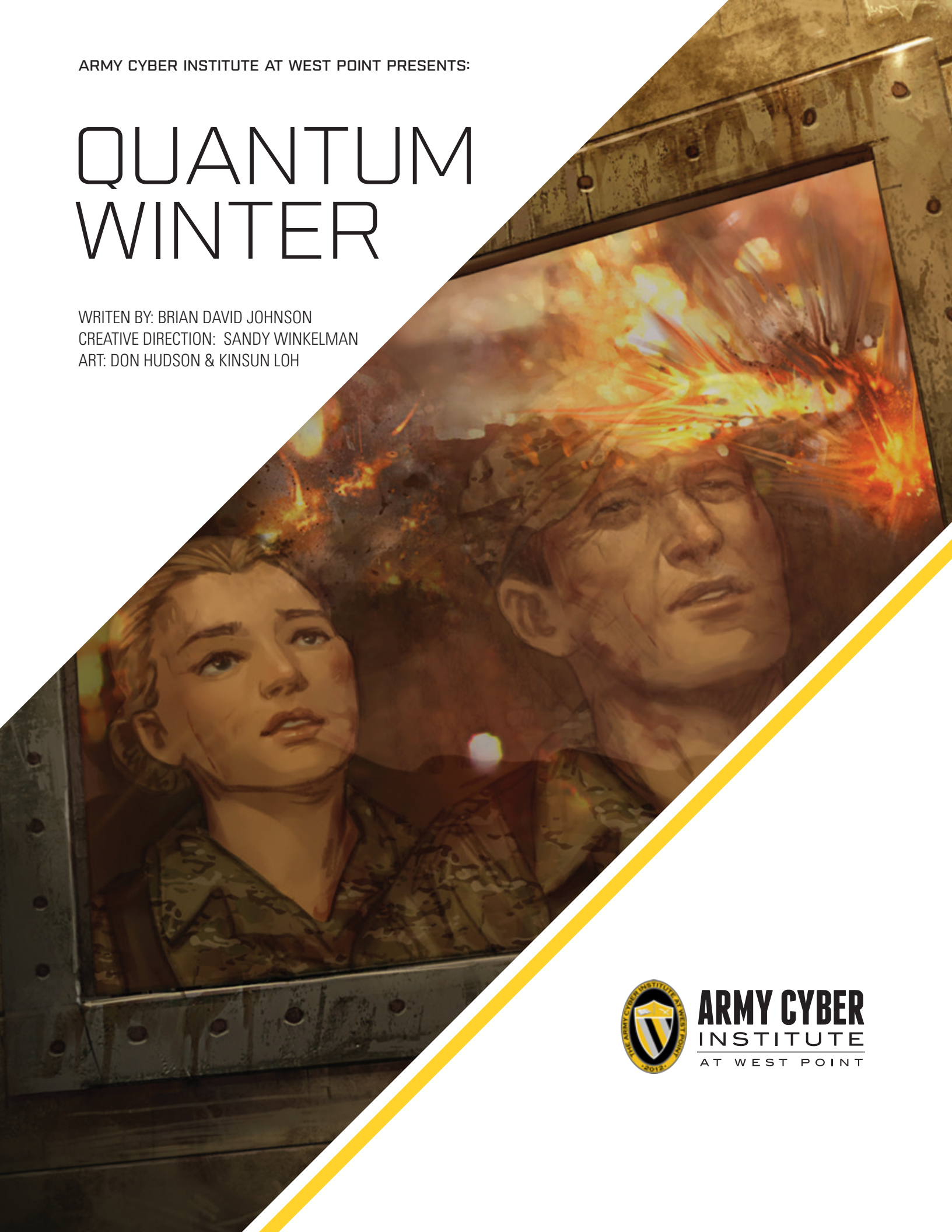
ARMY CYBER INSTITUTE AT WEST POINT PRESENTS:

