Building Name Address	Use (as per FSA Annexed Table 1)	Date and Time of Incident	Structure and Stories Area	Extent of Damage (Damaged Area/ Total Area)	No. of Casualties
Shuwa Mejirodai Residence 1210 Kunugidamachi, Hachiohji ,TOKYO	Apartment building (5) b	Nov. 23, 1975 Breakout at 02:07 (approx.) Noticed at 02:12 Notified by emergency call Extinguished by 04:22	Fire resistive 11 stories above ground and 0 below Building area 2,409.04 m^2 Total floor area 25,702.86 m^2	All, Half, Partial, Small 314 m^2 (1.2%)	Fatalities 2 Injured 19 (2)

I. Summary of Fire Incident

(1) Summary

Around 02:00, there was an explosion in Room 614 on the 6th floor of the apartment building. Because of the impact of this explosion, the floors of the 6th and 7th floor crumbled into the 5th floor and fire spread to these floors instantly. The blast wave also deformed the doors of other rooms. This fire resulted in 19 injuries and 2 fatalities, including 1 fatality on the top floor (11th floor). This fire-resistive apartment building was constructed by the HPC method in the shape of a U that had two wings extended from the north side of the main portion.

(2) Conditions per Floor

Floor	Total area	Damaged area	Use (Purpose)	No. of persons	No. of fatalities	Fire escape equipment	Firefighting equipment
	m^2	m^2				2 sets of outside escape stairs	Emergency alarm system (Bell) Water pipe connections Emergency equipment Fire extinguishers Water outlet
RH	73.62						
11	2,322.02		Apartment house		1		
10	2,322.02		〃				
9	2,322.02	62.7	〃				
8	2,322.02		〃				
7	2,322.02	62.7	〃		1		
(6)	2,322.02	125.4	〃				
5	2,322.02	62.7	〃				
4	2,322.02		〃				
3	2,322.02		〃				
2	2,322.02		〃				
1	2,409.04		〃				
Total	25,702.86	313.5			2		

(3) Origin of Fire

(Floor, Room, Part, Combustibles, Habitable/Non-habitable Rooms, Present/Absent)

From Room 614 in Building B

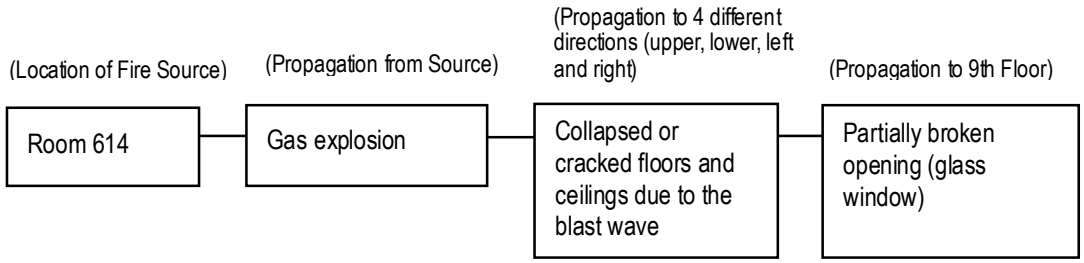
One male occupant (age 31) was in this 3-bedroom unit when the fire broke out. The rooms were constructed with a wooden frame and fabric-wallpapered plywood.

(4) Cause of Fire

Gas explosion (utility gas)

Presumably, the occupant connected the hose of a portable gas burner to the outlet to cook *Sukiyaki*, but he decided to stop because he did not have enough ingredients. He unplugged the hose from the outlet and he thought that he closed the valve at that time. However, he actually turned the valve the wrong way, leaving the valve "open" after he went to bed. As a result, some fire source ignited the leaked gas causing the explosion.

(5) Fire Propagation Path



Because of the explosion, the floor and ceiling of the eat-in kitchen collapsed completely and the units directly above and below the fire unit were engulfed in flames. The fire spread to both units on the left and right side of the fire unit because the blast brought down or cracked the walls. From the 6th to 9th floors, the flames that emerged from each room to the outside balcony became one large flame and formed into an arch. Because of this shape, the fire jumped across the 8th floor and ignited a unit on the 9th floor.

○ Main Reasons for Propagation of the Fire
- The explosion caused the walls, ceilings, and floors to collapse.
- After the leaked gas ignited, fire spread instantly. The residual gas in the gas line also leaked eventually and facilitated the fire spread.
- Because of the unique shape of the building, the fire room was located in a blind spot. Because of this, the firefighters had difficulty in spraying water and controlling the fire effectively at first.

