Date of Hearing: May 1, 2025
Fiscal: Yes

ASSEMBLY COMMITTEE ON PRIVACY AND CONSUMER PROTECTION
Rebecca Bauer-Kahan, Chair
AB 270 (Petrie-Norris) – As Amended April 3, 2025

PROPOSED AMENDMENTS

SUBJECT: Department of Forestry and Fire Protection: autonomous firefighting pilot project

SYNOPSIS

Climate change has exacerbated natural disasters, a trend reflected in recent years by some of the most destructive and deadly fire seasons in California's history. For example, the Palisades and Eaton fires impacted hundreds of thousands of residents in Los Angeles County and caused hundreds of billions of dollars in damages. The likelihood of such catastrophic events will continue to rise as California continues to confront the growing challenges of climate change.

This author-sponsored bill would require CAL FIRE to establish a pilot project to explore the feasibility of equipping the state with firefighting helicopters outfitted with autonomous aerial fire suppression technology. This novel technology uses artificial intelligence, trained on historical fire data and California's topography, to detect fire ignitions and chart optimal flight paths to quickly suppress fires before they can spread. Currently, there is only one manufacturer producing these helicopters, and demonstrations are already underway to showcase the technology's potential.

The bill would require CAL FIRE to invite a diverse group of stakeholders to participate in the pilot program, allowing them to become familiar with the technology and receive training on its possible applications. Additionally, the bill mandates that CAL FIRE convene a panel of fire professionals to evaluate the pilot project's effectiveness and recommend a pathway for broader deployment of the technology.

The bill is supported by the Orange County Fire Authority, the California Fire Chiefs Association, and Vertical Aviation International. However, Oakland Privacy has taken an oppose unless amended position, citing concerns that the pilot program's goals are insufficiently defined.

Committee amendments outlined in Comment #6 aim to address some of these concerns by introducing metrics for evaluating the pilot's efficacy, establishing a sunset date for the project, and adding reporting requirements that align with federal regulations to ensure legislative oversight and accountability.

This bill passed the Emergency Management Committee on a 7-0 vote.

THIS BILL:

1) Requires CAL FIRE to establish a pilot project that equips California with the nation's first testbed firefighting helicopter equipped with autonomous aerial suppression technology and the associated configuration, familiarization, and training activities necessary for operation.

2) Requires CAL FIRE to invite local, state, tribal, and federal fire agencies and personnel to participate in the familiarization and training activities of the pilot project.

3) Requires CAL FIRE, no later than 60 days after the pilot project concludes, to convene leading fire professionals in California, as specified, to assess the performance of the pilot project and determine how to incorporate autonomous aerial suppression technology into existing state wildfire mitigation efforts if the pilot project meets its objectives.

EXISTING LAW:

1) Establishes CAL FIRE within the California Natural Resources Agency, and establishes various programs for the prevention and suppression of wildfires at Cal FIRE. (Pub. Reso. Code § 701.)

2) Requires the CAL FIRE Director to use eligible federal funds to supplement appropriated state funds dedicated for the puprose of replacing CAL FIRE's aging helicopter fleet. (Pub. Reso. Code § 4148.)

3) Establishes the Office of Wildfire Technology Research and Development within CAL FIRE. (Gov. Code § 8586.8.)

4) Provides the Office of Wildfire Technology Research and Development shall serve as the central organizing hub for the state government's identification of emerging wildfire technologies and is under the direct control of the Director of Forestry and Fire Protection. (Gov. Code § 8586.8.)

5) Provides the Office of Wildfire Technology Research and Development shall undertake, but is not limited to, the following activities:

    a) Develop a balanced, multimodal research and development program designed to identify, research, test, and evaluate emerging technologies and tools designed to improve the state's preparation for, and response to, wildfires in the state, including, but not limited to, fire retardants and ground, aerial, mobile, portable, communication, predictive modeling, software, or stationary equipment used for California's wildfire preparedness and by first responders.

    b) Consult with public, private, and nonprofit entities in identifying new technologies tools, software, and other advances in wildfire preparedness and response.

    c) Make recommendations to state and local agencies on the most effective and useful technologies and tools for procurement. (Gov. Code § 8586.8.)

