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
Yurakucho Building	Complex (16) a	March 13, 1968 Breakout at12:41 (approx.) Notified at 12:46 Notified by emergency call Extinguished by 13:33	Fire resistive 12 stories above ground and 5 below Building area 2,942 m2 Total floor area 41,936 m2	All, Half, Partial, **Small** 34 m2 (%)	Fatalities 3 Injured 5 (2)
1-5 Yurakucho, Chiyoda-ku, TOKYO					

I. Summary of Fire Incident

(1) Summary

The fire originated from a sauna house, a facility which became very popular in Japan following the Tokyo Olympics. Although the fire itself was relatively small, it resulted in 3 fatalities because of the unique structure of the sauna room and the heavy smoke that obscured the evacuation route.

(2) Conditions per Floor

FL	Total area	Damaged area	Use (Purpose)	No. of persons	No. of fatalities	Fire escape equipment	Firefighting equipment
PH	m2	m2				Inside stairs 5 sets of 4 sets of fire escape equipment (on each floor from 2nd to 5th floors) 5 sets of escape chutes (on each floor from 6th to 10th floors)	48 sets of indoor fire hydrants(2 sets on B5 floor , 3 sets on each floor from B4 to B2, 2 sets on B1, 3 sets on 3rd floor, 4 sets on each floor from 2nd to 9th) Sprinkler system (10th to 12th floor) Water pipe connections Automatic fire detection system Emergency electrical outlet (11th to 12th floor) Chemical foam extinguisher (B2 and B3 floors) Carbon monoxide alarm (B5 floor)
12	361.0						
11	679.0		Office	333			
10	2,317.0		Office	70			
9	2,317.0		Office				
8	2,317.0		Office				
7	2,317.0		Office	10			
6	2,317.0		Office				
5	2,317.0		Office	226			
4	2,083.0		Office, Movie theater	192			
3	2,083.0		Office, Movie theater	374			
②	2,942.0	34	Retail, Sauna house	79	3 males		
1	2,911.0		Retail				
B1	3,472.0		Restaurant, Retail				
B2	3,465.0		Car parking				
B3	3,452.0		Car parking				
B4	2,380.0		Machine room, Storage				
B5	1,807.0		Machine room, Storage				
Total	41,936.0	34		△1,284	3		

(3) Oriain of Fire	(Floor, Room, Part, Combustibles, Habitable/Non-habitable Rooms, Present/Absent) <u>The fire emerged from the sauna house on the 2nd floor (Yurakacho Sauna)</u> ° The sauna room was made of combustible materials such as spruce lumber and phenolic foam material. There was a sauna heater (200 V, 4 kW) placed under the seating bed. ° When the fire emerged, there were 3 guests in the locker area of the sauna house.	**(4) Cause of Fire**	The cause of the fire is believed to be smokeless ignition that started from the wooden seating bed that was placed too close to the sauna heater. The wooden materials became very dry because the sauna heater was turned on for a long time at a temperature of 120 °C while there were only a few people using the sauna.

(5) Fire Propagation Path

(Location of Fire Source)	(Propagation from Source)	(Propagation to Adjacent Rooms)
Wooden portion above the heater in the sauna room on the 2nd floor	Spread to the interior materials, walls and ceiling of the sauna room	Through the vent of the sauna room and the combustible walls, the fire spread to the ceilings of the washstands and the front desk of the sauna house

In the special sauna room, the fire emerged from the upper part of the heater and spread to the combustible interior materials (walls and ceiling). The spread of the fire was facilitated by the wooden rafters, plywood walls, and ventilation openings and reached the ceiling of the washstands and front desk.

- Main Reasons for Propagation of the Fire
  - The interior materials were combustible and dry, which accelerated the spread of the fire.
  - There was no fire compartment in the sauna room.
- Smoke Propagation Path
  - The sauna room was filled with noxious fumes produced by from the phenolic resin of the spruce lumber and foam material, and the fumes propagated through the vent throughout the sauna house.

II. Summary of the Building

(1) Built

Construction, Completion, and Major Renovations
(Completion) April 1966

Fire Prevention Management

(2) Vertical Shafts

Stairs	[X]	Duct Spaces	[X]
Elevator	[X]	Pipe Shafts	[X]
Escalators	[ ]	Other(vaulted ceiling)	[ ]

- Each of the vertical shafts was partitioned by the fire-resistive or fire-preventive walls.

