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STATEMENT FROM DNI HAINES AND DCIA BURNS

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[REDACTED]

## Executive Summary

DNI Haines and DDCIA Cohen established the IC Experts Panel on Anomalous Health Incidents (AHIs) to help elucidate potential causal mechanisms of the AHIs affecting US Government personnel. The panel comprised experts from inside and outside the US Government with expertise in relevant areas of science, medicine, and engineering. The panel did not examine questions related to attribution of AHIs to an actor, including the question of whether a foreign actor may be involved. The panel's findings are one of several inputs that will inform the IC's work on AHIs moving forward.

### Methodology and Scope

**Information sources.** Access to information was central to the panel's process. In response to a request from DNI Haines, departments and agencies provided the panel with dozens of briefings and more than 1000 classified documents on a range of scientific, medical, and intelligence topics. This information included the findings of compartmented programs [REDACTED] sensitive intelligence reporting, and AHI incident reports and trend analyses. Affected individuals also shared their personal experiences and medical records.

**Potential causal mechanisms.** As a starting point, the panel examined the plausibility of five potential causal mechanisms identified by the IC: acoustic signals, chemical and biological agents, ionizing radiation, natural and environmental factors, and radiofrequency and other electromagnetic energy. Throughout the study, the panel worked to identify possible mechanisms and to avoid bias for or against any of these hypotheses. The panel did not examine in detail combinations of mechanisms, although it judged some combinations, particularly those involving chemical or biological agents, to be worthy of further exploration.

**Core characteristics.** To narrow the problem, the panel assessed the potential for each mechanism to account for reported aspects of those AHIs that were particularly difficult to explain through other means. The panel's focus on these incidents should not be interpreted as diminishing the importance of other incidents. Four "core characteristics" were prominent among these AHIs: the acute onset of audio-vestibular sensory phenomena, sometimes including sound or pressure in only one ear or on one side of the head; other nearly simultaneous signs and symptoms such as vertigo, loss of balance, and ear pain; a strong sense of locality or directionality; and the absence of known environmental or medical conditions that could have caused the reported signs and symptoms.

**Plausibility.** The panel considered a mechanism to be feasible if all members agreed there was at least some credible evidence that it was technically and practically feasible in each of five areas-- a concealable source that could generate the required stimulus; propagation of the stimulus to an individual; coupling of the stimulus to the human body; ability of the coupling to cause biological effects;

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and ability of the biological effects to explain the reported clinical signs and symptoms--and other evidence did not exclude the mechanism.

## Findings

The panel reached six main findings. Some are limited by knowledge gaps or assessments that could be resolved or tested through implementing the recommendations in the next section.

***The signs and symptoms of AHIs are genuine and compelling.*** The panel bases this assessment on incident reports, medical data from affected individuals and interviews with their physicians, and interviews with affected individuals themselves. Some incidents have affected multiple persons in the same space, and clinical samples from a few affected individuals have shown early, transient elevations in biomarkers suggestive of cellular injury to the nervous system. The reported signs and symptoms of AHIs are diverse and may be caused by multiple mechanisms, but no case should be discounted. Prompt medical evaluation and care is particularly important; many individuals who have been treated immediately after an event have improved.

***A subset of AHIs cannot be easily explained by known environmental or medical conditions and could be due to external stimuli.*** Although some signs and symptoms of AHIs are common in known medical conditions, the combination of the four core characteristics is distinctly unusual and unreported elsewhere in the medical literature, and so far have not been associated with a specific neurological abnormality. Several aspects of this unique neurosensory syndrome make it unlikely to be caused by a functional neurological disorder. The location dependence and sudden onset and offset, for example, argue for a stimulus that is spatially and temporally discrete. The perception of sound and pain within only one ear suggests the stimulation of its mechanoreceptors, a specific cranial nerve, or nuclei in the brainstem, all of which mediate hearing and balance. The lack of other symptoms also helped rule-out known medical conditions.

***Pulsed electromagnetic energy, particularly in the radiofrequency range, plausibly explains the core characteristics, although information gaps exist.*** There are several plausible pathways involving various forms of pulsed electromagnetic energy, each with its own requirements, limitations, and unknowns. For all the pathways, sources exist that could generate the required stimulus, are concealable, and have moderate power requirements. Using nonstandard [REDACTED] antennas and techniques, the signals could be propagated with low loss through air for tens to hundreds of meters, and with some loss, through most building materials. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Stimulation and disruption of these biological systems has been credibly demonstrated in cells and tissues, and persons accidentally

[REDACTED]

[REDACTED]

exposed to radiofrequency signals described [REDACTED] sensations similar to the core characteristics. However, there is a dearth of systematic research on the effects of the relevant electromagnetic signals on humans.