COMMENTS:

1) **Author's statement**. According to the author:

    By incorporating the use of autonomous aerial firefighting technology into our state's existing wildfire response efforts, AB 270 will revolutionize the way we approach wildfire management and emergency response. With the power of autonomy and AI, both crewed and uncrewed missions can be carried out with unmatched precision and efficiency. By empowering pilots and fire agencies with these cutting-edge tools, we are ensuring faster,

safer, and more effective responses to wildfires and other critical emergencies—24/7. This innovation will not only modernize our response efforts but also playing a vital role in safeguarding lives, property, infrastructure, and our environment

2) **What this bill would do.** This bill would establish a pilot project within CAL FIRE to evaluate the feasibility of deploying firefighting helicopters equipped with autonomous aerial suppression technology in California. The program would invite participation from local, state, tribal, and federal fire agencies and personnel in controlled demonstrations, allowing them to familiarize themselves with the technology and its capabilities in combating fires. Upon completion of the pilot project, CAL FIRE would be required to convene a group of firefighting professionals from across the state to assess the results and determine whether the technology should be expanded into a broader statewide initiative.

3) **Wildfires.** Over the past decade, California has experienced a significant increase in the number and severity of wildfires. This trend has been driven by climate change, which continues to deteriorate environmental conditions and create longer, more intense fire seasons. Earlier this year, one of the worst fire seasons in state history struck Los Angeles County. At its peak, the fires placed an estimated 330,000 people under evacuation advisories, with nearly 192,000 residents facing mandatory evacuation orders and roughly 140,000 subject to evacuation warnings. The fires burned a combined 37,000 acres and devastated entire communities in the Pacific Palisades and Altadena neighborhoods.[1]

The Eaton Fire became the second most destructive fire in California's history, destroying 9,400 buildings, damaging 1,000 additional structures, and resulting in 17 confirmed civilian fatalities. The Palisades Fire ranked as the third most destructive, with 6,800 structures destroyed, 900 structures damaged, and 12 confirmed civilian fatalities. Combined, these fires caused an estimated $250 billion in economic damage.[2] As climate change continues to intensify the threat of catastrophic wildfires, California must equip itself with new tools and strategies to effectively combat and mitigate these disasters.

4) **Autonomous Fire Suppressing Helicopters.** Currently, there is only one autonomous helicopter available for firefighting on the market. This aircraft is a Black Hawk helicopter manufactured by Sikorsky, a Lockheed Martin company, with autonomous software developed by Rain Industries Inc. (Rain), a startup specializing in fire suppression technology and backed by DBL Partners, an investor in companies such as SpaceX, Tesla, and SolarCity.[3] Rain's AI software enables the helicopter to detect fire ignitions, chart an optimal flight path, and autonomously dispatch the helicopter toward the fire faster than is possible with human intervention. This technology has the potential to allow fire departments to contain fires in their early stages, preventing them from escalating into the major wildfires that have increasingly devastated the state.

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[1] Tim Stelloh, Marlene Lenthang, Rebecca Cohen and Phil Helsel, "California wildfires: What we know about L.A.-area fires, what caused them, who is affected and more", *NBC News* (Jan. 17, 2025), https://www.nbcnews.com/news/us-news/california-wildfires-what-we-know-palisades-eaton-los-angeles-rcna188239.

[2] Roger Vincent, "Estimated cost of fire damage balloons to more than $250 billion", *LA Times* (Jan. 24, 2025), https://www.latimes.com/business/story/2025-01-24/estimated-cost-of-fire-damage-balloons-to-more-than-250-billion#:~:text=As%20raging%20wildfires%20continue%20to,natural%20disasters%20in%20U.S.%20history.

[3] Maxwell Brodie. "Rain's Seed Financing Announcement" *Rain* (Sept. 21, 2023) https://www.rain.aero/updates/seed-funding. Information about DBL Partners can be found at https://www.dbl.vc/.

