



TWO SERENDRA FINDINGS

DILG



Photo Source: Robin Leonard

On 31 May 2013, at approximately 7:59 p.m., an explosion took place in Unit 501-B, Section B, Tower A, Two Serendra, McKinley Parkway Drive, Bonifacio Global City (BGC), Taguig City.

INVESTIGATION OF IATF-COMPOSITE TEAM

A. IATF



B. NBI – Electrical Division



C. DOST



D. DOH



E. DPWH





Mr. James William Munday

Kroll Advisory
Solutions



Experiences

- Fire, Gas, & Vapor explosion scene examinations
- Scene examinations of est. 1,600 incidents

Credentials

- Metropolitan Police Forensic Science Laboratory (Scotland Yard)
- Institution of Fire Engineers
- International Association of Arson Investigators
- Forensic Science Society
- Diploma: Forensic Science Society in Fire Investigation
- Certified: Fire investigator

**What caused
the explosion?**

LPG

A. Unauthorized* Movement of Gas Range Caused a Detachment of the Gas Supply Hose

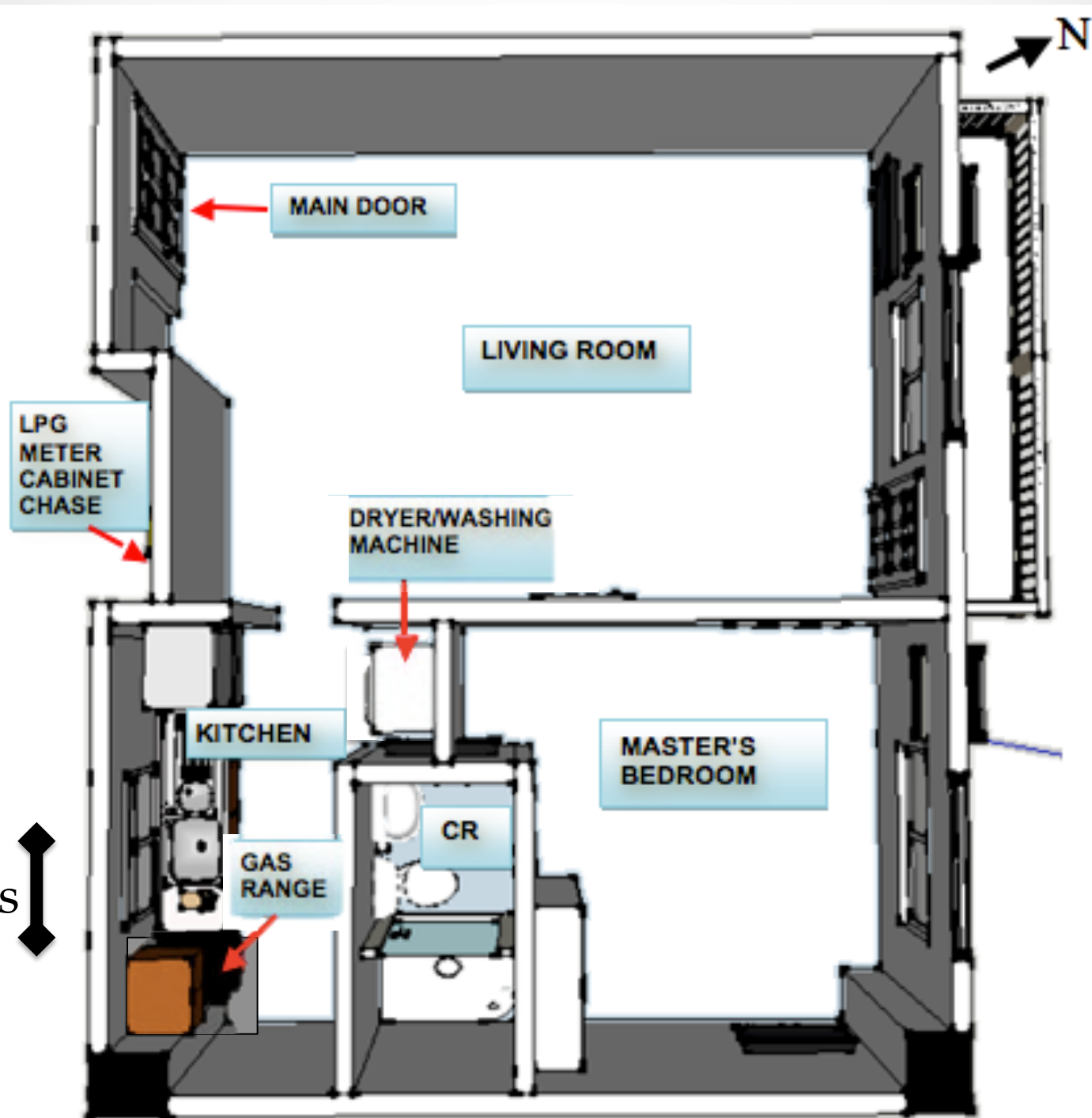
Loose Clamp



Paint drip showing hose
was lying on the floor.



*not in scope of works approved
by Serendra



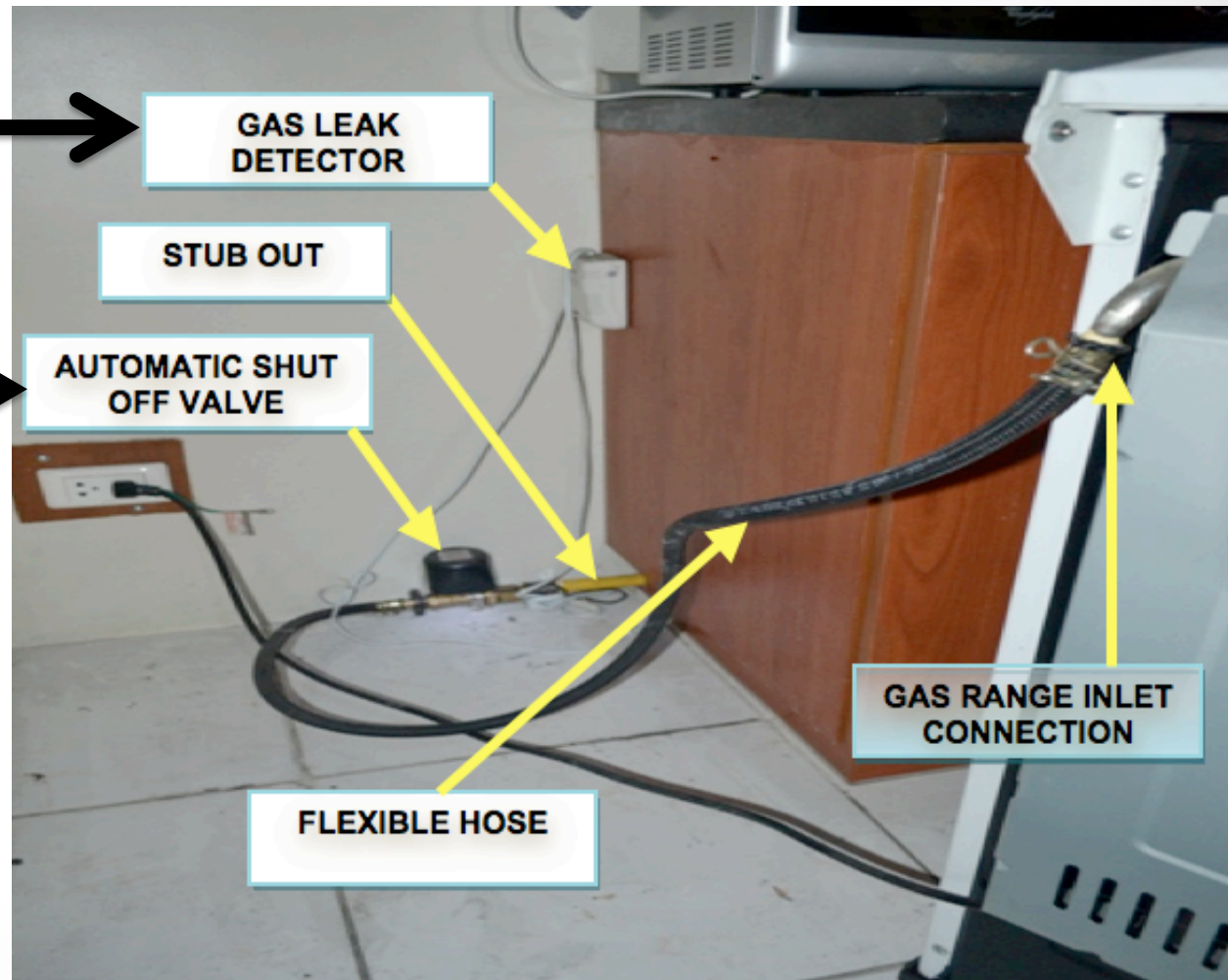
B1. Non-functional safety devices

Gas Leak Detector:

Unplugged OR the branch circuit for convenience outlets was turned off.