○ Smoke Propagation Path
- Along with the fire, smoke traveled through the collapsed portions of the floor, ceiling, wall, and broken glass window.

II. Summary of the Building

(1) Built

Construction, Completion, and Major Renovations
(Building confirmation) October 20, 1971 (Inspection upon completion) January 19, 1973

Fire Prevention Management

(2) Vertical Shafts

Stairwell	[X]	Duct space	[ ]
Elevator	[X]	Pipe Shafts	[ ]
Escalator	[ ]	Other ( )	[ ]

The maintenance was adequate.

(3) Fire Prevention

The building had a fire-prevention manager as required and had submitted the paper work to the local fire station.

Building management had created and submitted a fire defense plan to the local fire station.

No practical fire drills were conducted.

(4) Fire Compartments

Fire compartments for each of the units

(5) Firefighting Equipment

Good

III. Actions Taken after the Fire was Detected

(1) First Detected

- **Detected by** (The occupant and his neighbors)
- **How and why** (Sound and impact of the gas explosion)
- **Action taken** (Evacuation)

(The occupant and his neighbors instantly realized there was a fire because of the impact of the explosion)

(2) Emergency Call

Emergency Call	Yes [X] (The occupant of Room 1119 in Building B)	Time elapsed since detection ( ) minutes
	No [ ]	(Explosion)

As soon as occupant K (age 34) who was asleep in his unit, Apartment 119 of Building B, heard the blast, he instinctively thought that it was an explosion and made a 119 call from his room without looking outside.

(3) Initial Firefighting Activities

Initiated	Successful [ ] Failed [ ] ° Extinguished timing [ ] ° Firefighting difficulties [ ] ° Firefighting method [ ]	**(Reasons or Conditions)** The explosion caused the floor, ceiling, and wall to collapse and the occupant in the fire room fell to the lower floor along with the fire. This happened all at once and spread the fire, so firefighting was not the first thing residents were concerned with.
Not Initiated	° Extinguished timing [ ] ° Firefighting difficulties [ ] ° Firefighting method [ ] ° Other [ ]	

(4) Summary of Firefighting Activities

(Obstacles or Difficulties in Fire Control)

- Firefighters could not set the ladder portion of the aerial ladder truck directly onto the building because the main street was too narrow for the ladder truck to come close enough and the building layout was too unique. Therefore, it took a long time for them to set up the water firefighting activities and they eventually sprayed water from the ladder instead of attacking the fire inside directly.
- Since the cause of the fire was an explosion, people could not make effective use of the firefighting equipment, which slowed the fire control activities.
- Since the building was large and many people lived there, the lack of information confused the firefighters in their assessment of the situation.
- The firefighters had difficulty reaching evacuees because there were many rooms on each floor.

(5) Evacuation

Means of Escape (No. of Persons)	Obstacles to Evacuation
° Stairs [X] (most of the occupants) ° Elevators/Escalators [ ] ( ) ° Escape equipment [ ] ( ) ° Directly to the ground from windows or openings [ ] ( ) ° Rescued [X] (2) ° Other ( ) [ ] ( )	° No windows [ ] ° Barred openings [X] ° Locked emergency doors (Exits) [ ] ° Alarm system [ ] (Poorly controlled, Malfunctioned, Not installed) ° Power outage [ ] ° Other [ ]

Most of the occupants could exit from their units through hallways and stairs, but some occupants evacuated differently:

- ° From the window of the bathroom because the entrance door was deformed. (9 occupants in Rooms 713 and 914)
- ° From the entrance door of the neighboring unit by breaking down the partition wall on the balcony because of smoke in their own units.
- ° From the window (no iron bars) of the unit because the entrance door was deformed. (2 occupants of Room 1114)
- ° Rescued by firefighters. (2 occupants of Rooms 814 and 1114)
- ° The male occupant of the fire room fell into Room 514, and with the help of the occupants of that room, they escaped to Room 515 via the balcony.