A primary concern of this Committee is whether the deployment of this technology aligns with California's data privacy laws. In conversations with a Rain representative, the company indicated that its technology is trained using satellite or flyover imagery to map California's topography, which assists in developing flight paths. Additionally, Rain is collaborating with state infrastructure experts to improve mapping of power lines and other critical areas that are not easily identifiable through satellite images. Rain also utilizes publicly available data from CAL FIRE to train its models in detecting and predicting likely fire ignition areas. If accurate, this approach suggests that Rain is developing its technologies in a manner consistent with California's data privacy requirements. However, these practices are often difficult to independently validate due to the opaque nature of proprietary data usage.

It is also worth noting that test demonstrations for various stakeholders have already begun in California. Each demonstration has been conducted under prescribed burn authorizations and supervised by various firefighting entities.[4] This raises additional questions about the necessity of funding a pilot project that, to some extent, is already underway.

5) **Integration with other CAL FIRE initiatives.** As noted in the Emergency Management Committee analysis, "CAL FIRE is collaborating with the Federal Aviation Administration (FAA), National Aeronautics and Space Administration (NASA), industry stakeholders, and various commercial and private emerging technology organizations to integrate autonomous operations." In line with these efforts, CAL FIRE, in collaboration with UC San Diego, has already begun deploying a technology known as ALERTCalifornia.

ALERTCalifornia uses a network of over 1,000 cameras and sensors strategically positioned throughout the state to continuously monitor and collect data that can be used for rapid responses to climate-related disasters. These cameras and sensors are placed in areas where fires are most likely to ignite. The tool has been made available to all 21 of California's 911 fire dispatch centers.

Within weeks of its deployment, the ALERTCalifornia system demonstrated its effectiveness:

> On September 11, 2023, the AI detected and alerted firefighters to a potential ignition on the ALERTCalifornia Wolf Mountain 1 camera at 5:19 a.m. near Grass Valley, Calif. Even though this fire was near a residential area, the first 911 call was not reported until 6:01 a.m., and firefighters were already at the scene. Early detection and rapid response allowed firefighters to keep the fire contained to less than ¼ of an acre.[5]

In its first year of use, ALERTCalifornia detected nearly 1,200 fires and outpaced 911 call responses in over 30% of cases.[6] As the technology continues to improve, so too will the state's ability to quickly identify and combat fires. Importantly, all data collected by ALERTCalifornia is open source and available for public use. This creates an opportunity to integrate

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[4] Rain Industries, "Rain and Sikorsky Demonstrate Autonomy to Rapidly Find and Suppress Test Fires", *Rain* (Nov. 12, 2024), https://www.rain.aero/updates/autonomousrapid.

[5], "ALERTCalifornia and CAL FIRE's fire detection AI program named one of TIME's Best Inventions of 2023", *CAL FIRE Press Release* (Oct. 24, 2023), https://alertcalifornia.org/alertcalifornia-and-cal-fires-fire-detection-ai-program-named-one-of-times-best-inventions-of-2023/.

[6] General Information about the ALERTCalifornia can be found at https://alertcalifornia.org/about/.

ALERTCalifornia's data with Rain's autonomous software, potentially enhancing the development of even more efficient fire detection and suppression technologies.

6) **Amendments.** While the pilot project shows promise, the bill itself lacks clarity regarding its specific objectives. For example, in an "oppose unless amended" letter, Oakland Privacy raises concerns that autonomous firefighting helicopter technologies remain untested in high-wind conditions:

> Practically speaking, AFH may not be feasible for many future California fires. A large factor in the threat of fire in the southern half of California is driven by the annual Santa Ana winds. At the time of the LA fires, the wind gusts hit 72 mph in the Malibu/Pacific Palisades area and 79 mph in the Pasadena/Altadena area. It was well-documented that firefighting aircraft couldn't be deployed because of the high winds. Fire Chief Fennessy stated at the California Assembly Utilities and Energy Committee hearing on Wildfire Spending that flying in wind gusts of 50-60 mph "gets dicey". Engineers state the more conservative figure of 30 mph as posing challenges for flying and severely impacting the effectiveness of water and retardant drops hitting their targets. Furthermore, high winds exceed the design limits of most aircraft used for firefighting.