Automatic Shut-off Valve:

Electrically connected to the detector
A “normal-on” or “fail-open” design.



B2. Only one gas leak detector for the whole building. Lone building gas detector in Tower B did not activate.

SUPPLY CHAIN



DELIVERIES



CUSTOMERS



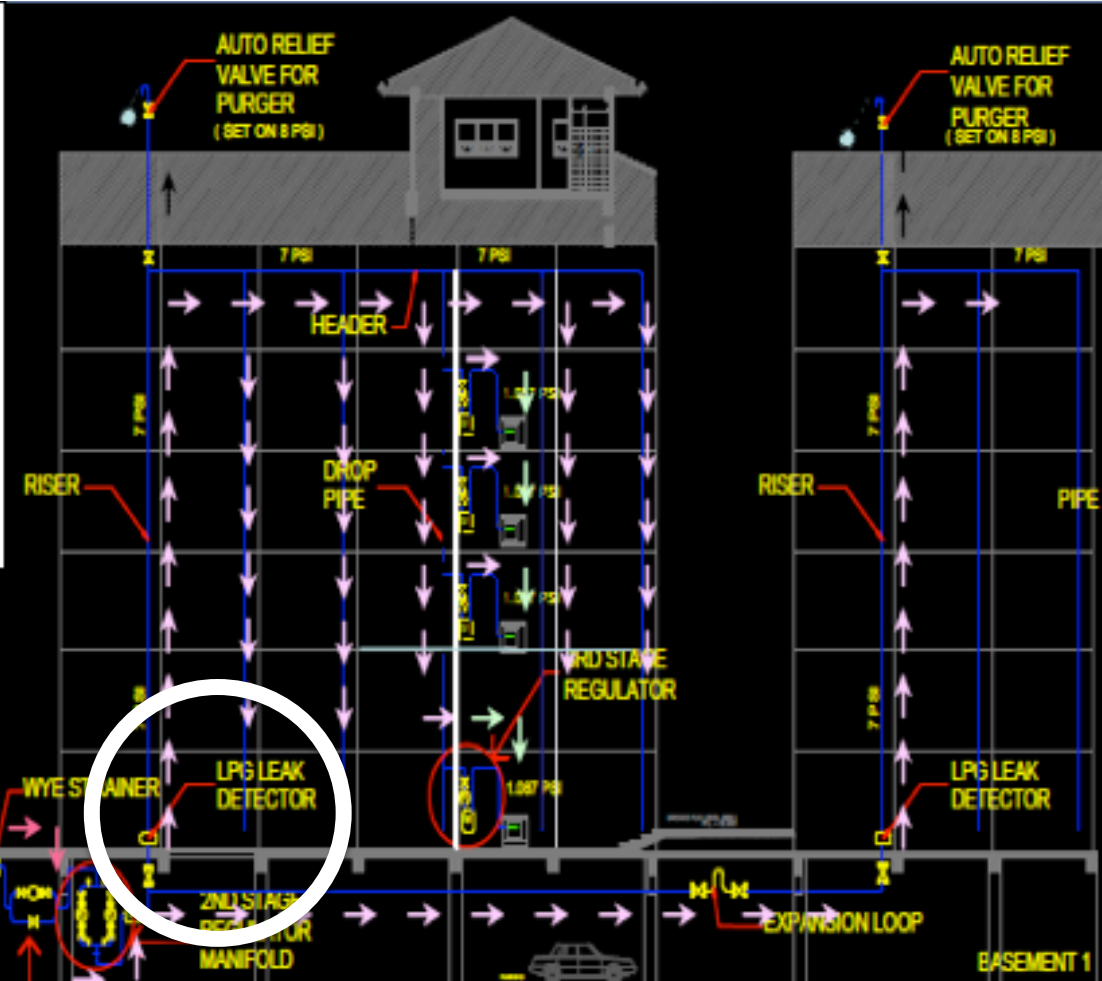
LPG TANK



VAPORIZERS

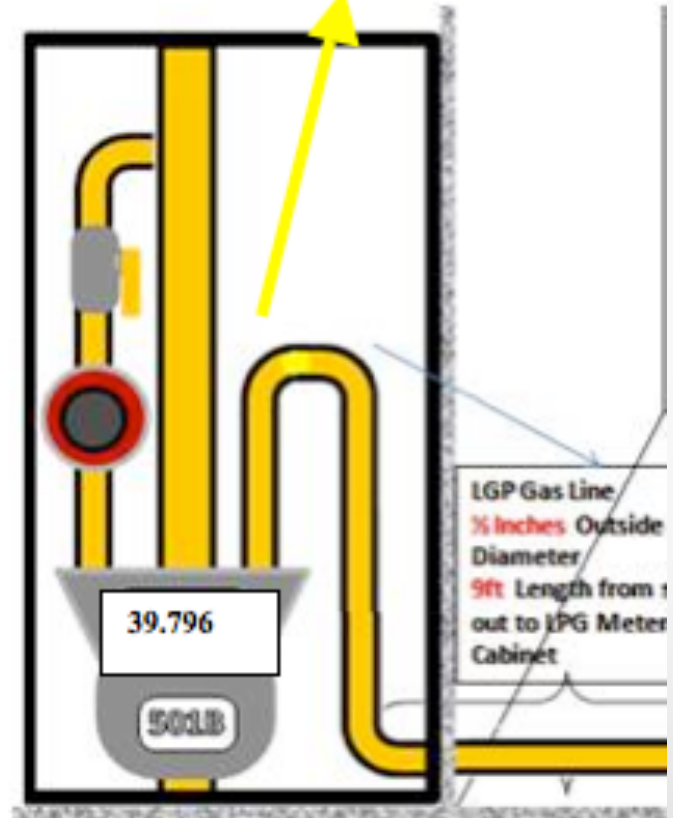


REGULATORS



C. Unauthorized Access to Gas Valve

On May 31, at around 6:30 a.m., the gas valve was opened without the assistance of an authorized person.



D. Lack of technical competence of gas supplier in handling odorant

PID reading for ethyl mercaptan	0.000000011 ppm
Odor threshold	0.0000087 ppm
LOA (Level of Distinct Odor Awareness)	0.00014 ppm

(DOH Final Technical Report dated 02 August 2013)

Vaporization of ethyl mercaptan in LPG was lost at the vaporization stage and made it below detectable levels (Kroll and BFP).



E. Negligence: “Bahala na, Okay lang” attitude

- Not obtaining all permits for renovation
- Allowing occupancy after renovation without inspection by Two Serendra
- Unauthorized access to gas valve
- Inadequate / non-functional safety devices

Possible Responsibility/ Liability of Parties

1. Owners & caretakers

- Owner of Unit 501-B
- Unauthorized Person who opened gas valve

A. Unauthorized Movement of Gas Range Caused a Detachment of the Gas Supply Hose.