(3) Fire Prevention

- The building had appointed a fire-prevention manager and submitted a fire defense plan to the local fire station.
- The building had an in-house firefighting team.
- Once every month, the security guards carried out a fire drill with the indoor fire hydrants and fire extinguishers.
- The building underwent inspection approximately 5 times a year and no significant violation was reported.
- The tenants were less aware of fire prevention and relied more on the building management for this matter.

(4) Fire Compartment

There was no fire-preventive partition to the wooden sauna room.

(5) Firefighting Equipment

- The firefighting equipment was well maintained, however, the sauna room did not retain any detector for the automatic fire alarm system. (In those days, installation of a detector was not required by law, but was recommended by the regulatory authorities.)

III. Actions Taken after the Fire was Detected

(1) First Detected

- **Detected by** (Sauna house staff)
- **How and why** (Unusual smell)
- **Action taken** (Alerted the guests and made a 119 call)

A part-time staff member, A, was at the front desk of the sauna house and noticed an unusual smell. Although she followed the smell to the entrance of the sauna room, she did not confirm anything unusual and returned to the desk. However, as the smell became stronger, she went to the sauna room again and opened the door. Then the heavy smoke poured out of the room. She alerted guests in the locker room and made a 119 call from the phone at the front desk.

(2) Emergency Call

Emergency Call Yes [X] (Sauna house staff) Time elapsed since the discovery ( ) minutes

No [ ]

The part-time staff member, A, alerted the guest and made a 119 call.

(3) Initial Firefighting Activities

Initiated	Successful [ ] Failed [X] ° Extinguished time [ ] ° Firefighting difficulties [X] ° Firefighting method [ ]	**(Reasons or Conditions)** Approximately 10 persons walking by the sauna house grabbed fire extinguishers from the hallways and the lobby of the building, but they could only use them in the entrance of the sauna house (they could not enter due to heavy smoke), so they could not contain the fire effectively. Other people extended 2 hoses from the indoor fire hydrants on the 2nd floor, but this was also not effective because of the heavy smoke that prevented them from entering the building.
Not initiated	° Extinguished time [ ] ° Firefighting difficulties [ ] ° Firefighting method [ ] ° Other [ ]	

(4) Summary of Firefighting Activities

(Obstacles or Difficulties in Fire Control)

- There was only one entrance to the sauna house and therefore the heavy smoke and heat were trapped inside and prevented people from entering to make a fire assessment and perform a search and rescue operation.

(5) Evacuation

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

° Most of the tenants on the 2nd floor became aware of the fire because of the smoke, noise in the hallway, and the sound of the alarm coming from the PA system. They tried to extinguish the fire with the fire extinguishers, alerted the security office on the 2nd basement floor, or helped others to evacuate.
° Once the security office was alerted, the guards closed the fire doors on the stairs to prevent the fire from spreading, and released the smoke outside from the inspection door of the parking facility of the 2nd floor. Through this effort, the smoke did not propagate to other floors. The security office also made an announcement about the fire over the PA system, which facilitated smooth evacuation.
° One of the tenants on the 2nd floor called and alerted the movie theater on the 3rd floor, and the movie theater staff helped approximately 230 people to evacuate via the inside stairs.

