

MITCHELL INSTITUTE
for Aerospace Studies



Space Superiority Through the Spectrum of Conflict

Findings and Recommendations from the
Conflict in Space Workshop

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Why this workshop?

- In 2025, US Space Command and Space Force released documents describing aspects of conflict in space
- The U.S. acknowledges ongoing jamming, lasing, and cyber attacks against its space capabilities, but have not declared this as conflict—is there a tipping point?
- We know space superiority will be critical across the spectrum of conflict, but do not know how it will evolve

Workshop Purpose:

- Inform the understanding of what defines conflict in space
- Examine how conflict in space might manifest
- Identify what effects and conditions the U.S., its Allies, and Partners should prioritize to achieve space superiority throughout the spectrum of conflict

Specific objectives:

1. Characterize the context, severity, and interpretation of a series of vignettes
2. Identify information needed to shape response options
3. Identify potential courses of action for each inject
4. Identify key factors to evaluate courses of action
5. Examine how Allies perceive the actions adversaries and the United States; and identify how they can enable to execution of additional options





Levers/Variables in Vignette Design

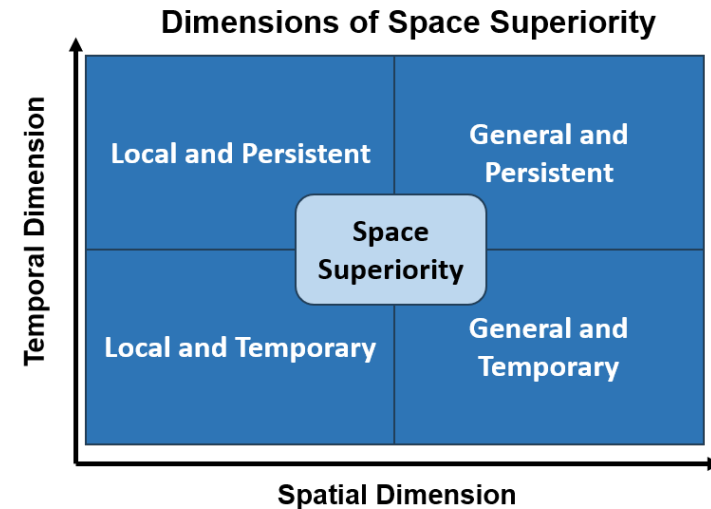
Peaceful Competition & Rivalry

Gray Zone Activities

Threshold Events/Acts of Hostility

Full Conflict

- Mission attacked (Comm, PNT, MW, Weather, Space Superiority, Launch, etc.)
- Location attacked (Space, Ground, Spectrum)
- Type of weapon used (Cyber, EW, Kinetic, Nuclear)
- Effects of attack (local, widespread, loss of life or not, collateral effects)
- Relation to hostilities in other domains
- Level of attribution and who conducted attack



These levers served as the framework for the workshop



Vignette Construct

	D=0	D=45	D=60	D=90	D=180
	Vignette 1	Vignette 2	Vignette 3	Vignette 4	Vignette 5
	Show of force	Non-kinetic	Loss of life	Significant terrestrial hostilities	Widespread destruction
INDO-PACIFIC	China Live-Streams repositioning of a recently inoperable European commercial satellite without prior coordination with owner or host nation	Increased jamming, lasing of U.S. satellites over China (local, temp, non-kinetic)	Direct ascent ASAT test/demonstration with debris that damages ISS, killing a U.S. astronaut and positioning of satellites near U.S. systems (or reversible kinetic against missile warning in geo)	Attempted overwhelming strike, GBL using increased power to damage, co-orbitals engage, massive jamming over Western Pacific to aid invasion of Taiwan	***Unattributed*** NUDET in LEO
EUCOM		Russia increases force presence in Belarus. Cyber attack against multiple commercial comm sats over Europe impacting U.S. military operations (general, temp, non-kinetic)	GPS Jamming Across Europe impacting commerce, communication, navigation, resulting in a mid-air collision including a U.S. airliner	Co-orbital kill of ISR platform in LEO (general, persistent, kinetic) in conjunction with invasion of Latvia	
CENTCOM		Regional GPS jamming disrupting airlines in region (local, temp, non-kinetic)	Iran conducts massive missile attack against U.S. based in Middle East. Several personnel killed and wounded. Facility destruction includes satcom antennas	Saman-1 used to re-enter a satellite from LEO and other satellites as brute forces co-orbital ASATs. Iran invades Iraq.	
NORTHCOM		***Unattributed*** Cyber attack takes down power and disrupts communication in Midwest (including CO) (temporary, general, non-kinetic)	***Unattributed*** Supposed-SOF explosions against all bridges connecting the mainland with Cape Canaveral; East Coast launch operations at a halt	***Unattributed*** A submarine launched a volley of 20 conventional ballistic and cruise missiles at Naval Base San Diego, Nellis AFB, Vandenberg SFB, Beale AFB, and Fort Irwin	



