

PLENUM FIRE IN A MULTI- TENANTS BUILDING

PRODUCT LIABILITY CASE

The Fire started in the plenum of a meeting room causing a considerable damage in the fire floor and a significant water damage in third parties lower floors.

Fire investigators on behalf of the Insurer of the affected business concluded that the fire origin was in a lighting fixture and therefore found the fixture manufacturer responsible.

The Investigators determined that the culprit is the fixture's capacitor.

In the past there was a recall warning concerning a lot of Capacitors following ignitions of the said product..

Let's Suppose that the fire origin is within the lighting fixture.

Should the lighting fixture be considered as the "proximate cause" for the whole some \$5,000,000 losses?

Were there other defaults or negligent acts that breaks the causative chain?

Let's considers some other intervening causes that without them the loss would have been minor, i.e. limited only to the lighting fixture

The Effects of Delays Defaults in Fire Detection and Fire Fighting operations increased the fire and water damages 10 folds.

These delays were due to:

- 1. The lack of smoke detectors in the plenum.**
- 2. The lack automatic sprinklers in the Plenum**
- 3. The 13 minutes delay of Fire Department summoning.**

Other Intervening Causes:

- 1. The installation of the Lighting Fixture by the electrical contractor without a cover that left the electrical devices within, exposed.**
- 2. The mess of electrical cables within the plenum with cables resting right on the Fixture.**

We shall address the defaults and other intervening causes in the following slides

The Lack of Smoke Detectors:

According to the Local Detection Standard smoke detectors should be installed when the plenum depth exceeds 60cm.

For areas outside (office spaces) the main corridors there is an exemption if between the those spaces and the corridors there are fire partitions

The Lack of Smoke Detectors Cont,d.,:

In this case the limit of 60cm was exceeded,

Regarding the fire partition, the standard does not contain any applicable definition.

In the actual case, the fire migrated through the partitions and initiated smoke detectors in the adjacent corridor plenum.

The Lack of Smoke Detectors Cont,d.,:

The plenum space where the fire started contained a host of electrical cabling constituting a significant fire load in relation to the space volume.

The cables penetrated the so-called “fire partitions” in an “unorganized manner”. Thus they could not be defined as “Fire Partitions”

The Lack of Smoke Detectors Cont,d.,:

Passing through the room was a vertical shaft containing electrical cables and plastic drainage piping.

The shaft was constructed with gypsum boards that failed allowing fire fighting water flooding the floors below through a floor barrier that was not water sealed.

The Lack of Smoke Detectors Cont,d.,:

It may be noted that in the Fire Detection Standard there is no definition of “fire partition” exempting installation of Fire Detectors in rooms outside the corridor.

The system was approved by the respective Lab inspectors although they had no idea what is the meaning “fire partitions”.

The Lack of Smoke Detectors Cont,d.,:

In view of the fire load within the plenum space, the lack of smoke detectors in this specific space is due to misunderstanding of the hazards on the part of the owners/renters/safety advisers /smoke detection contactors.

The Lack of Sprinklers in the Plenum

There were three (3) sprinklers below the suspended ceiling (one was neutralized by masking tape), but there were no sprinklers in the plenum. Eventually, the sprinklers operated discharging about 400 liters per minute for no effect other than flooding the lower floors via the shaft.

The Lack of Sprinklers in the Plenum Cont,d.,:

If sprinklers were installed in the plenum, one sprinkler would extinguish the fire minimizing the smoke generation and would reduce significantly the delay of arrival of the firemen.

The lack of sprinklers is another fault on the part of owners/ renters/ safety advisers.

Delay of arrival of the Firemen

When the first alarm was initiated the guard advised the Fire Department not to arrive until he investigate the cause.

But, it appears that he did not have a key to enter the premises where the annunciation came from. It took 13 minutes to find the key, but then he could not enter due to the heavy smoke.

Delay of arrival of the Firemen

Thus, on top of the delays caused by the lack of fire detection in the plenum, the lack of “Emergency Preparedness and Response” on the part of the building management cause “tenfold” increase of the fire, smoke and water damage.

