

## Incident Summary #II-1249160-2021 (#23870) (FINAL)

|                           |   |   |   |
|---------------------------|---|---|---|
| SUPPORTING INFORMATION    | Incident Date   | August 31, 2021   |   |
|                           | Location  | Courtenay, British Columbia   |   |
|                           | Regulated industry sector   | Electrical  |   |
|                           | Impact  | Qty injuries  | 0                                       |
|                           |   | Injury description  | N/A                                     |
|                           |   | Injury rating   | None                                    |
|                           | Damage  | Damage description  | Ceiling light junction boxes destroyed. |
|                           |   | Damage rating   | Minor                                   |
| Incident rating           | Minor   |   |   |
| Incident overview         | <p>An electrical contractor performing maintenance at an existing occupied 4 story condominium observed multiple flush mount ceiling fixtures, on the 4<sup>th</sup> floor common areas, that had pulled away from the ceiling. The contractor found the ceiling boxes that supported the fixtures had partially melted and were entirely discoloured and brittle. Some of the wire connections inside the box had melted away.</p> |   |   |
| INVESTIGATION CONCLUSIONS | Site, system and components   | <p>The plastic ceiling junction boxes were approved to support the flush mount fixtures. The flush mount fixtures have dual 13W florescent lamps and are approved to be mounted to the ceiling. These flush mount fixtures typically have insulation and a foil heat shield, factory installed, to prevent lamp heat from affecting the wiring and ceiling above them.</p>  |   |
|                           | Failure scenario(s)   | <p>All common areas on all floors have flush mount ceiling fixtures that were installed approximately 25 years ago without the protective insulation and foil; however, it was only the top 4<sup>th</sup> floor where 14 of the fixture's junction boxes had heat damage.</p> <p>When installing ceiling fixtures, it can be problematic for the installer to align the fixture screw hole to the junction box hole. It is possible that the insulation was removed to make installation easier.</p> <p>The 4<sup>th</sup> floor ceiling was particularly vulnerable to the fixture heat because it backs onto the attic that is already hot during summer. The fixtures on the 4<sup>th</sup> floor began pulling away, because the plastic junction box had melted, where it holds the fixture screws.</p> |   |
|                           | Facts and evidence  | <p><u>Electrical Contractor Interview:</u></p> <ul style="list-style-type: none"> <li>• Observed light fixtures on the 4<sup>th</sup> floor common areas pulling away from the ceiling.</li> <li>• Removed all common area ceiling fixtures on all floors and found 14 on the top 4<sup>th</sup> floor that were damaged.</li> <li>• Found wires and connectors within the boxes melted, boxes brittle and discolored.</li> </ul>   |   |

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|                                 | <ul style="list-style-type: none"><li>• All flush mount ceiling fixtures, on all floor's common areas, had been installed without their factory insulation and foil backing.</li><li>• The electrical contractor replaced all 88 ceiling fixtures in the common halls and stairways of all floors: and 14 defective junction boxes on the 4<sup>th</sup> floor.</li></ul> <p><u>Safety Officer Observation:</u></p> <ul style="list-style-type: none"><li>• The electrical contractor provided the Safety Officer with photos; and physical evidence including one of the defective junction boxes and one of the defective ceiling fixtures.</li><li>• The fixture did not have its backing insulation but showed remnants of glue and insulation where it had originally been installed.</li><li>• The plastic junction box was discolored and brittle, crumbling when handled.</li><li>• The photo of the junction box installed, shows the ceiling with dark discoloring, the plastic wire nuts off and the fixture support screw hole distorted (widened).</li></ul> |
| Causes and contributing factors | <p>The cause of this incident was likely due to the fixtures normal heat production radiating unrestricted to the ceiling above. During the field installation it is probable that the approved fixture was altered by removing the factory installed insulation to expediate installation.</p> <p>It is likely that only 4<sup>th</sup> floor fixture boxes were affected because they backed onto the higher temperature attic. Over time the heat deteriorated the junction box until it could no longer support the fixture.</p>  |



Image #1– Ceiling junction box that supported the light fixture. Shows wire nut melted off, distorted screw hole top left and darkened ceiling.