**[REDACTED] *Ultrasound also plausibly explains the core characteristics, but only in close-access scenarios and with information gaps.*** The required energy can be generated by ultrasonic arrays that are [REDACTED] portable, and produce a tight beam. Ultrasound propagates poorly through air and building materials, restricting its applicability to scenarios in which the source is near the target, [REDACTED] It could couple to the body through the external auditory canal, interstitial spaces, or the vestibular apparatus of the inner ear. Ultrasound is used to open the blood-brain barrier in medical procedures, and acoustic stimulation of the aforementioned anatomical areas could produce symptoms consistent with AHIs. Studies of “ultrasound sickness” and related audio-vestibular symptoms have reached mixed conclusions, but the panel was presented with [REDACTED] independent, first-hand accounts in which researchers were exposed to high-power ultrasound beams and subsequently experienced some of the core characteristics.

**[REDACTED] *Psychosocial factors alone cannot account for the core characteristics, although they may cause some other incidents or contribute to long-term symptoms.*** No known psychosocial factors explain the core characteristics, and the incidents exhibiting these characteristics do not fit the majority of criteria used to discern mass sociogenic illness. However, psychosocial factors may compound some of the incidents with core characteristics. Other incidents could be due to hypervigilance and normal human reactions to stress and ambiguity, particularly among a workforce attuned to its surroundings and trained to think about security. Some of these reactions could lead to functional neurological disorders or worsen the effects of existing conditions.

**[REDACTED] *Ionizing radiation, chemical and biological agents, infrasound, audible sound, ultrasound propagated over large distances, and bulk heating from electromagnetic energy are all implausible explanations for the core characteristics in the absence of other synergistic stimuli.*** These mechanisms are unlikely, on their own, to account for the required effects or are technically or practically infeasible. Ionizing radiation, for example, produces known biological effects that are easily measured and inconsistent with the core characteristics, and chemical or biological agents alone would not cause the reported location-dependence or directionality.

## **[REDACTED] Recommendations**

**[REDACTED]** The panel offers seven main recommendations to help the US Government better understand, prevent, and manage AHIs. Implementing these recommendations will require a coordinated approach because the challenges and solutions transcend organizational boundaries. Panelists emphasize the importance of appropriate classification, privacy, and security controls on research and information that may result. Four recommendations are of especially high priority:

- **[REDACTED] Data.** Collect and coordinate incident and medical data across the US Government using a strengthened uniform database structure and enhanced standardized data, building on [REDACTED] and other efforts. Correlate comprehensive patient data with structured

[REDACTED]

incident data, and strengthen the capacity for timely investigation of events. To protect the data, [REDACTED]

- [REDACTED] **Biomarkers.** Identify and validate new biomarkers that are more specific and more sensitive for diagnosis and triage of AHIs, to reduce reliance on traumatic brain injury (TBI) biomarkers, which were validated for a specific and possibly different clinical condition. Test for the presence of these biomarkers as soon as possible after an event, ideally within hours.
- [REDACTED] **Detectors.** [REDACTED]
- [REDACTED] **Communications.** Develop a coordinated communications strategy to inform and educate the US Government workforce. Prompt and forthright communication can help lessen the effects of psychosocial factors and functional neurological disorders, regardless of cause. It can also build trust, strengthen resilience, and promulgate and protective or mitigation strategies.

[REDACTED] Three recommendations are longer-term priorities:

- [REDACTED] **Clinical measurements.** Develop better methods for taking objective clinical measurements of vestibular, inner ear, and cognitive function and make them practical for use in the field and at locations where AHIs occur. Collect patient histories and measurements within hours of an event when possible.
- [REDACTED] **Biological effects.** [REDACTED]
- [REDACTED] **Devices to aid research.** [REDACTED]

### [REDACTED] A Closing Note

[REDACTED] The panel was moved by the experiences of individuals affected by AHIs. They deserve the best possible care, as well as appreciation for their sacrifices. Panelists were also greatly impressed with the many members of the IC and broader US Government with whom they engaged. The panel feels fortunate to have supported their work.

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