The Suspending Ceiling



**Mess of
Cables on
the
suspending
ceiling and
lighting
fixtures**



**Failed Fire
Partitions,
flimsy cable
penetrations**



Cables on top of the suspended ceiling and failed fire partition between the room and the lobby



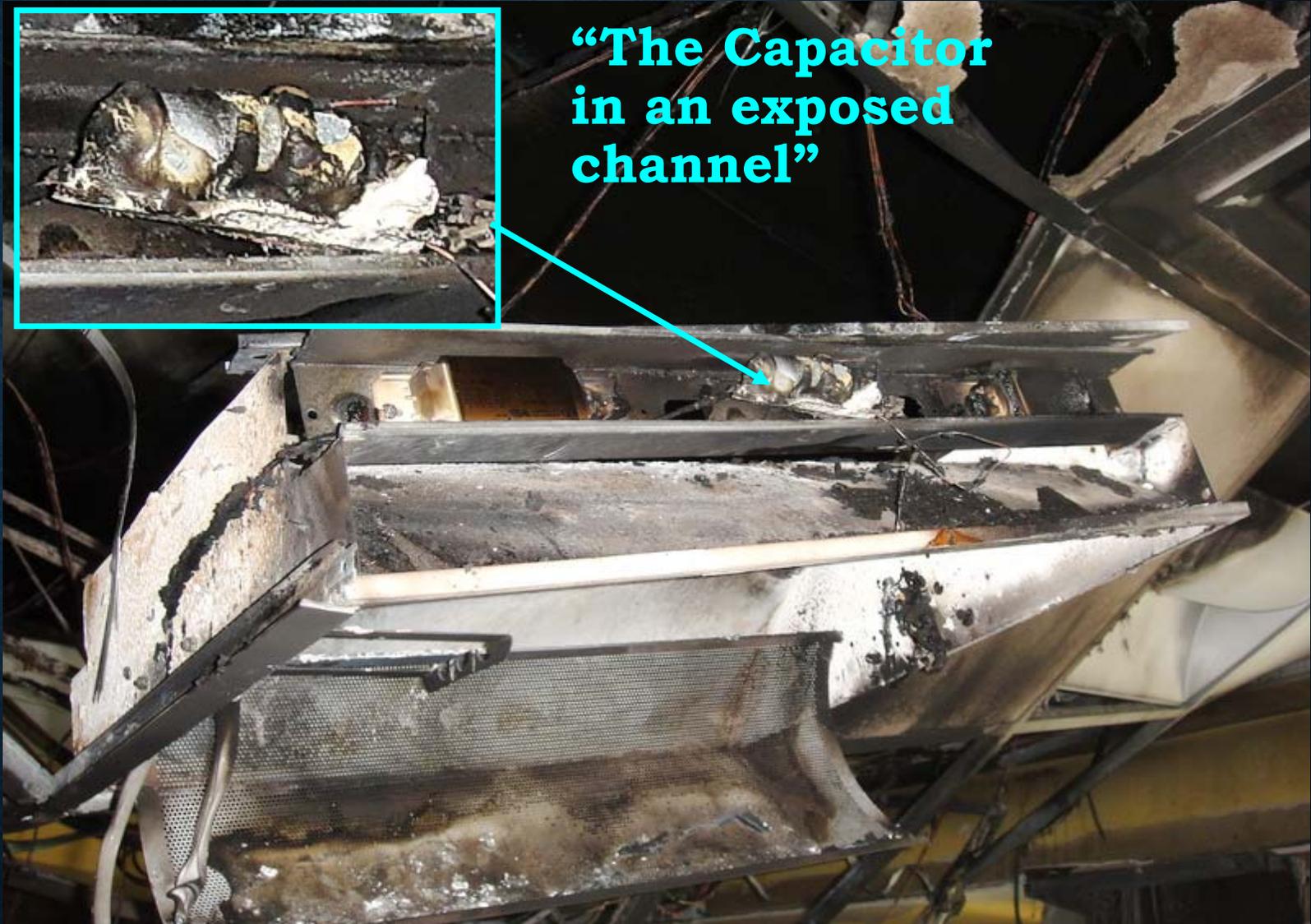
**Shaft
containing
Burnt
Cable and
newly
installed
plastic
drainage
pipes
replacing
the burnt
ones.**