High winds have been a major driver of wildfires throughout California, and aircraft traditionally perform poorly under such conditions. During the hearing for this bill in the Emergency Management Committee, Assembly Member Bennett raised this concern, asking whether these autonomous aircraft would significantly aid firefighting efforts in high-wind situations. In response, Fire Chief Fennessy stated:

> Significantly, I don't know. Will it make a difference? I absolutely think it will. Certainly, the military is watching very closely as well what we're doing here. Will it perform as it does in high winds or beyond what the other, you know, UH-60 Black Hawks or the Firehawks do? Still to be determined."

This exchange suggests that the ability of these autonomous aircraft to operate effectively under varying wind conditions should be included as a key evaluation criterion for the pilot project.

Moreover, the opposition letter from Oakland Privacy goes on to state:

> This pilot is better suited for DARPA and/or NASA but if must be undertaken by the Department of Forestry & Fire Protection (Cal Fire), please amend AB 270 to more clearly define the parameters of the pilot project, and the metrics for evaluation. Moreover, further discussions should address how this technology fits within current firefighting operations, resource constraints, FAA restrictions, impacts on the environment, and the potential impact on firefighter employment/displacement among others.

There is merit to the argument that the pilot project should have clearly stated objectives, particularly given the critical importance of aircraft performance in high-wind scenarios. In response, the author has agreed to amend the bill to include specific metrics to assess the pilot project's performance, including:

- Performance in high-wind conditions;
- Ability to detect people and other vehicles;
- Total time spent operating in either autonomous or manual modes;

- Number of personnel involved in the program; and
- Ability to detect other aircraft for safety purposes.

Additionally, the author has agreed to incorporate a reporting mechanism that aligns with Federal Aviation Administration (FAA) and National Transportation Safety Board (NTSB) standards. This reporting requirement will also ensure that all reports submitted to other entities are also submitted to the Legislature. Finally, the author has agreed to include an end date for the pilot project, consistent with the commitment made during the Emergency Management Committee hearing. The proposed amendments are as follows:

4149. (a) (a) The department shall establish a pilot project to ~~equip~~ **assess *whether* ~~the State of California with the nation's first testbed a~~** firefighting helicopter equipped with autonomous aerial suppression technology ~~**and the associated configuration, familiarization, and training activities**~~ ***can be*** ~~**to**~~ transitioned ~~**the aircraft**~~ into operational use ***in the State of California***.

(b) The department shall invite local, state, tribal, and federal fire agencies and personnel to participate in the familiarization and training activities of the pilot project.

(c) Not later than 60 days after the completion of the pilot project *or* ***January 1, 2029, whichever comes first***, the department shall convene leading fire professionals in California, including stakeholders from local, state, tribal, and federal fire agencies to do both of the following:

(1) Assess the performance of the pilot project. ***Metrics used to assess the performance of the pilot may include, but are not limited to:***

i. ***Ability to perform in varying wind conditions.***

ii. ***Ability for autonomous aerial suppression technology to demonstrate safety enhancing mechanisms, such as detection of people and equipment within the suppression drop zone.***

iii. ***Time spent in either autonomous or manually controlled modes.***

iv. ***Number of local, state, and federal fire agencies and personnel who have participated in the pilot program.***

v. ***Ability to operate within Fire-Traffic-Area operations management, including coordination with human piloted aircraft, during autonomous flight.***

(2) If the pilot project meets its objectives, determine how to incorporate autonomous aerial suppression technology into existing state wildfire mitigation efforts.

(d) Any reports that an operator of an autonomous aerial suppression technology that is part of the pilot project is required to submit to the Federal Aviation Administration, National Transportation Safety Board, or other local or federal agencies during the duration of the pilot project shall be provided by the operator to the department and the Legislature within 30 days of submission. In the event that the report requires an investigation of an incident, the operator of an autonomous aerial suppression technology

shall submit the report to the required regulatory agencies and the Legislature at the completion of the investigation, but no later than 6 months after the incident. The reports shall include any significant safety incidents, including accidents involving the operation of the autonomous aerial suppression technology, the circumstance of the accident, and whether the accident resulted in damage to property or in bodily injury or death.