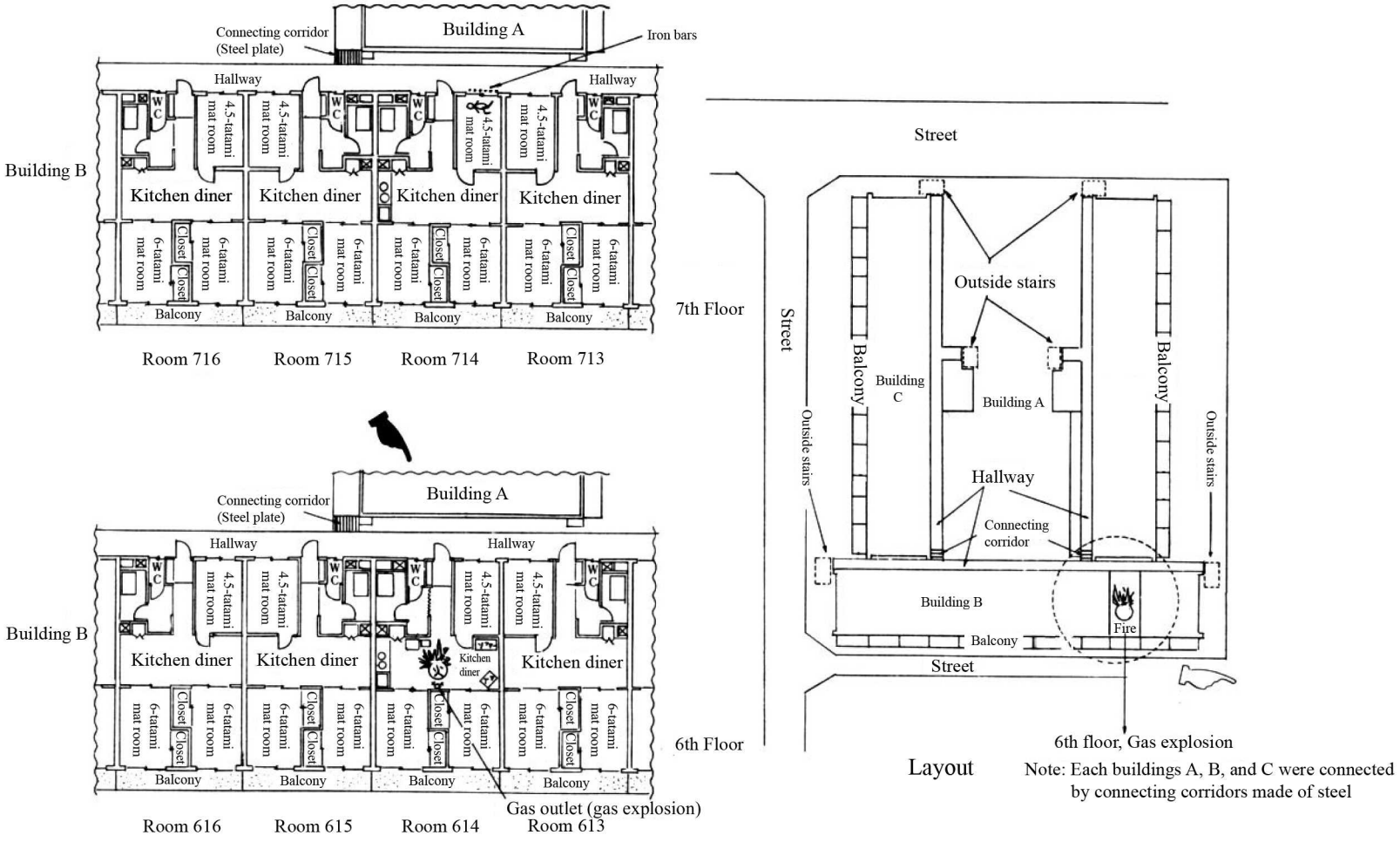
(6) Causalities

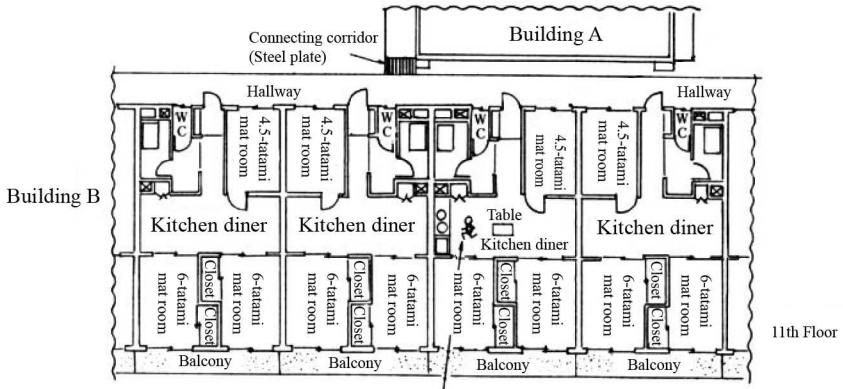
Healthy individuals 2 (Drunk persons) Individuals in need of assistance Infants Elderly Handicapped Patients/ill persons	Obstacles to Evacuation ° No windows [ ] ° Barred openings [X] ° Locked emergency doors (Exits) [ ] ° Alarm system [ ] (Poorly controlled, Malfunctioned, Not installed) ° Power outage [ ] ° Other [ ]