**Organized
Cables on
Trays in
the
Corridor
/ Lobby
side**

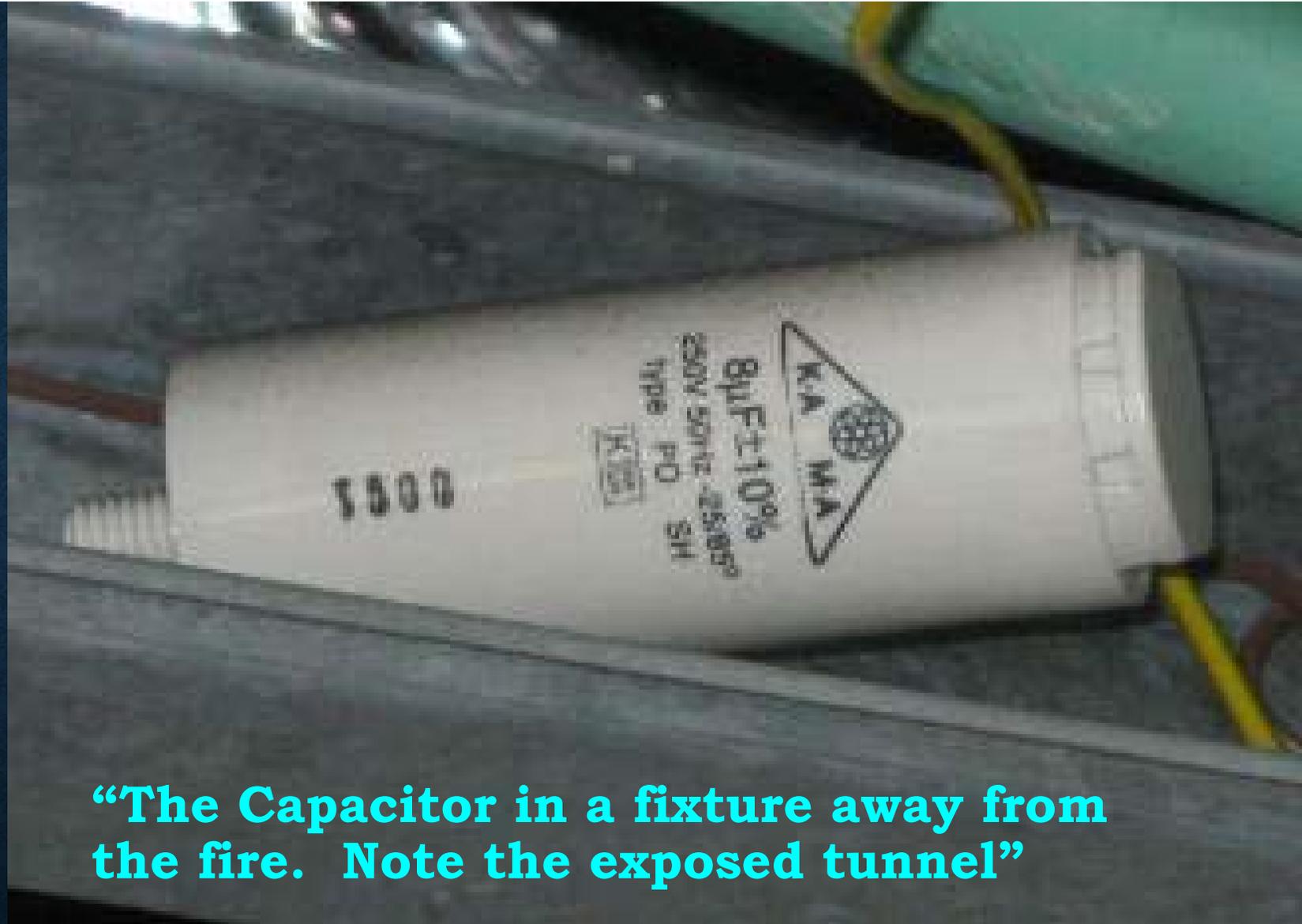


**A lighting
Fixture
next to the
one
designated
as the
“fire
origin”**



**“The Capacitor
in an exposed
channel”**

**Exposed,
uncovered
equipment
tunnel**



**“The Capacitor in a fixture away from
the fire. Note the exposed tunnel”**

**A fixture
from the
site with
the
equipment
tunnel
with a
closed
cover as
supplied
by the
Mfg.**



A fixture from the site with equipment tunnel exposed with a cover removed.



We Burn the capacitor to research the effect.



**No cover.
The cable
catch fire
if is
directly
exposed
to the
capacitor
flames.**

The Capacitor is burning



The Capacitor is burning inside

With a cover.
The cable cannot catch fire.
Not enough air within the tunnel



Other Intervening Causes:

- 1. When the Fixture is installed with a cover in place there is no fire propagation.**
- 2. Laying cables on the lighting fixtures is violation of the electrical code, not to expose cables to heating source.**

SUMMARY:

Violation of good electrical practice including improper mounting of the lighting fixtures and creating a mess of cable installation are the main intervening causes rendering the fixture origin as a remote cause.

The delay of the detection and fire extinguishing intervention are the main causes of the extensive damage.