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
Shiraishi Central Hospital	Hospital (6) a	Feb. 6, 1977 Breakout at 07:41 (approx.) Detected at 07:54 Notified by emergency call Extinguished by 09:35	Fireproof structure, 2 stories above ground and 1 below Partially wooden, 2 stories above ground Building area 1,238 m^2 Total floor area 1,959 m^2	All, Half, **Partial**, Small 648 m^2 (33%)	Fatalities 4 Injured 5 (2)
3-N2-3 Heiwa-dori, Shiraishi-ku, Sapporo, HOKKAIDO					

I. Summary of Fire Incident

(1) Summary

Ninety inpatients (including 6 newborn babies) were in the hospital when this hospital fire occurred. This fire resulted in 4 fatalities (1 seriously ill patient and 3 newborn babies) because of late detection, failure to extinguish the incipient-stage fire, slow communication with the fire station, the action of an irresponsible nurse, lack of duty personnel, and inadequate evacuation procedures.

(2) Conditions per Floor

Floor	Total area m^2 Old building, wooden	Total area m^2 New building, fire resistant	Damaged area m^2 Old Building	Damaged area m^2 New Building	Use (Purpose)	No. of persons Old Building	No. of persons New Building	No. of fatalities	Fire escape equipment	Firefighting equipment
PH		18							Old Building 2 sets of inside stairs (1st to 2nd floors) 1 set of outside stairs (1st to 2nd floors) New Building 2 sets of inside stairs (1st to 2nd floors) Escape chute	10 sets of dry-chemical fire extinguishers Indoor fire hydrants Automatic fire detection system, Type P Grade 1, 10 lines Guiding lights
2	274	429	648		Patients room	38 persons incl 27 patients	73 persons incl 63 patients	4		
(1)	809	429			Exam rooms, Offices Patient rooms, Dining, Kitchen					
Sub Total	1,083	876				38	73			
Total	1,959		648			111		4		

(3) Origin of Fire

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

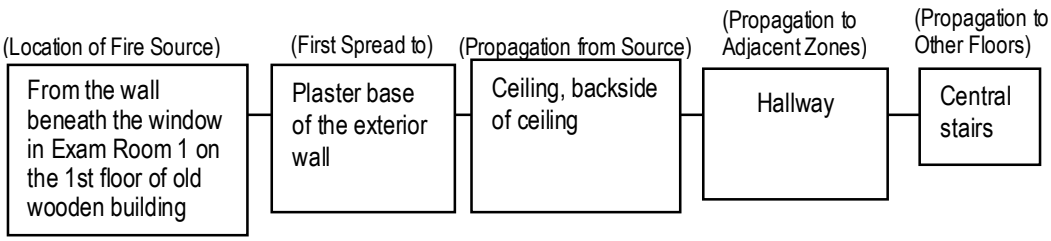
From the wall beneath the window in Exam Room 1 (Hospital Director's office) on the south side of the 1st floor of the old wooden building

There was an exposed drain pipe and a radiator for the heating system. The pipe passed orthogonally through the wall beneath the window to outside. (The pipe was 405 mm x 28 mm in diameter, and the diameter of the through hole in the wall was 80 mm.) After service personnel defrosted the frozen drain pipe with a burner, he returned to the boiler room. No one was in the room when the fire emerged.

(4) Cause of Fire

The service personnel defrosted a frozen drain pipe for the steam heating system by leaning the pipe outside the window he opened. Presumably, since he did the same work a day before, the butane burner that he used from the top side of the pipe caused the plaster base inside the wall to become carbonized and caught on fire from smoldering.

(5) Fire Propagation Path



The fire that emerged from the wall beneath the window in Exam Room 1 burned the plaster base inside the wall and spread to the ceiling, backside of the ceiling, hallway in front of the fire room, and Exam Room 2. From the central stairs near the waiting room, the fire spread quickly to the upstairs because the flame ignited kerosene, which was leaked from the burning hose of a 90-liter service tank containing 70 liters of kerosene for the heating system at that time.