QUANTUM WINTER

WRITEN BY: BRIAN DAVID JOHNSON
CREATIVE DIRECTION: SANDY WINKELMAN
ART: DON HUDSON & KINSUN LOH



ARMY CYBER INSTITUTE AT WEST POINT

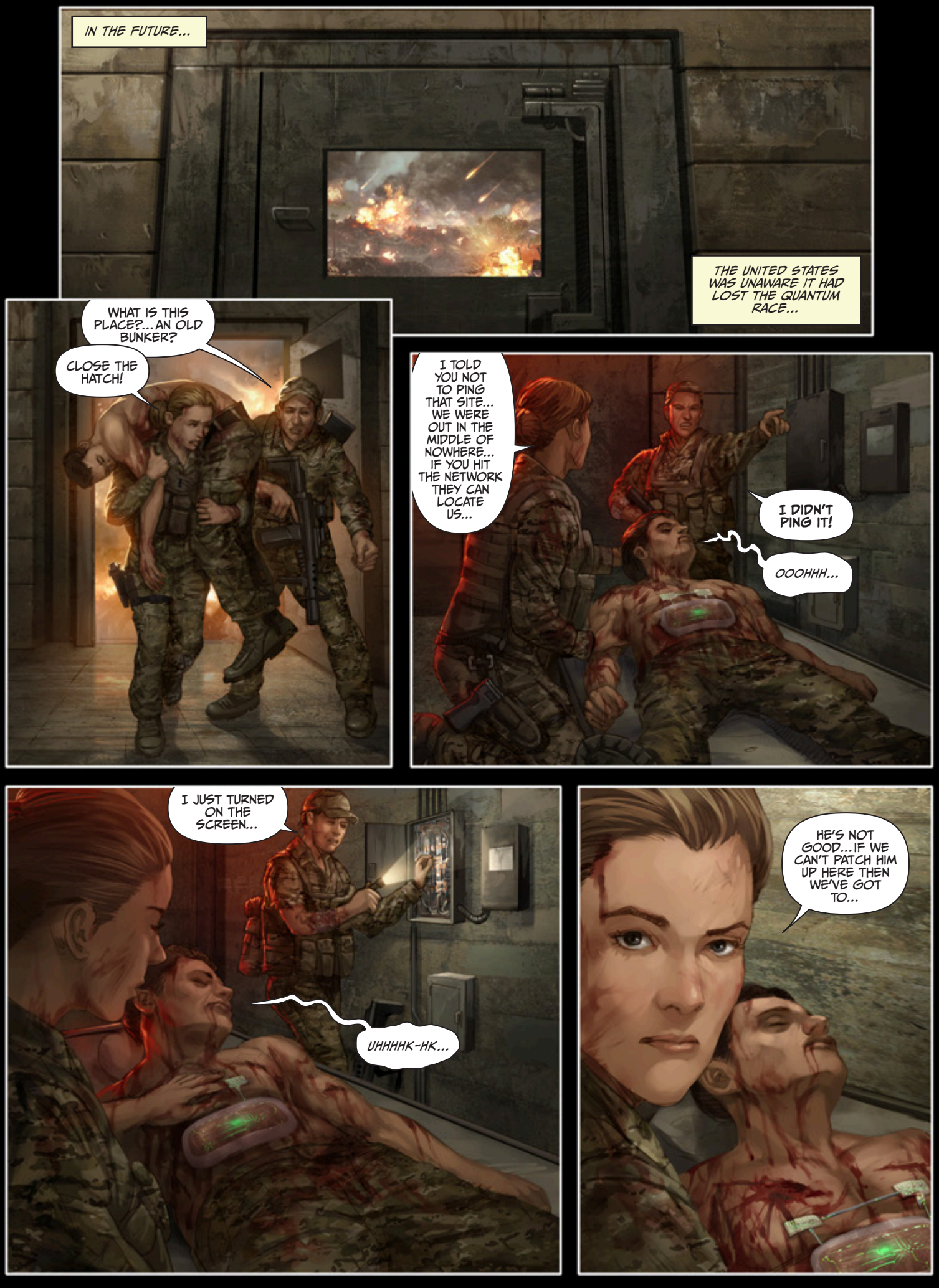
BUILDING A BETTER, STRONGER AND MORE SECURE FUTURE FOR OUR ARMED FORCES

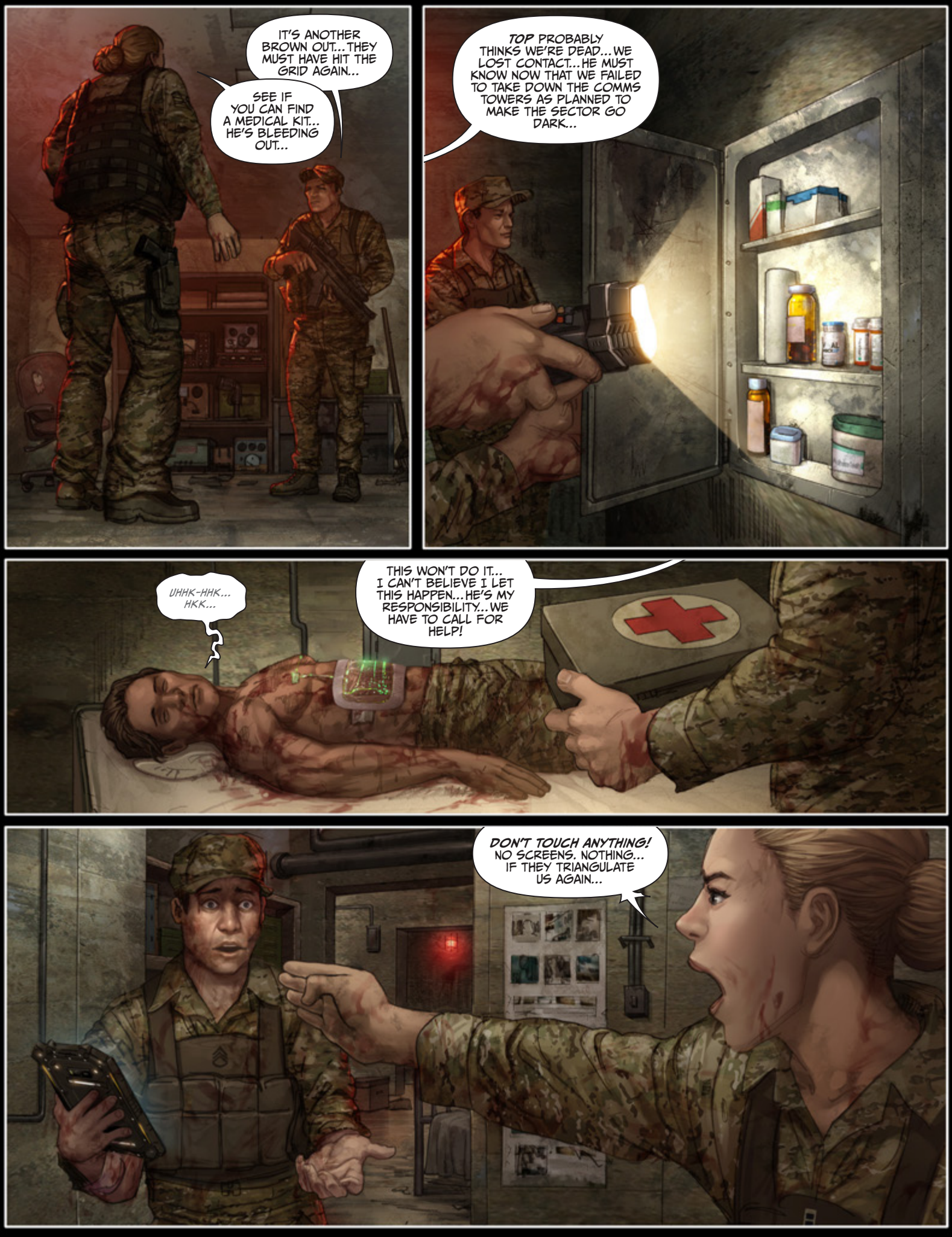
Science Fiction Prototypes are science fiction stories based on future trends, technologies, economics, and cultural change. The story you are about to read is based on threatcasting research from the Army Cyber Institute at West Point and Arizona State University's Threatcasting Lab. Our story does not shy away from a dystopian vision of tomorrow. Exploring these dark regions inspires us to build a better, stronger, and more secure future for our Armed Forces.