Image 2– Back side of fixture showing discolouration and remnants of insulation barrier that was once in place.



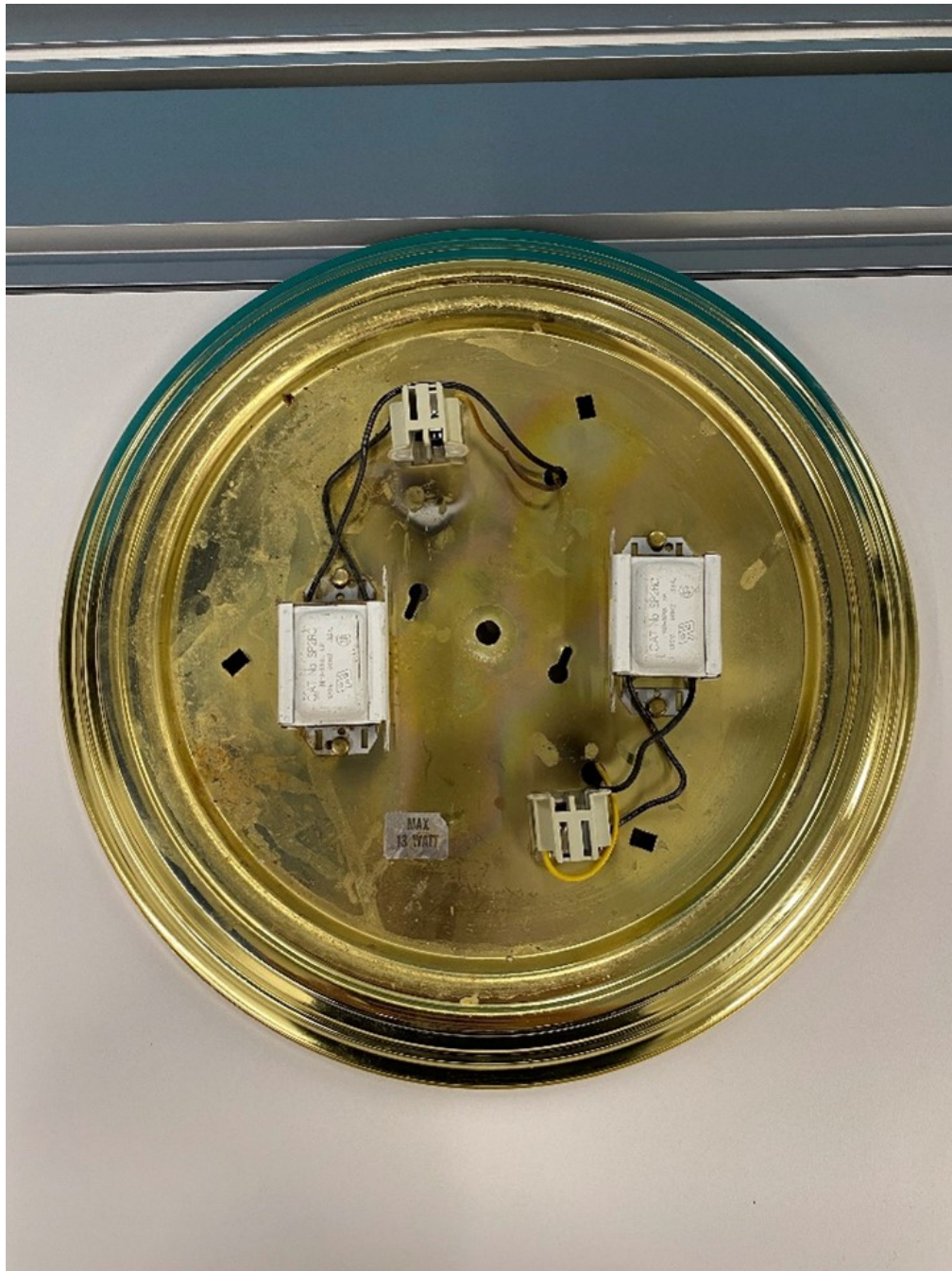


Image 3 – shows dual fluorescent lamp holders and ballasts.