- Main Reasons for Propagation of the Fire
  A flashover that was triggered inside the old wooden building spread the fire instantly and a draft of air on the stairs to the 2nd floor increased the speed of propagation.
- Smoke Propagation Path
  Hallway to stairs

II. Summary of the Building

(1) Built

Construction, Completion and Major Renovations
(Old building) 1964 (New building) 1966

Fire Prevention Management

(2) Vertical Shafts

Stairwells	[X]	Duct spaces	[ ]
Elevators	[ ]	Pipe shafts	[ ]
Escalators	[ ]	Other ( )	[ ]

N/A

(3) Fire Prevention

The hospital had complied with the fire-prevention manager requirement, but after he retired, no-one was appointed as his successor, nor was a report submitted to the fire station after his retirement. The hospital had 2 sets of fire defense plans, one for regular office hours and the other for off-business hours (nighttime and weekend). The hospital carried out a fire drill internally.

(4) Fire Compartments

The 2-story old wooden building was connected with the 2-story new fire-resistive building with a connecting corridor to make two buildings into one large building.

(5) Firefighting Equipment

A fire inspection was carried out more than once a year and the inspectors pointed out the need to:

- Install a backup battery and priming-water tank for the indoor fire hydrant.
- Fix the transmitter and red lamp of the automatic fire detection system, which were not functioning. (The hospital corrected these issues.)
- Submit an inspection report. (Completed.)

III. Actions Taken after the Fire was Detected

(1) First Detected

- **Detected by** (Night guard and caretaker)
- **How and why** (Alarm sound coming from the automatic fire detection system)
- **Action taken** (Turned of the main alarm and then rushed to the fire location)

Around 07:48, Caretaker A (age 53) who was paying his phone bill for a personal call that he made from the office on the 1st floor of the old building and Hospital Night Guard B (age 63) who was near him heard the alarm sound coming from the automatic fire detection system in the office. The control panel indicated that the fire location was "Outpatient Exam Room 1" and therefore Caretaker A rushed to the fire location. After turning the main alarm off, Guard B followed. When they opened the door to Exam Room 1, smoke had filled the room and the center of the room was burning.

(2) Emergency Call

Emergency Call Yes [X] (wife of the hospital director) Time elapsed since detection ( ) minutes

No [ ]

Kitchen Staff C (age 42) who was preparing breakfast heard the alarm sound inside the kitchen. When she rushed to the fire location, Caretaker A asked her to make a 119 call. She rushed to the office to make the call from the regular land-line telephone, but she was in a panic and could not remember the number, so she alerted Staff D (age 38) who was in the office. Staff D called the hospital director's residence and the wife (age 43) of the director who received the call made a 119 call.

(3) Initial Firefighting Activities

Initiated	Successful [ ] Failed [X] ° Extinguished timing [X] ° Firefighting difficulties [ ] ° Firefighting method [ ]	**(Reasons or Conditions)** A little after Caretaker A and Guard B arrived at the burning Exam Room 1, female staff members (caretaker and kitchen helper) brought dry-chemical extinguishers. Caretaker A and Guard B used the extinguishers, directing the contents inside from the door, but their efforts were not successful because the heavy smoke blocked the burning target. They gave up fire control when the fire and smoke became too strong.
Not initiated	° Extinguished timing [ ] ° Firefighting difficulties [ ] ° Firefighting method [ ] ° Other [ ]	

(4) Summary of Firefighting Activities

(Obstacles or Difficulties in Fire Control)

By the time firefighters arrived, heavy smoke was pouring out of the clearances around the openings. They could not assess the condition inside because of poor visibility. At that time, they also confirmed intense flames emerging from the south-side windows. As soon as they received information that there were 3 newborn babies in the nursery room on the 2nd floor, each team put on the masks as directed and entered the building from 2 different routes: the main entrance and the north-side escape stairs by knocking down the emergency door. However, they could not enter further because of the intense heat and heavy smoke.

Subsequently, another team broke a window on the front side of the 2nd floor and tried to go further inside with a back-up water discharging team, but they had to fall back because of the intense flames. After that, each team encircled the building to prevent the fire from spreading.