ARGUMENTS IN SUPPORT: Rain, writes in support:

Rain Industries Inc. ("Rain") writes to express strong support for AB 270 that would create a pilot program to equip the State of California with the nation's first testbed firefighting helicopter equipped with autonomous aerial suppression technology and transition the aircraft into operational use. Capable of both crewed and uncrewed missions, autonomy and AI provide tools for pilots and fire agencies that enhance aerial firefighting and other operations such as search and rescue. This technology supports rapid, effective, and safe 24-hour responses to wildfires and emergencies in high-hazard environments, while modernizing efforts to protect lives, property, and the environment.

The increasing frequency and intensity of wildfires in California underscore the urgency of this proposal. Wildfires have caused catastrophic economic damage, reversed climate progress, and endangered lives. In 2018 alone, wildfires in California resulted in $148.5 billion in economic damage and 3,652 deaths due to smoke inhalation. In the first month of 2025, the devastation caused by the fires in LA county is already set to eclipse that estimate. With multiple wildfire risk indicators set to rise up to 30% by 2030, enhanced tools and strategies are critical to protecting our communities.

Rain is a California-based company whose mission is equipping fire agencies with the technology to stop high intensity wildfires before they grow out of control with rapid response autonomous aircraft. Rain's technology supports both crewed and uncrewed missions, equipping firefighting aircraft with the intelligence to perceive, understand, and rapidly suppress fires. Rain and Sikorsky, a Lockheed Martin company, have demonstrated since 2023 how an autonomous Black Hawk helicopter equipped with Rain's wildfire mission autonomy software and Sikorsky MATRIX autonomy system could rapidly respond to suppress or manage incipient wildfires.

We support your efforts to use innovation to bend the curve on the devastation that wildfires have wrought on communities and lives in California. This bill represents a decisive step towards a safer and more effective wildfire response capability. By adopting this technology, California will lead the nation in pioneering solutions to one of the most pressing climate resiliency challenges of our time.

ARGUMENTS IN OPPOSITION: In opposition unless amended to the bill, Oakland Privacy argues:

Both the USDA Office of Inspector General and the Government Accountability Office have investigated the effectiveness of fighting fires with aircraft and both highlighted that the U.S. Forest Services and the Department of Interior must collect data on the use of air tankers to evaluate their efficacy as well as establish a coherent fleet management plan which includes justification for the acquisition of additional aircraft. The GAO report states that "None of the agencies' studies and strategy documents contained information on aircraft performance and effectiveness in supporting firefighting operations, which limits the agencies'

understanding of the strengths and limitations of each type of firefighting aircraft and their abilities to identify the number and type of aircraft they need". And the OIG stated that "[The Forest Service] has not used aviation firefighting performance measures that directly demonstrate cost-impact…" These are just a couple of several other examinations of aircraft efficacy. Responsible governance includes tracking where the hundreds of millions of dollars are going and evaluating what is working and what isn't.

We ask that technology that deals with public safety and emergencies procured by the government is thoroughly vetted, robustly tested, deployed responsibly and involves the community in every step of the process. These technologies often make promises they don't deliver on and drain government resources and taxpayer funds. This is of exceptional importance with technology that will be used under the umbrella of public safety.

This pilot is better suited for DARPA and/or NASA but if must be undertaken by the Department of Forestry & Fire Protection (Cal Fire), please amend AB 270 to more clearly define the parameters of the pilot project, and the metrics for evaluation. Moreover, further discussions should address how this technology fits within current firefighting operations, resource constraints, FAA restrictions, impacts on the environment, and the potential impact on firefighter employment/displacement among others.

We don't support offloading all of the concrete substance required to run a pilot project to the discretion of the Department of Forestry and Fire Protection (Cal Fire) with an overly vague mandate.

REGISTERED SUPPORT / OPPOSITION:

Support

California Fire Chiefs Association
California Forestry Association
Fire Districts Association of California
Orange County Fire Authority
Rain Industries
San Bernardino County Fire Protection District
United Aerial Firefighters Association
Vertical Aviation International (VAI)
3 Individuals

Opposition

Helicopter Association International
Robinson Helicopter Company

Oppose Unless Amended

Oakland Privacy

Analysis Prepared by: John Bennett / P. & C.P. / (916) 319-2200