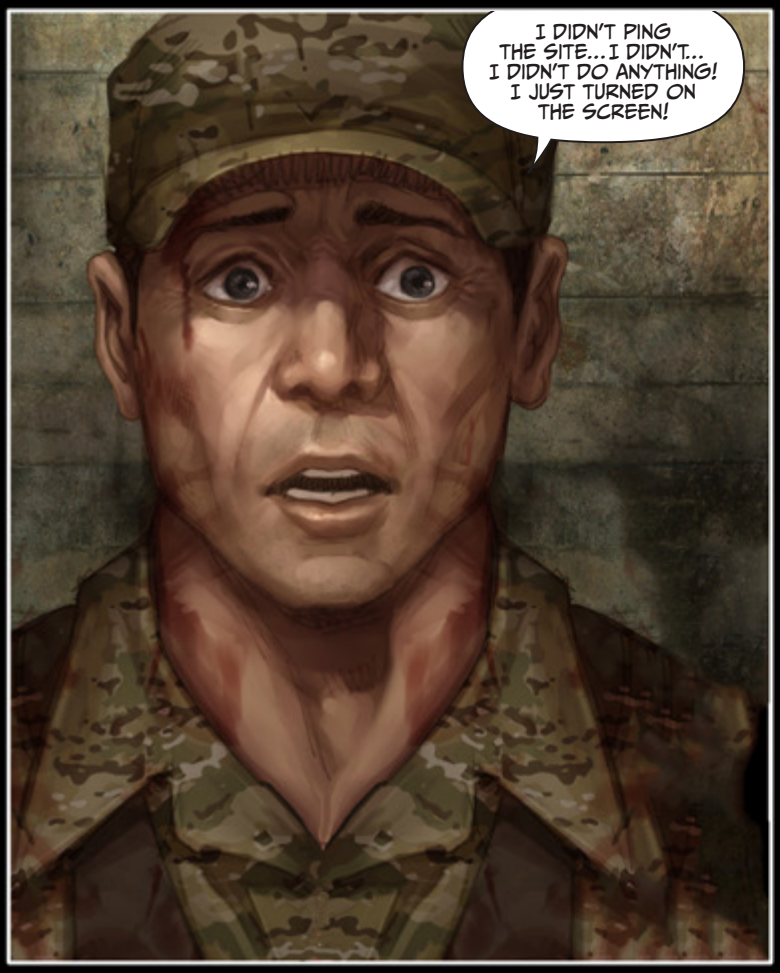
Lt. Col. Natalie Vanatta
Academy Professor
U.S. Army Cyber Institute