(5) Evacuation

Means of Escape (No. of Persons)	Obstacles to Evacuation
° Stairs [X] (20) ° Elevators/Escalators [ ] ( ) ° Escape equipment [ ] ( ) ° Directly to ground from windows or openings [X] (1) ° Rescued [ ] ( ) ° Other ( ) [ ] ( )	° No windows [ ] ° Barred openings [ ] ° Locked emergency doors (Exits) [ ] ° Alarm system [ ] (Poorly controlled, Malfunctioned, Not installed) ° Power outage [ ] ° Other [ ]

When the fire alarm alerted staff to the fire, a nurse (age 18) who was on the 2nd floor of the old building told the patients, "It's okay" as if nothing was wrong, and no one even tried to evacuate the building. After a while, one of the nurses noticed smoke coming from the stairs when she was patrolling the building, and then people started to evacuate abruptly. Through the north-side stairs and the kitchen area, 16 out of 21 patients (excluding the babies) in the old building evacuated to the new building. One midwife (age 50) who was in the bathroom on the 2nd floor rushed to the nursery room. She held 3 babies in her arms and escaped with nurse(s) and 4 patients to the outside stairs through the window next to the emergency exit. One caregiver escaped by breaking the wire-meshed window of the emergency exit. The patients in the new building were all evacuated via the emergency exit or elsewhere.

(6) Causalities

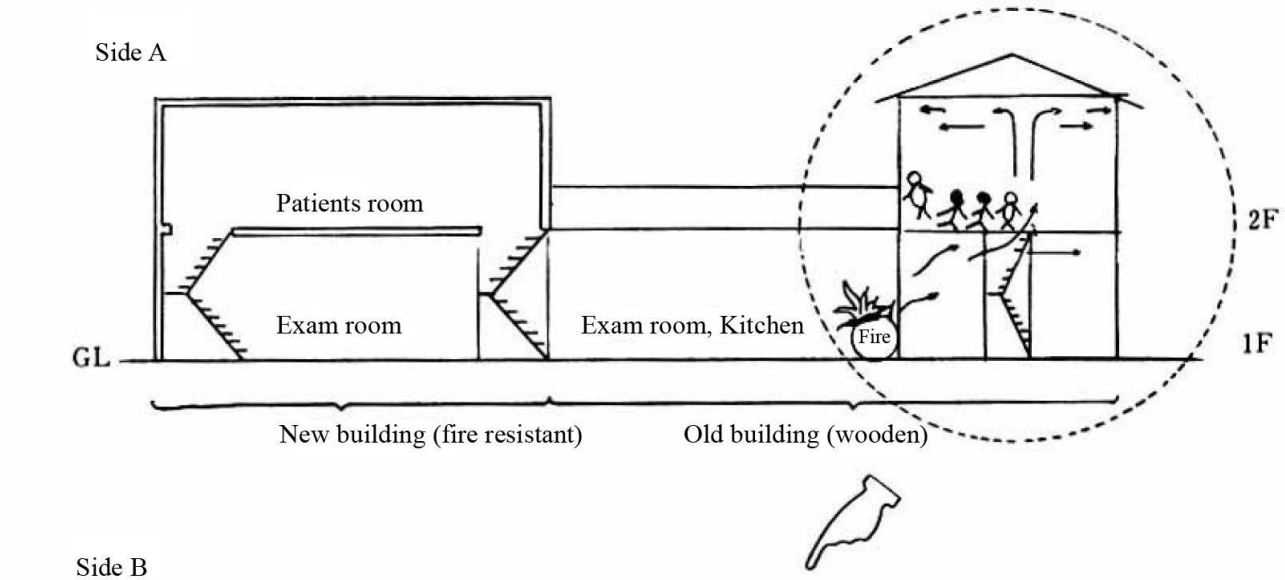
Healthy individuals (Drunk persons) Individuals in need of assistance 4 Infants 3 Elderly Handicapped Patients/ill persons	Obstacles to Evacuation ° No windows [ ] ° Barred openings [ ] ° Locked emergency doors (Exits) [ ] ° Alarm system [ ] (Poorly controlled, Malfunctioned, Not installed) ° Power outage [ ] ° Other [ ]

