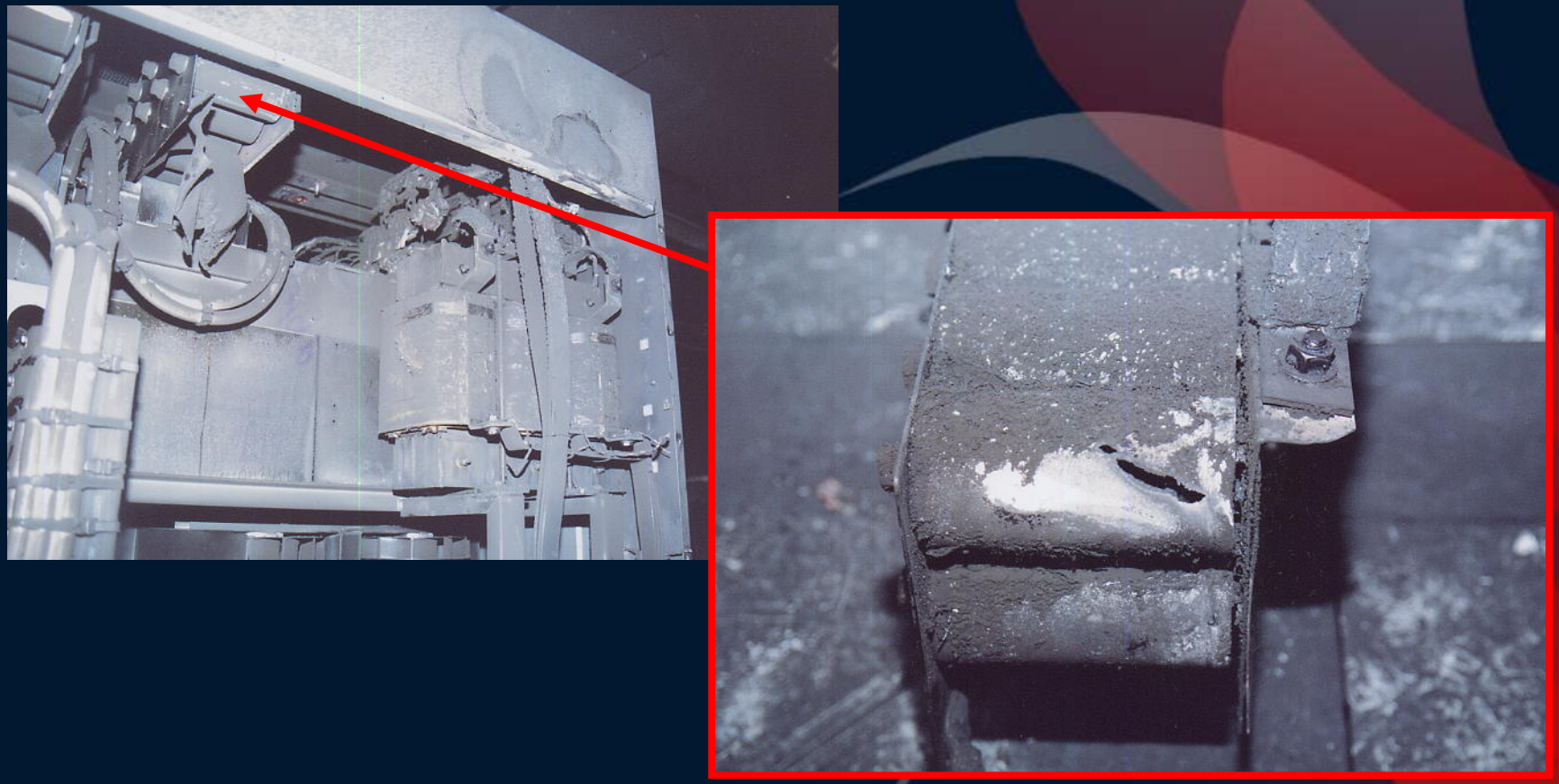
- Electrical 'explosion'.
- Short circuit of system.
- High current flow.



ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE

- Inverter Capacitor burst/'exploded'.



ORIGIN & CAUSE OF FIRE

CAUSE OF FIRE (Battery Room)

- Explosion of batteries 2-3 seconds later.





Fire Safety Violations

(1) FM 200

The FM 200 could not be activated at the time when the fire incident broke out as it was not armed. The fire could have been extinguished at its early stages and within a shorter time frame if the FM 200 was in working condition.

(2) Fire Safety Violation

The following are some of the fire safety violations observed for this incident:

(a) A fire hydrant at the 1st storey level near exit discharge of staircase number 3 was found obstructed by a generator set;

Fire Safety Violations– continued.....

(b) Combustible materials were found placed near the exit discharge at staircase number 3;

(c) The sprinkler protection for the Battery/UPS room was removed by the Qualified Person (QP) without prior approval; and

(d) The building management had failed to obtain a Fire Safety Certificate for fire safety works that had been carried out and completed at the 7th storey level.

Conclusion

All QP and RI has an important role to play

- **Fire prevention**

The strength of the QP and RI is maintained with close partnership with SCDF

Close partnership – enhanced fire safety


Thank You