



Security Nexus Perspectives

# GAMING MAJOR POWER RIVALRY AND CLIMATE DISASTERS USING SYSTEMS TOOLS

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## ABSTRACT

In a world where crises and disasters are increasing in frequency and intensity, few options exist to facilitate an adequate understanding of the underlying complex causal factors and driving forces. Fewer yet exist that permit us some insight into the potential and plausible future outcomes of these events. This paper describes the development of four crisis-games through a process involving threat identification, systems mapping, analysis of the driving forces of change, and foresight-based scenario planning. The crisis-games cover the topics of major power rivalry threats in northeast Asia and climate-environmental threats in the Indo-Pacific over mid-term (15-year) and long-term (50-year) periods. Two of the most interesting insights were: i) technology is evolving so fast that is difficult to imagine what the long-term future might hold; and ii) people mitigate existential environmental change by prioritizing economic improvement to provide more options in the future. Similar themes emerged in all groups, including the value of multi-mindedness in evaluating complexity, difficulties in committing to collective action with imperfect information, identification of core values and interests in geopolitical negotiations, and insights into possible levers of influence.

Keywords: Systems mapping, strategic foresight, Geopolitical, environmental, wargaming, decision-making, crisis management

## Introduction

Well-functioning security systems are vital to sustaining and expanding the management of national challenges. However, the inherent complexity of many types of crises places decision-makers in the uncertain position of having to make difficult choices with limited information. Other factors, such as urgency, growing threats, and increasing pressure from stakeholder groups, the media and public, all interact to expand situational complexity. Crises seldom provide managers the time they need to conduct

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an extensive analysis to understand the problem, and so, familiarity with rapid and easy to use analytical methods is essential to ensure a higher proportion of appropriate decisions.

Preparedness is the key to facilitating rapid, evidence-based decisions during acute crises. The work environment of a national security professional constantly evolves, and errors in judgment can result in significant impacts on crisis responders and communities. Maintaining the peace and keeping in front of problems requires an understanding of relationships, collaborative thinking, and awareness of system complexity. Several methods and tools exist that can help decision-makers understand complex problems before they tip into chaos. Having an idea of how these problems might change in the future and what people might do in these situations is key to averting disastrous ripple effects.

Each year, several five-week long-courses are conducted by the Daniel K. Inouye Asia-Pacific Center for Security Studies (DKI APCSS). Each course conveys the content first via theoretical material, then by relating practitioner experiences to theory, and then by providing participants the opportunity to explore the content through exercises, negotiations, and games. Participants spend a good deal of time identifying threats, understanding the systems that allow them to emerge and propagate, determining the underlying driving forces, and gaining management insights through foresight exercises and crisis-gaming.

There is little value in an exercise in which participants face a problem and follow a linear process to resolve it, because it bears no resemblance to reality. A more complicated situation can be created by adding multiple issues that require attention, but this does not introduce complexity. Role-playing, on the other hand, adds an element of complexity by prompting participants to explore the effects of interests and priorities on linear processes. However, this is also not representative of reality because it only presents benign opposition in the form of different positive, desired end states. It works well in an imaginary, un-Machiavellian world that contains no unknown, unpleasant surprises, that assumes everyone's motivations are good, and that asserts that a win-win outcome is always possible. It also is highly exposed to groupthink and sub-par outcomes.

Red Teaming is often used to resolve this dilemma through the use of "structured tools and techniques to help us ask better questions, challenge explicit and implicit assumptions, expose information we might otherwise have missed, and develop alternatives we might not have realized exist."<sup>1</sup> The method builds mental agility through self-awareness and reflection, mitigates groupthink, fosters cultural empathy, applies critical thinking, and employs multiple perspectives to improve understanding and option generation.

Wargaming and crisis-gaming take this to another level. They work on challenging and complex problems by introducing adversarial role-players who have very different motivations, values, and goals. These 'Red' players continually challenge the 'Blue' players who are trying to fix problem by reacting in unpredictable ways, by introducing the element of uncertainty, by challenging biases and assumptions, and by introducing various levels of emerging and evolving threats. Random event generators, such as dice, can be used to enhance the likelihood of unpredictable outcomes.

This paper documents a methodology for creating crisis-games that are designed to explore possible futures in the medium and long-term. It describes a four-step process in which security practitioners work on understanding threat systems, delve into the related underlying driving forces of the threats, create future scenarios in which these forces interact and play out, and explore these scenarios using adversarial crisis-games.