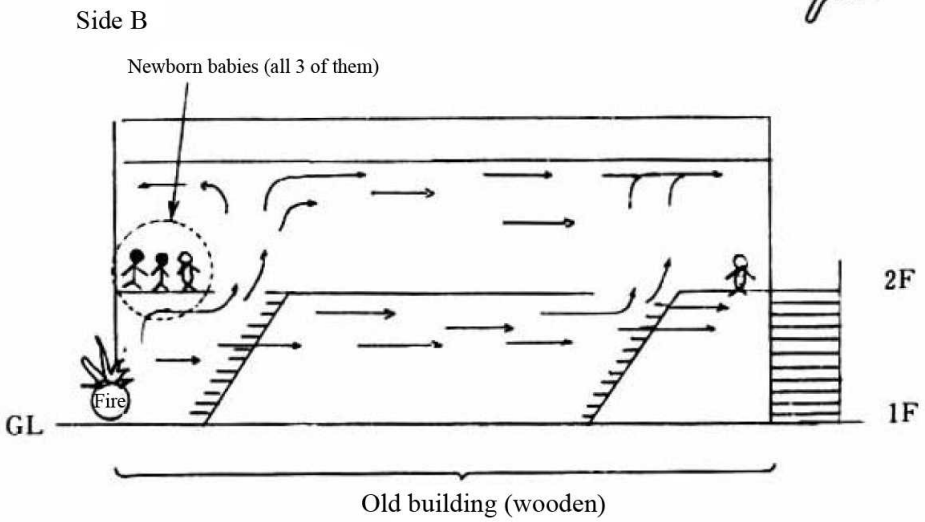
One seriously ill inpatient (age 53) was found face-down beneath the bathroom window on the 2nd floor and died of carbon monoxide poisoning.

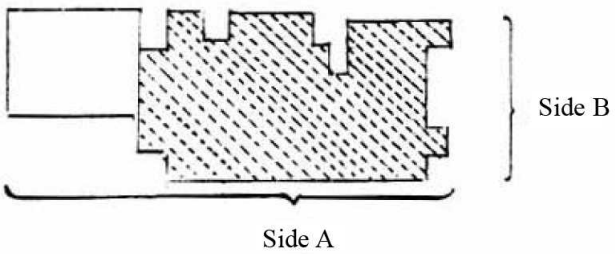
3 newborn babies died in their beds in the nursery on the 2nd floor.