Initial Findings (1 of 3)

- **Complexity**: The topic of conflict in space proved more complex than many participants anticipated
 - Thinking on what constitutes conflict in space is still evolving and there are few clear and internationally agreed to definitions
 - Space conflict crosses geographic areas of responsibility, requires application of all instruments of national power, and military power from all domains
 - Establishing “red-lines” could provide clarity, but risks limiting decision space in future scenarios and incentivizing adversaries to engage just short of red-lines
 - **Impact**: National responses to hostile acts appear ad hoc and reactionary, ceding initiative to adversaries
- **“Boiling a frog”**: Lack of international norms and defined consequences for aggressive norm setting behavior creates conditions fostering escalation
 - Frequent non-kinetic attacks and “tests” have raised U.S. tolerance, desensitizing us to hostile actions that could rapidly escalate
 - Seizing the initiative requires shaping the battlespace prior to conflict
 - **Impact**: Proactive gray zone activities today can prepare a favorable battlespace



Initial Findings (2 of 3)

- **Adversary Cooperation**: Adversary nations acting in concert significantly elevated the perceived level of hostility of their actions
 - Adversary actions gain greater legitimacy when their partners supported hostile actions in the gray zone
 - The consequences of simultaneous--orchestrated or serendipitous--adversary actions are raised because of the impacts to multiple crises or conflicts
 - **Impact**: space superiority options became more complex and escalation control became more complicated with adversary alliances, risking global conflict
- **Attribution**: The ability to attribute hostile actions was essential to formulate response options and build a coalition response
 - Shared understanding is critical to achieving unity of purpose with Allies, Partners, and Industry and strengthening legal legitimacy of subsequent actions
 - Selecting response options perceived as consistent with the Law of Armed Conflict relies on the ability to attribute the initial hostile action
 - **Impact**: robust space domain awareness is required for credible response option decisions



Initial Findings (3 of 3)

- **Strategic Messaging**: The ability to shape perception of events is critical
 - The U.S. must pursue identification and communication of aggressive, unsafe, and hostile behaviors before adversary is able to shape the narrative
 - Building and shaping international alliances can weaken China's expanding influence and global access
 - **Impact**: perception of legitimacy (with allies and non-aligned nations) for response options is strengthened with rapid, accurate, and factual strategic messaging
- **Military Response Options**: Possessing a suite of military response options is necessary to address the increasing range of threats
 - Options must be pursued for all domains and carefully synchronized by US Space Command across required combatant commands
 - Ability and capacity to "respond in kind" seen as an essential to control escalation
 - Defenses and resilience measures (e.g. rad hardening some LEO satellites) also seen as useful to control escalation
 - The ability to reconstitute more rapidly than the adversary was necessary for victory in prolonged conflict
 - **Impact**: credible military response options are necessary to deny first-mover advantages



Recommendations (1 of 3)

- **Improve Clarity to prevent unintended escalation or cede advantage to adversaries:** Clear definitions remove ambiguity and speed decision making
 - Develop enduring standards and norms—even if only U.S./allies agree
 - Encourage workshops and wargames examining conflict in space during PME and with universities to continue to evolve thinking and understanding
 - Space Force and Space Command should continue to leverage existing doctrine of other domains as a template, thus creating a common warfighting lexicon
- **Integrate Partners for enhanced capability and capacity:** Continue to expand inclusion of allies/partners to align perceptions and achieve unity of effort
 - Allies/partners add strategic weight and capability to all activities to counter adversary hostile actions in space
 - Develop agreed to roles and responsibilities for commercial, allies, and military
 - Integrate commercial and allied capabilities into operational plans and expand capacity through foreign military sales



Recommendations (2 of 3)