B1. Non-functional safety devices

C. Unauthorized Access to Gas Valve

E. Negligence:

“Bahala na, Okay lang” attitude / Not obtaining all Permits

Possible Responsibility/ Liability of Parties

2. RM Ladrido

Construction Services:

Proprietor, Supervisor,
Foreman, Plumber,
Painter

A. Unauthorized
Movement of Gas Range
Caused a Detachment of
the Gas Supply Hose.

E. Negligence:
“Bahala na, Okay lang”
attitude / Not obtaining
all permits

Possible Responsibility/ Liability of Parties

3. Two Serendra, Inc.

B1. & B2.

Inadequate / Non-functional safety devices

C. (Allowing) Unauthorized Access to Gas Valve

E. Negligence:

“Bahala na, Okay lang” attitude

Possible Responsibility/ Liability of Parties

4. Bonifacio Gas Corporation

D. Lack of technical competence of gas supplier in handling odorant

E. Negligence:
“Bahala na, Okay lang” attitude

Possible Responsibility/ Liability of Parties

5. Makati Development Corporation

B1. Non-functional safety devices

B2. Only one gas leak detector for the whole building. Lone building gas detector in Tower B did not activate.

Submission of report



The Department of Justice to make evaluations insofar as the liability of the persons implicated in the explosion are concerned



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