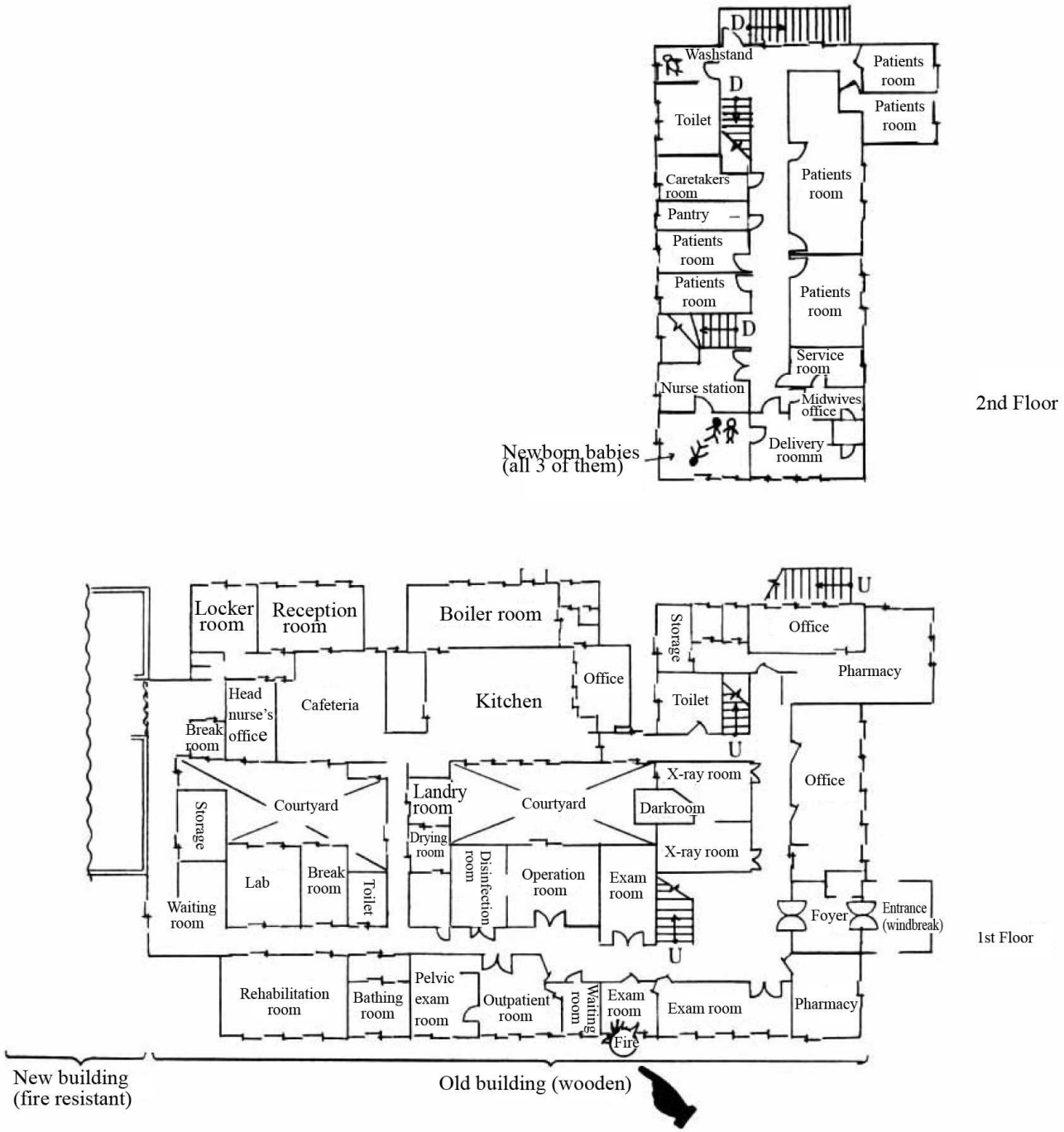
IV. Issues and Lessons Learned

1. The fire that emerged from the plaster base inside the wall was not detected until the fire started to burn the surface of the wall. The rate-of-rise heat detector in that room did not detect the rise in temperature since the origin of the fire was furthest away from the detector.
2. The 119 call was delayed, so the fire had fully developed by the time firefighters arrived. Because of this, search and rescue activities were impossible when they had received information regarding the people in need of rescue.
3. Despite hearing the fire alarm, a nurse carelessly told people that evacuation was unnecessary. This irresponsible action was brought about by a lack of internal communications and lack of preparedness for evacuation procedures in case of an emergency.
4. The emergency exit to the outside stairs was always locked by a padlock from inside and the key was stored in the nurse station. When the fire occurred, no-one unlocked this exit.
5. The in-house firefighting team was insufficient for nighttime duty and the members lacked knowledge and training. Because of this, they did not respond well as per their responsibilities.
6. To solve the fire prevention issues, the hospital was constructing a new building with fireproof features on the premises at that time.


Side A
Patients room
Exam room
Exam room, Kitchen
Fire
2F
1F
GL
New building (fire resistant)
Old building (wooden)


Side B
Newborn babies (all 3 of them)
Fire
2F
1F
GL
Old building (wooden)


Side B
Side A


D
Washstand
Patients room
Patients room
Toilet
D
Caretakers room
Pantry
Patients room
Patients room
Patients room
Patients room
D
Service room
Nurse station
Midwives office
Delivery roomm
Newborn babies (all 3 of them)
2nd Floor
U
Locker room
Reception room
Boiler room
Storage
Office
Pharmacy
Head nurse's office
Cafeteria
Kitchen
Office
Toilet
Break room
U
X-ray room
Office
Courtyard
Landry room
Courtyard
Darkroom
Storage
Drying room
Disinfection room
Operation room
Exam room
X-ray room
Lab
Break room
Toilet
Waiting room
Foyer
Entrance (windbreak)
U
Rehabilitation room
Bathing room
Pelvic exam room
Outpatient room
Waiting room
Exam room
Exam room
Pharmacy
Fire
1st Floor
New building (fire resistant)
Old building (wooden)