### Context, Facility and Participants

DKI APCSS is an executive education institution that offers courses for experienced security practitioners from over 35 countries in the Indo-Pacific. Fellows collaborate in a shared learning environment on issues like advanced security cooperation, comprehensive crisis management, and countering violent extremism. DKI APCSS offers its Fellows a high-tech educational facility with an auditorium, a large lecture hall, and a dozen 16-person breakout rooms with four whiteboards, a smartboard, and two 50” screens.

In the case assessed by this paper, participants (Table 1) were separated into eight groups of 12 to 13 people. Each group had only one person from each country and proportionately distributed genders. Two faculty members facilitated process and discussion for each group in dedicated breakout rooms.

**Table 1:** Participant details

Total participants	101
Origins 89% international 11% U.S.	36 (Australia, Bangladesh, Bhutan, Cambodia, Colombia, Fiji, Hong Kong, India, Indonesia, Iraq, Republic of Korea, Laos, Lebanon, Malaysia, Maldives, Marshall Islands, Mexico, Micronesia, Mongolia, Myanmar, Nepal, New Zealand, Nigeria, Papua New Guinea, Peru, Philippines, Solomon Islands, Sri Lanka, Taiwan, Thailand, Timor-Leste, Tonga, Turkmenistan, United States, Vanuatu, and Vietnam)
Organizations	4 (Japan Platform, Myanmar Red Cross, Pacific Islands Forum, United Nations Office for the Coordination of Humanitarian Assistance (UNOCHA))
Gender	71% male, 29% female
Profession	33% Major to Colonel; 10% Police equivalent; 57% Civilian equivalent to O3-O5 military officer rank with several directors of national disaster management organizations
Game staff	Four people were involved with game design. Game preparation was assisted by a few staff from the DKI APCSS Visual Information unit. Game training was facilitated by the 2-person course management team. Each crisis-game was run by an experienced facilitator with the assistance of a scribe





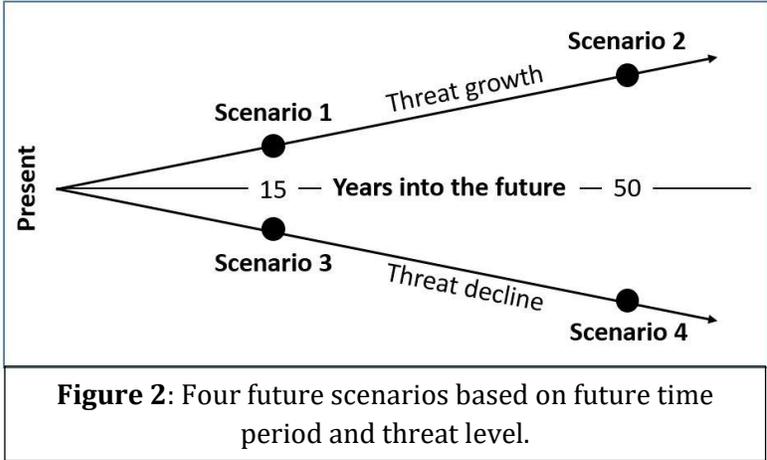
# Gaming Major Power Rivalry and Climate Disasters Using Systems Tools

1970's to guide decisions in times of uncertainty, to overcome cognitive limitations and to improve mental agility.<sup>5</sup> In practice, it brings together managers with stakeholders to generate insights as they explore the implications of alternative futures.<sup>8</sup> Likewise, crisis managers find scenario planning a useful tool for managing uncertainty, risk, and opportunity because it provides a framework for understanding future needs and prioritizing near-term actions.

Scenario development requires consideration of how each of the change drivers and relevant system factors might behave under each scenario. The simplest and most commonly used approach to scenario creation is to use a two-way matrix that derives from contrasting the two most powerful or disruptive drivers. This ensures that participants explore a range of plausible, but distinct alternative futures.

In Step 3, participants created two-way matrices comprised of medium and long-term time periods vs. threat growth or decline. The two-way matrices produced four distinct scenarios for analysis (Figure 2). Each group then divided into two subgroups to develop each of the four scenarios.

Participants were asked to pretend that they were living in their assigned future scenario and brainstorm what it looked like. They considered the success or failure of social, technological, economic, environmental and political (STEEP) drivers and reflected on the possible changes that each driver might cause. Taking all factors into consideration, they selected four of the most relevant and highest-ranked driving forces and listed associated actors for each driver (Table 4).