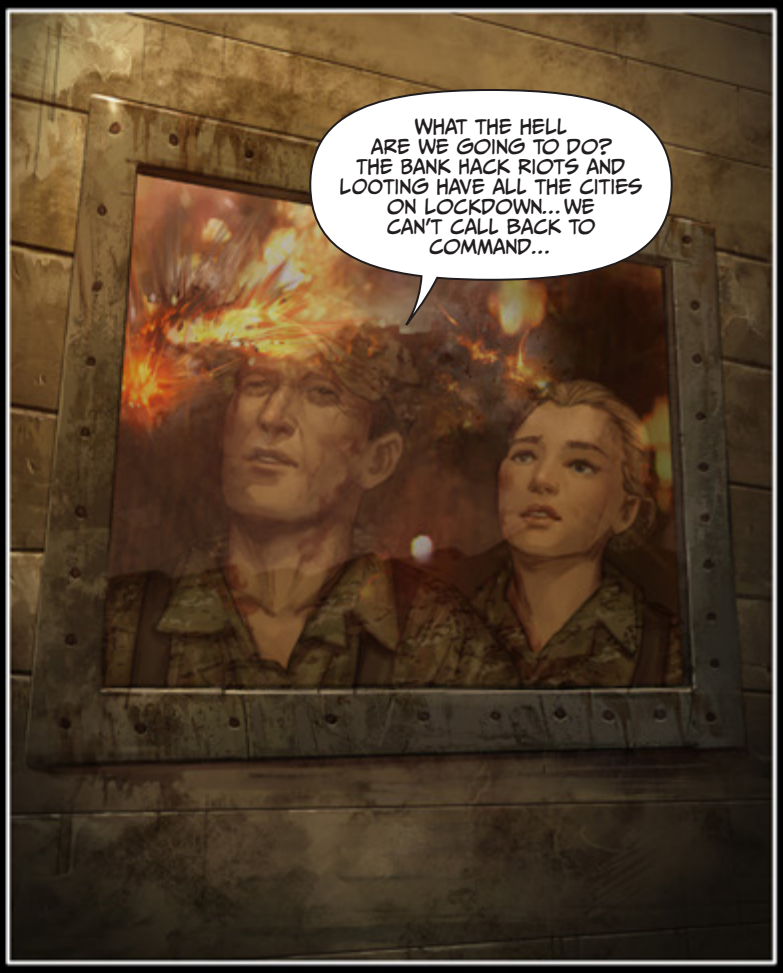
QUANTUM WINTER

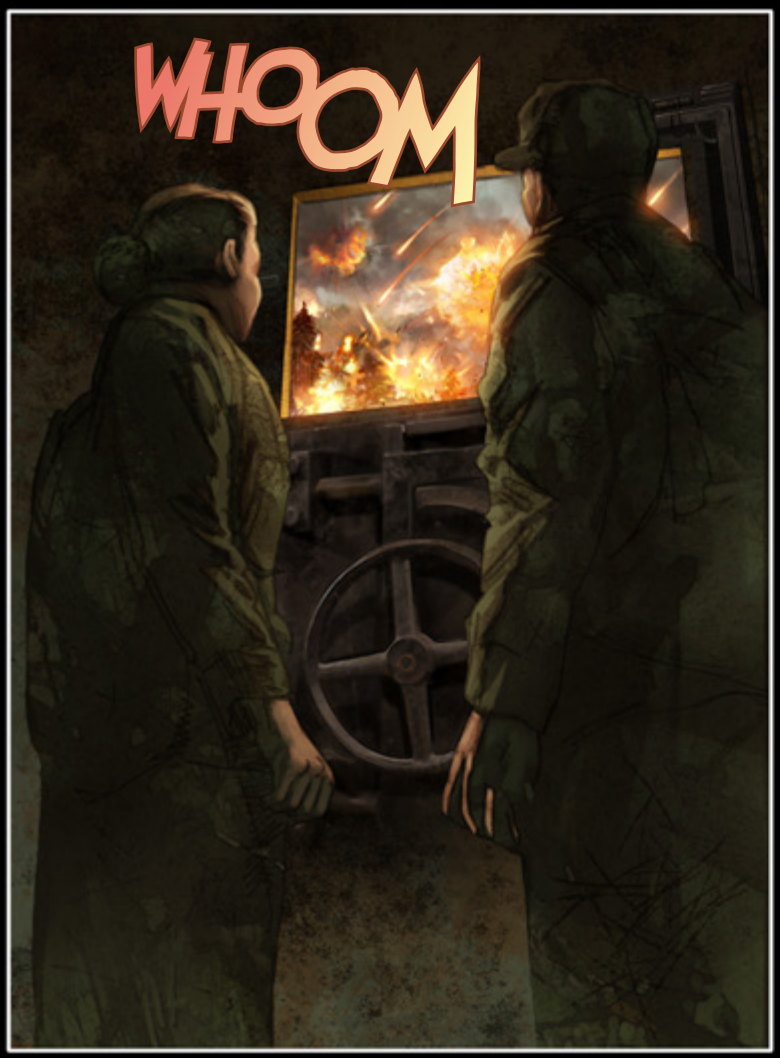
Adversaries have beaten the U.S. to the punch, acquiring quantum computing capabilities well ahead of the technological world's expectations. The ramifications of the enemy's advantage in computational power are felt by a team of U.S. Army technical soldiers during a tactical mission. The team suffers the chaotic effects of the enemy's advantage, leaving them immobilized by enemy fire and unable to communicate for fear of being more precisely located. Outside, the nation's power grid is under constant cyber attacks, producing persistent rolling brown outs. With no encryption, banking systems are hacked, destabilizing the economy and inciting civilian riots in major urban centers. The nation is frozen in a "quantum winter," unable to defend itself, experiencing the prolonged effects of losing the technological race in computational power.