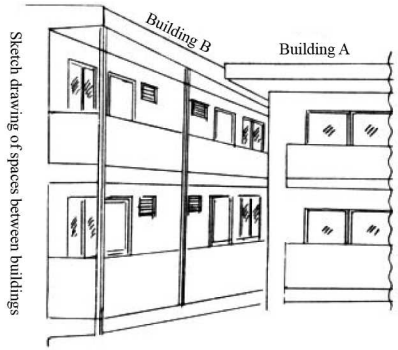
- ° A female occupant (age 21) who was asleep in the 4.5-tatami room of Room 714 was trapped by the growing flames and died because her kitchen floor collapsed and her window was protected by iron bars.
- ° In Room 1114, a family of 4 were sleeping. Their entrance door was deformed and the man and his oldest daughter barely escaped via the window, but his wife (age 31) and youngest daughter (age 3) were trapped. They were rescued by firefighters, but the wife died of carbon monoxide poisoning.

IV. Issues and Lessons Learned

1. The explosion caused the 6th and 7th floors to collapse and the fire to spread quickly to Rooms 514, 614, and 714.
2. Many occupants were trapped by the deformed doors and the barred windows facing the hallway. This made the evacuation difficult and resulted in many casualties.
3. When designing a high-rise apartment building, the designer should plan for effective street width or open space on the side of the building so that an emergency vehicle (ladder truck) can access the building effectively.
4. In this fire, the ladder truck operation was hampered by parked cars and utility poles on the street.


Building A
Connecting corridor
(Steel plate)
Iron bars
Hallway
Hallway
Building B
Kitchen diner
Kitchen diner
Kitchen diner
Kitchen diner
4.5-tatami mat room
6-tatami mat room
Closet
WC
Balcony
7th Floor
Room 716
Room 715
Room 714
Room 713
Building A
Connecting corridor
(Steel plate)
Hallway
Hallway
Building B
Kitchen diner
Kitchen diner
Kitchen diner
Kitchen diner
6th Floor
Gas outlet (gas explosion)
Room 616
Room 615
Room 614
Room 613
Street
Street
Outside stairs
Balcony
Building C
Building A
Balcony
Outside stairs
Hallway
Connecting corridor
Building B
Balcony
Fire
Street
6th floor, Gas explosion
Layout
Note: Each buildings A, B, and C were connected by connecting corridors made of steel

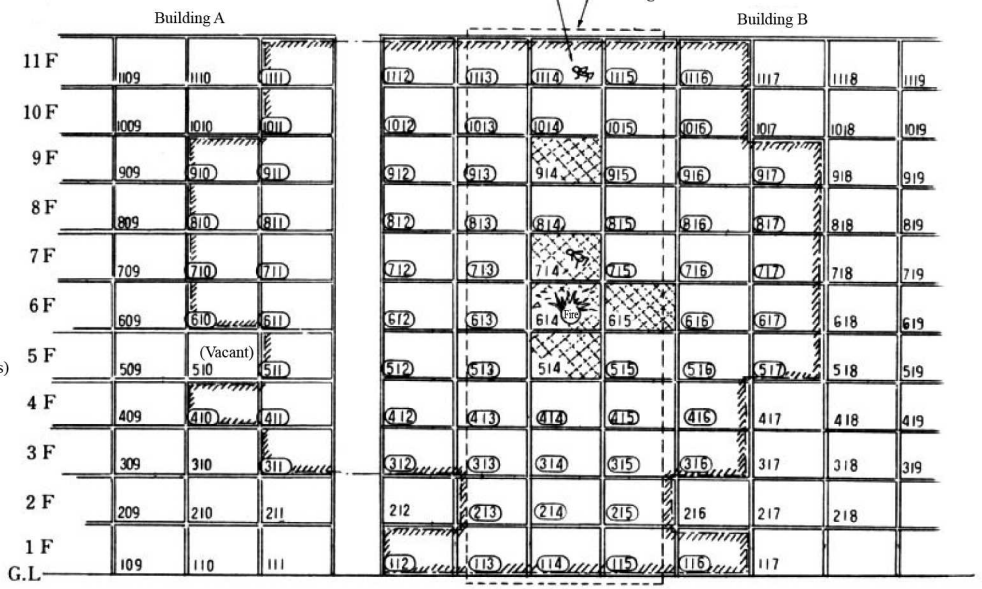




Rescued by firefighters; died in hospital

Rescued by firefighters; died in hospital

Building A is behind this



Legend

- Completely damaged (5 rooms)
- 123 Half damaged (67 rooms)
- Minor damage
- Location of Building A