**Figure 2:** Four future scenarios based on future time period and threat level.

**Table 4:** Word clouds of drivers considered in each of the four scenarios by the seven groups.

Scenario 1 Threat growth in 15 y	Scenario 2 Threat growth in 50 y	Scenario 3 Threat decline in 15 y	Scenario 4 Threat decline in 50 y
<p>Consumerism, Social media, Instability, Social tension, Aid, Bad governance, Migration, Industrialization, Innovation &amp; AI, Resource exploit, Int'l law, Instability, Investment &amp; Trade, Urbanization, Aid, Economic downturn</p>	<p>Bad governance, Technology, AI &amp; Energy, Unstable, Climate change, Unstable, Investment, Social tension, Instability, Cyber, Climate change, Int'l tension, Resource scarcity, Investment, Int'l tension, Social media, Int'l tension, Technology, AI &amp; Energy, Cyber, Urbanization, Resource scarcity, Int'l tension, Investment, Social media, Cyber, Investment, Cyber, Climate change, Int'l tension, Social media, Cyber, Int'l tension, Social media, Cyber, Int'l tension, Technology, AI &amp; Energy, Social tension</p>	<p>Intl law, Technology laws, Social harmony, Open trade &amp; consumerism, Enforced legislation, Interagency + diplomacy, Sustainability, Resources, Defense, Good governance, Resources, Defense, Good governance, Education, Intl harmony, Sustainability, Resources, Defense, Good governance, Technology, Intl law, Enforced legislation</p>	<p>Cyber war, Legislation + safeguards, Good governance, Int'l &amp; Cyber law, Connectivity, Cyber war, Energy tech, Infrastructure, Legislation + safeguards, Technology + AI, Deurbanization, Multilats, Technology + AI, Open trade, Open trade, Energy tech, Sustainable, Open trade, Sustainable, Good governance, Energy tech, Multilats, Int'l &amp; Cyber law, Social security, Multilats</p>

### Step 4: Crisis-games based on foresight scenarios

Among the best ways to conduct futures research is through the experience and analysis of serious games.<sup>9</sup> Repetition of a serious game with diverse participants can be very effective in revealing alternative futures.

While this technique does not provide a prediction of the future, it permits a glimpse of what may occur, which aids decision-makers in identifying the potential effects of policies in advance.

Matrix games are a type of crisis-game that can involve local to global issues, be tactical, operational or strategic, and range from a serious-game to a wargame.<sup>10</sup> However, Matrix games are different from typical wargames in that there are fewer limitations on player behavior, the decision-making is crowd-sourced, the adjudication process is transparent, and the gameplay rarely produces clear winners or losers. These crisis-games employ a broad range of political, social, military, and economic dimensions and are particularly useful for analyzing complex geopolitical issues involving multiple stakeholders with different goals, strategies, motivations, and values. Such issues include potential hostilities, diplomatic standoffs, transnational threats, and geopolitical negotiations. Their purpose is to expose participants to broad perspectives, test strategies, identify key issues, and promote the exchange of ideas. Their output tends to be a qualitative narrative and interpretation rather than a quantitative prediction. They are thus useful when the game space is not well understood.<sup>11</sup>

After reviewing the participant's work in Steps 1 to 3, the authors selected the two most commonly mentioned themes for scenario development and characterized them as: "Major Power Rivalry in Northeast Asia" and "Climate and Environmental Change in Asia and the Pacific." In an effort to gain insight into medium and long-term futures, different briefs were developed for 15 and 50 years into the future. The scenario briefs were developed over many meetings with the game designers, who used participant outputs like pieces of a puzzle to craft matching storylines. Each of the four resulting scenarios was used as the foundation of a Matrix-style crisis-game.

### **Matrix Game Outcomes**

This paper only reports on the outcomes of the two 15-year scenarios. In the section below, the two detailed Scenario Briefs are presented followed by summaries of what the actors actually did in the games. Outcomes are the actual moves of each actor in the crisis-game. Some moves are made to achieve strategy, while others are often reactive in response to other actor moves. There were two games played for each of the briefs below; thus there are two outputs, which are very different.