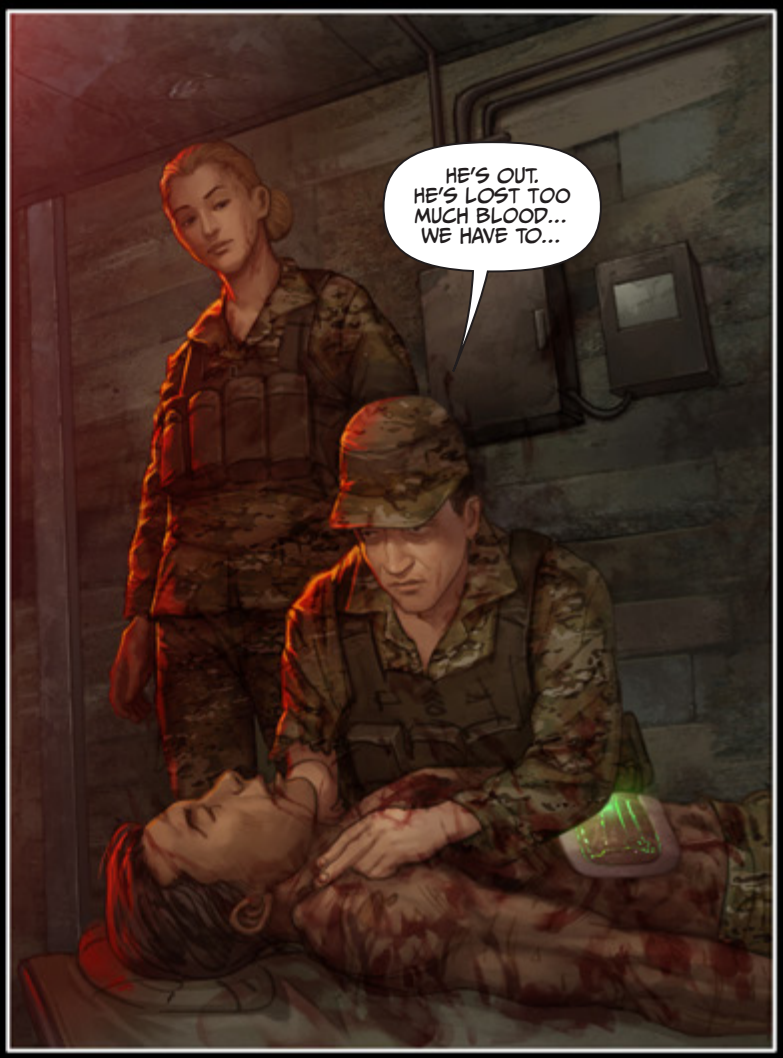

IN THE FUTURE...
THE UNITED STATES WAS UNAWARE IT HAD LOST THE QUANTUM RACE...
WHAT IS THIS PLACE?... AN OLD BUNKER?
CLOSE THE HATCH!
I TOLD YOU NOT TO PING THAT SITE... WE WERE OUT IN THE MIDDLE OF NOWHERE... IF YOU HIT THE NETWORK THEY CAN LOCATE US...
I DIDN'T PING IT!
OOOHHH...
I JUST TURNED ON THE SCREEN...
UHHHHK-HK...
HE'S NOT GOOD... IF WE CAN'T PATCH HIM UP HERE THEN WE'VE GOT TO...