- **Conduct Strategic Messaging to shape perceptions throughout spectrum of conflict**: Raise understanding of value of space activities, consequences of hostile actions, and necessity of response options
 - Reinforce position through consistent messaging on acceptable space behavior
 - Reduce classification barriers to enable broader communication
- **Continue to increase Mission Resilience to withstand hostile acts**: Increase redundancies and alternatives to space support to Joint Operations
 - Capabilities provided by space operations must persist through gray zone and conflict
 - Alternative, redundant, and resilient PNT, remote sensing, communications, and missile warning give a lethal edge to joint and coalition operations
- **Enhance Infrastructure Protection underpinning space operations**: Tenaciously defend critical infrastructure supporting space operations
 - Data networks enabling command and control of satellites
 - Power grids supplying energy to space operations locations and bases
 - Force Protection/Counter-UAS/Missile Defense/Golden Dome defenses to maintain launch facilities, operations floors, and operational C2 centers



Recommendations (3 of 3)

- **Increase Capability and Capacity to conduct military response options:** Achieving, preserving, and restoring space superiority requires breadth and depth of capabilities
 - Leverage servicing, in-space logistics, defensive systems, counterspace weapons, and remediation of hazards such as debris or NUDET radiation
 - Preposition surge assets and establish plans to rapidly leverage commercial
 - Increase and diversify launch capabilities to rapidly field architectures and reconstitute following space combat attrition
 - Increased and stabilized investment to ensure industrial base capable of outpacing adversary preparation of battlespace and reconstitution of capability
- **Continue to expand Training and Exercises to hone response and space superiority measures:** Refine skills and deepen understand for military members and those involved in space operations
 - Space Forces must hone decision making cycle and response options for adversary hostile actions through exercises and wargames
 - Sister services must understand their role in gaining/maintain space superiority and exercise supporting operations
 - Train/exercise for both escalation within gray zone and conflict



Recommendations As a Virtuous Cycle





Conclusion

- Conflict in space is a complex and not well understood topic
- The United States is currently in Gray-zone activities with China
- Space conflict cannot be understood through isolated incidents, but must be viewed as part of a broader, dynamic, strategic environment
- The United States should continue to refine/define its decision framework for responding to hostile actions
- Additional capability and capacity of military response options is needed to address the growing scope of threat vectors
- Strategically communicating norms and positions is necessary to shape conditions on terms favorable to the United States
- Iterative improvements with Allies and Partners to frameworks, capabilities, and operations is essential to assuring space superiority

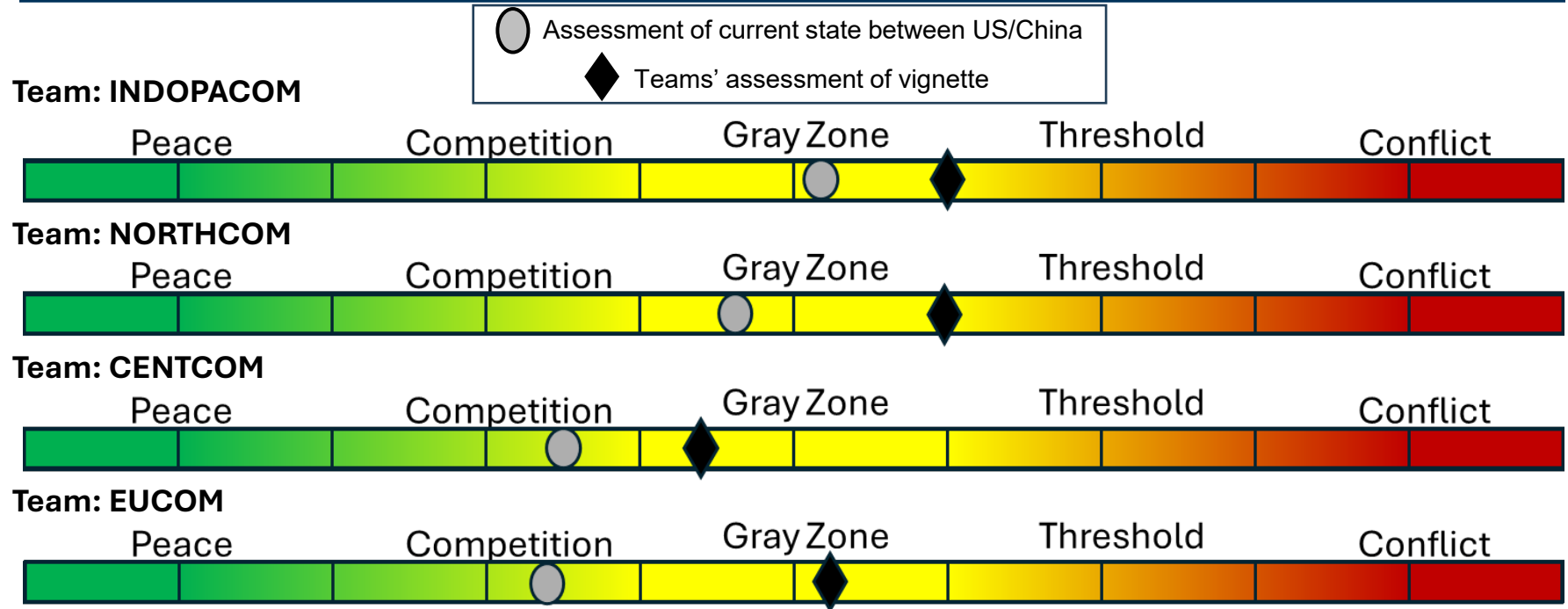
The best deterrence is found in credible military capability