#### ***Matrix Game 1: Major power rivalry in northeast Asia in 15 years***

##### Scenario Brief

*A rebellion broke out in North Korea, and the people overthrew President Kim Jong Un's government. North Korea and South Korea united in a search for co-prosperity and founded the Federated States of Korea (FSK). The FSK halted denuclearization, became a world nuclear power, and rapidly developed into an economic giant due to cheap labor in northern Korea.*

*Working behind the scenes, China manipulated the eviction of the U.S. from the FSK and Philippines. However, this backfired when FSK turned to Russia for assistance, aid, and close diplomatic ties. To maintain influence in the region Japan disregarded Title IX and began a massive military buildup with the help of the U.S. The U.S. and Japan strengthened diplomatic ties, and the U.S. spearheaded international support for Japan.*

*China pushed forward to complete their One Belt, One Road Initiative. Asia and Europe are now connected, creating a flow of economic prosperity with China at the center of the network. As China rapidly became the wealthiest nation in the world, a huge gap developed between the minority rich and majority poor. Riding the momentum of progress, and in a Blitzkrieg-like move that took the world by surprise, China took a bold step and annexed Taiwan to advance their sovereign rights and secured the South China Sea once and for all.*

### Outcomes Game 1a

Russia actively establishes military technology trade agreements with China, and improves relationships with a united Korea and Japan, but ends up deploying troops on their Korean border. Korea denuclearizes in exchange for U.S. security umbrella, but also trades with China in exchange for humanitarian assistance and relief. It ends with a U.S. treaty and welcomes U.S. troops back to the peninsula. Japan hosts an exercise with Korea and the U.S. near Chinese borders, and makes trade agreement with Korea and the U.S. Taiwan conducts maritime exercises with U.S. and Japan and makes moves towards independence. This culminates with an influence campaign in China to support independence. China is fairly unsuccessful in moves, but does end up deploying forces to retake Taiwan.

### Outcomes Game 1b

China increases Korea's dependency by providing aid, loans, and establishing a defense treaty. Korea builds up military and nuclear power with Russian help and puts a military presence on Dokdo Islands. Korea ends by reducing diplomatic ties with China. Russia arbitrates peace between Korea and Japan, makes a defense treaty with Taiwan, establishes bilateral trade with Japan, and a Russian becomes UN Secretary General. Japan hosts more U.S. troops, breaks Taiwan away from China with U.S. help, and builds an alliance with Korea and Russia. Taiwan implements economic reforms with help of U.S. and Japan, signs a bilateral economic treaty with Korea and builds military with U.S. help. The U.S. takes control of the South China Sea away from China, conducts cyber-surveillance against Russia, and removes China from the UN Security Council.

### ***Matrix Game 2: Climate and Environmental Change in Southeast Asia and the Pacific in 15 years***

#### Scenario Brief

*Over the past 15 years, the sea level has risen by a meter (3 ft). Weather events and flooding in most coastal cities are becoming increasingly destructive. Worsening climate conditions have driven mass migration and the cost of housing, food, and transportation are rising as resources become scarce.*

***China:*** While maintaining the largest economy in Asia, China's growth slowed to 4.8% this year due to rising energy prices and an aging workforce. Chinese companies and universities are globally recognized technology innovators. Their research produced breakthroughs for cleaning the atmosphere, cutting down greenhouse gas emissions, and restoring the ozone layer. However, China's use of new technologies like automation and artificial intelligence have increased unemployment in all sectors of its economy.

***U.S. Global Corp:*** Corporations wield unprecedented influence in international politics, with many holding assets equal to mid-sized countries. Five of the largest companies are in China. Business leaders influence policymakers through lobbying and coercion. The U.S. Corp in the Indo-Pacific represents U.S. corporate interests in the region. The organization sponsors development in Indonesia, the Philippines, and Papua New Guinea, and competes with China for access and influence in the Indo-Pacific.

***Papua New Guinea:*** Rising oil and gas prices have resulted in robust economic growth. While Australia remains a major player, China invests heavily in PNG and is the largest purchaser of their resources. China equips and trains local security to protect its many infrastructure projects. PNG was recently accepted as a member of ASEAN. However, its relationship with the ASEAN Chair, Indonesia, remains rocky due to disagreements over West Papua.

***Philippines:*** The Philippines is experiencing severe food shortages due to increased tropical storms, flooding, and the loss of agrarian land. Ocean acidification has reduced the Pacific Ocean's fish supply, thereby raising the price of food. Manila often suffers from flooding, and businesses have begun to leave. The Philippines has a young, capable and multilingual workforce, with many finding work abroad and sending remittances back

home. In the face of climate change, the Philippines urgently needs outside economic support, and many U.S. Corporations invest in the country.