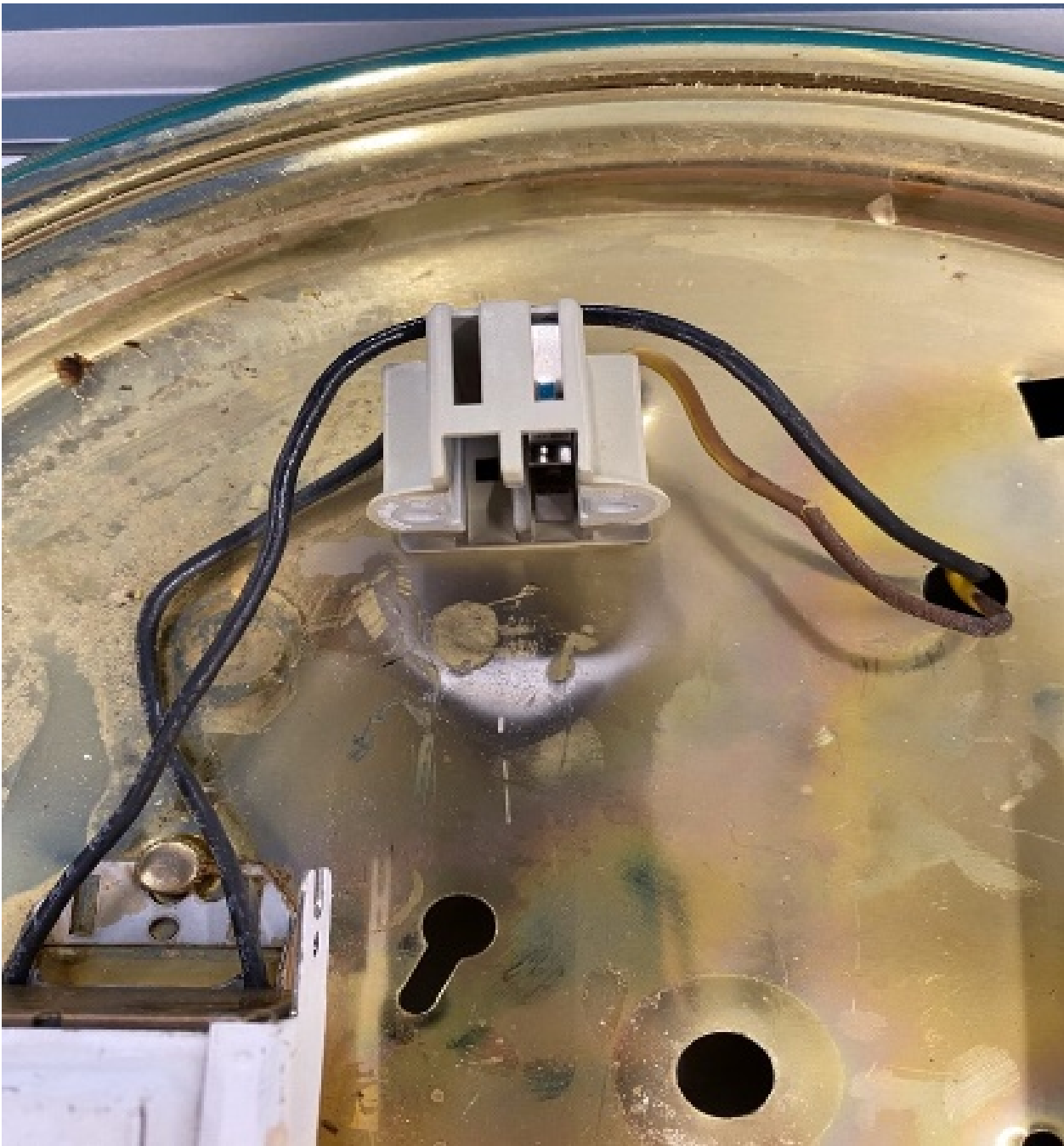


Image 4 – fixture shows discoloration from lamp heat and cracking on white conductor's insulation.



Image 5 – 13W fluorescent lamps as approved for the fixture.



Image 6 - shows fixtures approval label.