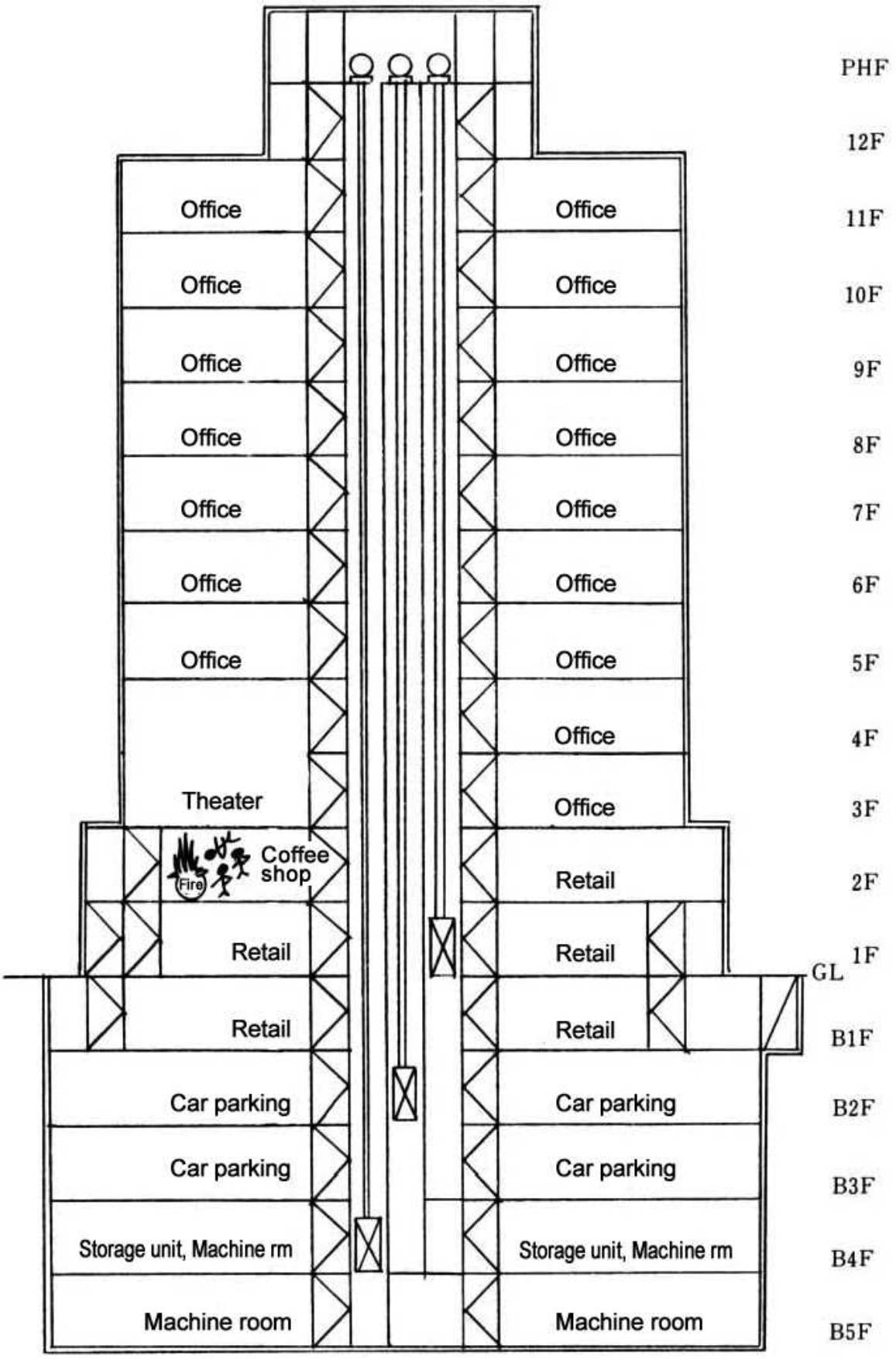
(6) Casualties

	Obstacles to Evacuation
Healthy individuals 3 (Drunk persons) Individuals in need of assistance Infants Elderly Handicapped Patients/ill persons	° No windows [ ] ° Barred openings [ ] ° Locked emergency doors (Exits) [ ] ° Alarm system [ ] (Poorly controlled, Malfunctioned, Not installed) ° Power outage [ ] ° Other [X] (Heavy smoke)

One of the sauna staff members confirmed that 3 guests wearing sauna gowns evacuated the building; however, these 3 were found unconscious in the locker room in their own clothes. Given this, the guests must have assumed that they still had time to go back into the sauna house and did indeed return. However, while they were getting dressed, they were trapped by the smoke and inhaled noxious fumes. Although they were rescued by firefighters, they died of carbon monoxide poisoning shortly after arriving at hospital.

IV. Issues and Lessons Learned

1. Saunas should be partitioned by a smoke- and fire-preventive compartment.
2. The nature of a sauna requires insulation, and as such, the sauna was made of many combustible materials such as spruce, plywood, and phenolic foam in places where no metal cannot be used, and the inside of the sauna was kept at high temperature and low humidity. In such conditions, placing a sauna heater under the seating bed was careless from the aspect of fire safety.
3. The size of the sauna house was relatively small and only 2 female employees were handling the business, which inevitably affected their attention to fire safety matters. Therefore, each tenant needs to review the purpose of fire prevention and the necessary measures according to business type.
4. Individuals who had evacuated returned to the fire room in order to salvage their belongings and died because of this action. It is necessary to remind people that such action is highly dangerous.
5. To be able to detect a fire at an early stage, all kinds of sauna rooms should have a fire detector installed.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Retail
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1F
Retail
Retail
B1F
Car parking
Car parking
B2F
Car parking
Car parking
B3F
Storage unit, Machine rm
Storage unit, Machine rm
B4F
Machine room
Machine room
B5F

Enlarged image of the sauna