**Oceania:** With rising sea levels, many islands have become uninhabitable. New Zealand and Australia have received several waves of migrants. Both countries would like PNG to absorb a portion of those migrants. New Zealand and Australia formed a federated state called “Oceania” which is concerned about the rising influence of China, but it blames transnational corporations for driving climate change.

**Indonesia:** Indonesia has seen massive growth in both its economy and population. It has positioned itself at the center of ASEAN and is this year’s ASEAN Chair. The country also regularly attends Pacific Island Forum meetings as an observer. However, increasing urbanization and pollution, along with a growing population, have reduced the available agrarian land in Indonesia. Lower yields in rice lead to frequent food shortages. In response, Indonesia has increased its economic presence in West Papua.

### Outcomes Game 2a

While China vacillates on technology deals, it works with U.S. and Oceania on counterterrorism and provides military assistance to Oceania nations that experience climate-based disasters. U.S. Corp helps diversify the economies of Oceania, Philippines, and Indonesia by investing in agriculture, fisheries, education, energy, and industry. The U.S. Govt. gets U.S. companies to reduce CO<sub>2</sub> emissions initially, but later, U.S. Corp succeeds in getting U.S. and China to lower CO<sub>2</sub> emissions targets even further. Indonesia increases resource development in West Papua and when they experience a disaster, PNG provides aid to Indonesia and accepts Pacific refugees.

### Outcomes Game 2b

PNG signs free labor movement agreement with ASEAN, hosts land/naval military exercises with U.S., Japan, S. Korea, the Philippines, Thailand, becomes a tourist hotspot and regional flight hub, and purchases two squadrons of sixth-generation fighters from U.S. Corp. The Philippines and U.S. have a wildly successful oil/gas venture in the disputed South China Sea, and the Philippines permits the U.S. to reopen a military base on Luzon, Philippines also works with China on pollution mitigation and sustainable farming technology. Oceania convinces transnational corporations to build floating islands in the Pacific and declares Oceania a nuclear weapon-free zone. U.S. Corp provides 65% of artificial island costs. Oceania then partners with U.S. Corp to build fisheries, but U.S. Corp takes 65% so it raises the cost of fishing licenses. China helps Oceania reinvigorate and protect its Great Barrier Reef. Indonesia buys ten, sixth-generation fighters from U.S. Corp, reduces pollution, and successfully influences the world to address climate change. Indonesia plays both sides. It runs separate exercises with U.S. and China. It works with the U.S. Govt. on agriculture and urban modernization, and with China on mining and alternative energy research and development. Indonesia agrees to a Chinese naval base in West Papua, and sets up a joint infrastructure project in West Papua with China receiving favorable mining rights. Finally, Indonesia pushes automation and AI in West Papua with U.S. support. China is very active throughout with a successful mining operation on the Spratly Islands, a new space station with global environment monitoring capabilities, and a joint project with U.S. Corp on exploring and exploiting of minerals in space.

### **Participant Takeaways**

Following five rounds of gameplay, participants were given 45 minutes to reflect on lessons and takeaways from the game. Most participants enjoyed the experience and felt that it added significantly to the course. The ensuing discussion brought out similar themes across all groups, including the value in multi-mindedness in evaluating complexity, difficulties in committing to collective action under imperfect information, identification of core values and interests in geopolitical negotiations, and insights into

possible levers of influence. Players also provided facilitators with candid feedback for improving future iterations of the game.

Some participants lamented about their limited knowledge of some of the countries in the game. In this format, with eight games running simultaneously, it was not possible to provide additional subject matter experts to supplement knowledge deficits. However, this was not necessarily a problem because prior experience is not essential when people are asked to solve new problems.<sup>12</sup> Faced with new situations, such as novel player moves, experts may fail to recognize when their expertise becomes irrelevant.<sup>13</sup>

Ultimately, players observed that national interest takes priority and that military power is still a dominant factor on the international stage, regardless of economic status. The game mechanics ensured that “every dog had its day” and that everyone experienced Murphy’s Law (what can go wrong will go wrong) as their strategic planning continuously failed when exposed to the transparent decision-making environment.

### PERSPECTIVE

Most reflections on the games addressed issues with understanding other stakeholder perspectives. Participants noticed the presence of many different opinions that they related to different job positions or country positions and the influence of media. Some noted the value in hearing different perspectives on familiar issues and the utility of wearing different hats to examine a problem from different perspectives. Participants noted that the availability of multiple perspectives was effective in countering inaccurate assumptions that can result in ineffective decisions.

