

# Lockheed Martin Ethics in Engineering Case Competition

## Case Study

NOVA, Inc. [a fictitious company] is a highly successful Silicon Valley start-up that specializes in intelligent wireless communications systems to protect large public venues from armed terrorist attacks. When equipped with NOVA technology, police departments, federal agencies, and private security teams have unparalleled, real-time situational awareness that enables them to rapidly locate and disable physical threats anywhere in the vicinity of the venue being protected.

Over the past three years, NOVA has developed a heroic reputation worldwide. The NOVA-1 system has been credited with preventing violent attacks at an NFL stadium, the Olympic Games, the Eiffel Tower, and a State-of-the-Union address on Capitol Hill. NOVA's founder, Larry Diamond, has become a darling on Wall Street, and the company's stock price has risen from an IPO at \$15 per share to over \$400 per share during the same three-year period. Mr. Diamond, now a billionaire, has become a Silicon Valley icon whose vision is to eliminate armed terrorism on a global scale.

NOVA's business plan is now focused on the release of the NOVA-2, which will expand the communications range of the system to protect urban areas the size of Manhattan, where the first deployment is scheduled. If successful, the potential sales growth will be enormous, as governments worldwide procure NOVA systems to protect their urban areas. A second NOVA-2 order for \$10 billion was just received from the U.K. to protect the City of London.

A key component of the NOVA-2 is the wearable STARBURST communications transceiver (for voice and data) worn by all officers and security personnel. The STARBURST has been newly designed for the NOVA-2. It attaches securely to helmets or to uniforms at the beltline, interfaces with next-generation augmented reality glasses, and offers both a "standard" and an "extended" transmit power option to cover larger, urban environments. As currently designed, the STARBURST transmits encrypted voice and data at near-cellular frequencies (~1000 MHz).

Thirty days before the public deployment of the NOVA-2 in Manhattan, the STARBURST design team discovers that all radiofrequency (RF) safety testing of the transceiver has been performed at the "standard" power setting only and has barely passed as a wearable device. The "extended" transmit power option will be necessary for urban protection and will expose officers to 10 times the recommended level of non-ionizing radiation, shift after shift, day after day, for years. While researching the problem, the design team also discovers that there is disagreement within the scientific community regarding the health risk of non-ionizing radiation and cellular heating in humans.

The STARBURST team immediately raises the safety issue with Mr. Diamond and NOVA's Chief Technology Officer (CTO), Dr. John Sharp, and recommends a system level redesign to fall within FCC's Maximum Permissible Exposure (MPE) limits. The redesign, as proposed, will delay the production, test and delivery of the NOVA-2 for 18-24 months and severely impact both the Manhattan and London deployments. A significant delay or cancellation of the program would put the jobs of NOVA's 100 employees, as well as 500 employees in the company's supply chain, at risk.

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After hearing the report and schedule impact, Mr. Diamond and Dr. Sharp dismiss the recommendation, citing the successful RF safety test at the “standard” power level. They direct the team to continue deployment planning and to classify the safety test report as NOVA-Confidential, which prohibits a public release.

Mr. Diamond shares the report, along with his and Dr. Sharp’s conclusions, with the NOVA board of directors, which has traditionally allowed Mr. Diamond free reign to make strategic decisions affecting the company. However, a faction of the board is very concerned with the possible consequences of proceeding with the deployment, and the board becomes deadlocked over how to respond to the report.

In thirty days, Larry Diamond and John Sharp are scheduled to be joined by the Mayor of New York City, the Governor of New York, and the President of the United States in Lower Manhattan to announce “A New Era of Global Security” as 35,000 NYPD officers don the STARBURST transceiver for 24/7 usage.

With Mr. Diamond and half the board wanting to charge full-steam ahead, and the other half of the board urging caution, NOVA contacts you, a trusted outside consultant, to provide a fresh, level-headed perspective on the conflict. You are tasked with presenting to Mr. Diamond and the full board next week with an analysis of the ethical, engineering, and business issues at play. They are also seeking recommendations from you about how NOVA should proceed with respect to the NOVA-2 system in order to provide the best outcome for the company and its stakeholders.

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## Notes on Case Study

This Case Study, which has been sent electronically to all teams at the same time, will be used for all rounds of the competition.

Because the situation described above is purely fictional and deliberately challenging, there is no one correct solution. Teams can leverage whatever resources they wish (professors, colleagues, internet, scientific journals, etc.) to prepare their recommendations, with one exception. Teams are not permitted to contact current Lockheed Martin employees for guidance on this case.

Teams can assume that NOVA, Inc.’s [core values](#) and [code of conduct](#) are very similar to those of Lockheed Martin.

Any questions about the case can be directed to Lauren Schultz, who will determine with the case competition planning committee whether and how to respond to the question. *If* a response is provided, it will be posted to the [FAQs tab of the event website](#), and all participants will be notified via email that new information about the case is available.