

SAFETY ADVISORY

Preventing Freewheeling of Public Safety Portable Radio Volume-Power Knob

RECOMMENDATIONS

The NIOSH Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) recommends **fire departments** ensure all firefighter portable radio volume-power knobs cannot be accidentally turned down or off while responding to or on the scene of an incident. To ensure the proper working conditions and use of portable radios, departments should make sure that firefighters:

- ❑ Recognize that the volume-power knob may be unintentionally turned down or off on some portable radios by movement from the firefighter's turnout coat and/or tools contacting and turning the power-volume knob.
- ❑ Consider upgrading to portable radios with function knobs located on top of the radios, knobs of different size with detents at each position with hard stops, and knobs that are resistant to accidental turning.



Firefighter Using Portable Radio
Photo by © moodboard/Getty Images

FFFIPP INVESTIGATION

On January 5, 2020, a fire department responded to a dryer fire at a modular home. Two firefighters in full personal protective equipment made entry into the structure with a hoseline with visibility conditions eventually turning to zero. Conditions worsened further and the firefighter on the nozzle fell through the floor. The captain, several feet behind the firefighter, was struck by debris and was unaware the firefighter fell through the floor. The communications that took place inside and outside the structure to Command were primarily face to face or shouting because of past experience with the volume-power knob freely spinning to off or low volume with the department's Motorola APX 6000 handheld radios. Several attempts were made to locate the firefighter, but heavy fire hindered rapid intervention team operations. After the fire was knocked down, the firefighter was located in the basement with a radio in his possession. He was taken to the hospital where he was pronounced deceased. As part of the NIOSH investigation, the firefighter's portable radio was inspected. Investigators could not confirm the position of the knob at the time of the incident but noted the volume-power knob could freewheel (spin freely). Freewheeling is known to have hindered fireground communication during past incidents and may have prevented a Mayday from being communicated by the firefighter.

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QUESTIONS & ANSWERS

Why does the volume-power knob inadvertently move?

There is a small O-ring under the knob that provides friction. Some O-rings may have insufficient friction, allowing the volume-power knob to move freely as a result of contact with the inner lining of the turnout coat and/or tools when the radio is in a holster or pocket.

What are the solutions for inadvertent volume-power knob movement?

1. Some newer models come with higher friction O-rings. Older model portable radios with a free moving control knob can be retrofitted to increase the resistance by replacing the O-ring in accordance with the manufacturer's guidance. See the manufacturer's installation guide for information on how to change these O-rings.
2. Consideration should be given to the purchase and use of ruggedized radios and accessories developed for the fire fighting environment per NFPA 1802.

What is the NFPA 1802: *Standard on Two-Way, Portable RF Voice Communications Devices for Use by Emergency Services Personnel in the Hazard Zone?*

This standard, released in early 2021, aims to make portable radios more environmentally rugged and enhance their overall performance. Recommended radio upgrades include ergonomic improvements to knobs and locations. The function knobs should be located on top of the radio, each knob should be a different size with detents at each position and hard stops, and knobs should be resistant to accidental turning. NFPA 1802 also calls for adherence to maintenance and service information, improved voice intelligibility, ruggedized testing for high temperature survivability that includes remote speaker microphones and cords, and establishing an intrinsic safety rating.

Note: Although NIOSH has not investigated an incident involving the channel selector knob, NIOSH has been informed by fire department personnel that this issue can occur with the channel selector knob as well.

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