### INFORMATION AND RELATIONSHIPS

All decision-makers have to sort through imperfect information that limits their capacity to make fully rational decisions. To mitigate this, the participants used various methods, such as disclosing confidential information, soliciting group feedback, and investigating the unknown. However, they found it very difficult to build trust and noted how hard it was to predict the actions of other actors. While they sought more clarity and completeness of information on the strengths and vulnerabilities of other actors, they realized that these only come with improved mutual understanding and stronger relationships. International negotiations are complex and leaders have a strong influence on meeting dynamics. Thus, having clear strategies and identifying shared and common interests were essential in improving national-level negotiations.

### TECHNOLOGY

Highly-ranked drivers featured in most game moves (economics – 59 moves, international relations – 38 moves, stability – 37 moves, and technology – 23 moves), however, relationship building was more common in the major power rivalry games, and technology was more common in the climate games. The failure of technology to emerge as a powerful force in all but one of the games may have something to do with the nature of the games and/or the knowledge of the participants about such things as cyber warfare options. This category included everything from cyber to military to agricultural technological advances and innovations. An observable difference between 15-year and 50-year game moves in both scenarios was a higher focus on technology in the 15-year scenarios.

Technology is evolving so fast that it was probably difficult for participants to extrapolate or imagine what the long-term future might hold. “The success of a global crisis-game depends in no small measure on assembling in one place people with different talents and backgrounds to confront dynamic and complex issues.”<sup>14</sup>

### ECONOMICS

Insights into the effectiveness of particular actions in creating stability and good relations focused on economics and continuous association. While the value of free economic trade as a precursor of stability and prosperity was obvious, participants also viewed economics as a vehicle that opened up other domains. However, any agreement required adequate commitment and enforcement, otherwise it would fail due to subversion and corruption. Small states recognized their need to bandwagon to become significant economic players but required assistance to do this effectively. While more meetings and dialogues (negotiation time) helped to improve stability and decrease hostilities, they were also viewed as a source of future problems because of improved relationships and the resulting groupthink.

Economic deals were the most common, followed by those that aimed to promote internal and external stability. These included moves relating to a broad range of activities, including governance and public services. While technology and stability drivers were the highest-ranked, economic actions were dominant in the environmental games. These economic actions were mostly trade deals and did not include resilience or preparedness components. This suggests that decision-makers, when confronting this existential topic, may choose to mitigate it by prioritizing improvements in their economy, which opens more options down the track.

### Conclusion

The combination of systems thinking, strategic foresight and wargaming results in meaningful Matrix games that allow participants to experience the politics of dealing with plausible future events in a complex environment. Through this participatory process and transdisciplinary engagement fostered by the foresight games process, players develop a vision and scenarios that show them how to achieve the future they prefer or avoid the future that they do not want.<sup>15</sup> The limited ruleset provides participants the freedom to think outside the box and generate a broad variety of initiatives and responses.

The benefits of foresight gaming extend far beyond engaging course and workshop participants or delivering custom learning outcomes. They are a proven method for amplifying “plurality, diversity, and multiple perspectives, which are essential for understanding and steering through post normal conditions.”<sup>16</sup> Futurists find utility in games and simulations because they “embody some of the core tenets and long-standing practices of futures: systemic, yet playful, inquiry; engaged and collaborative curiosity; and anticipatory action learning through experiential approaches.”<sup>17</sup>

While they have their limitations and are not an exact replica of reality, situational, role-playing crisis-games foster the application of creative and innovative thinking on challenges that cannot be analyzed using conventional statistical methods and provide the opportunity to investigate possible reactions. Before embarking on a potentially precarious course of action, it is useful to have insight into potential command and control issues, as well as actions that may escalate or de-escalate tensions and hostilities. Leaders need methods that not only provide systems-level knowledge, but which actively challenge assumptions, positions, expectations, perceptions, facts, and procedures to improve decision making in multidisciplinary, interagency, and complex settings.

### ACKNOWLEDGEMENTS

Many thanks to Ms. Toni Difante who assisted in the creation of the major power rivalry future scenario briefs and the many faculty, staff and interns who assisted as group facilitators.

## DISCLAIMER

*The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Daniel K. Inouye Asia Pacific Center for Security Studies, the RAND Corporation, the Department of Defense, or the U.S. Government.  
September 2020*

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