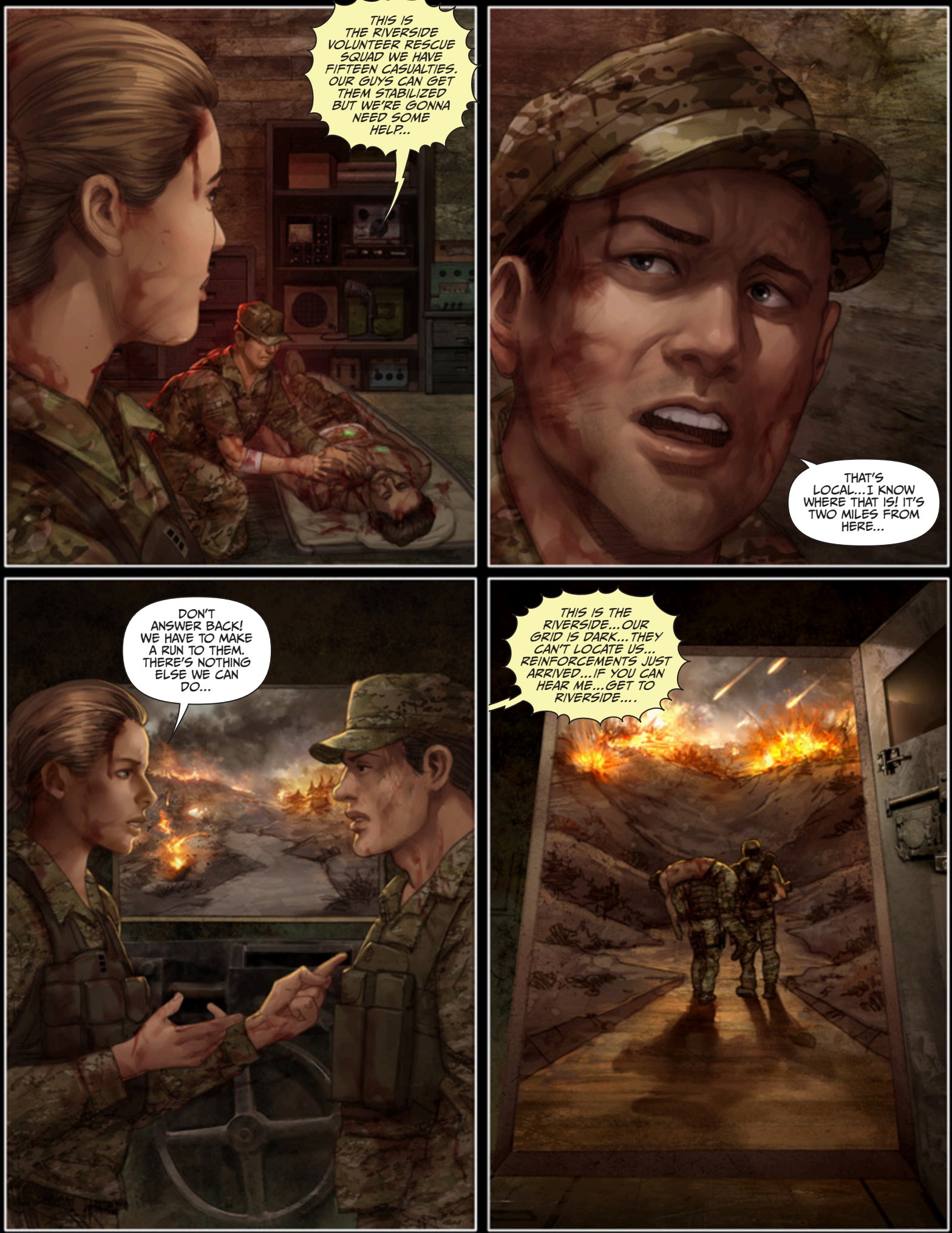

IT'S ANOTHER BROWN OUT... THEY MUST HAVE HIT THE GRID AGAIN...
SEE IF YOU CAN FIND A MEDICAL KIT... HE'S BLEEDING OUT...
TOP PROBABLY THINKS WE'RE DEAD... WE LOST CONTACT... HE MUST KNOW NOW THAT WE FAILED TO TAKE DOWN THE COMMS TOWERS AS PLANNED TO MAKE THE SECTOR GO DARK...
UHHK-HHK... HKK...
THIS WON'T DO IT... I CAN'T BELIEVE I LET THIS HAPPEN... HE'S MY RESPONSIBILITY... WE HAVE TO CALL FOR HELP!
DON'T TOUCH ANYTHING! NO SCREENS. NOTHING... IF THEY TRIANGULATE US AGAIN...


I DIDN'T PING THE SITE... I DIDN'T... I DIDN'T DO ANYTHING! I JUST TURNED ON THE SCREEN!


WHAT THE HELL ARE WE GOING TO DO? THE BANK HACK RIOTS AND LOOTING HAVE ALL THE CITIES ON LOCKDOWN... WE CAN'T CALL BACK TO COMMAND...


WHOOM


HE'S OUT. HE'S LOST TOO MUCH BLOOD... WE HAVE TO...


THIS IS THE RIVERSIDE VOLUNTEER RESCUE SQUAD WE HAVE FIFTEEN CASUALTIES. OUR GUYS CAN GET THEM STABILIZED BUT WE'RE GONNA NEED SOME HELP...
THAT'S LOCAL...I KNOW WHERE THAT IS! IT'S TWO MILES FROM HERE...
DON'T ANSWER BACK! WE HAVE TO MAKE A RUN TO THEM. THERE'S NOTHING ELSE WE CAN DO...
THIS IS THE RIVERSIDE...OUR GRID IS DARK...THEY CAN'T LOCATE US... REINFORCEMENTS JUST ARRIVED...IF YOU CAN HEAR ME...GET TO RIVERSIDE....

AFTERWORD

Institutions within nation-states continue to aggressively pursue the achievement of quantum supremacy. Most of these endeavors aspire to solve some of the world's most difficult mathematical problems. One thing holds true, whichever nation possesses "quantum supremacy" first has the capability to shift global hegemony in their favor. Quantum computing gives the U.S.' adversaries the capability to crack the most sophisticated encryption algorithms, protecting our national security information. This capability will enable its possessors to wreak chaos and havoc on the information networks of any nation that opposes its will.

What can the U.S. do to assure the security of information contained within our national information infrastructure if we lose the quantum race? How do we pursue encryption research designed to address information security in the "post-quantum" world? What battlefield systems could be emplaced to counter the effects of a "quantum winter" from enemies possessing this advantage?

As illustrated in this story, enemies with quantum computing capabilities could render U.S. military units completely isolated, confused, and powerless. The need to develop new "quantum proof" encryption algorithms has never been greater. While quantum computing promises a lot of good for the world, it also poses an existential threat to our national security.

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