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Baseline and Vignette 1 (Show of force)

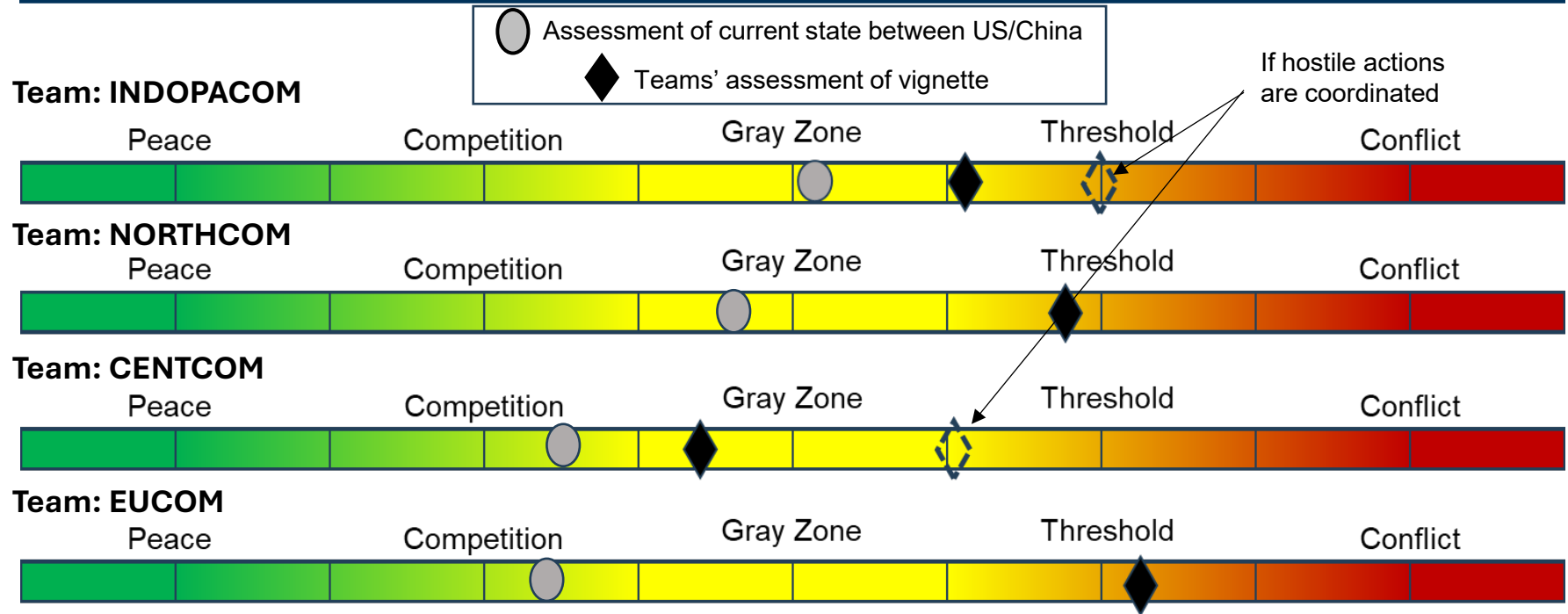


Assessment:

- Considerable variation on perception of current state of competition with China
- All believed the show of force and uncertainty surrounding the commercial satellite's untimely death raised us on the spectrum of conflict
- Participants identified a clear distinction between loss of commercial, military, national, or NC3 systems
- Attribution and ability to publicly identify hostile acts and intents is critical



Vignette 2 (Non-Kinetic)

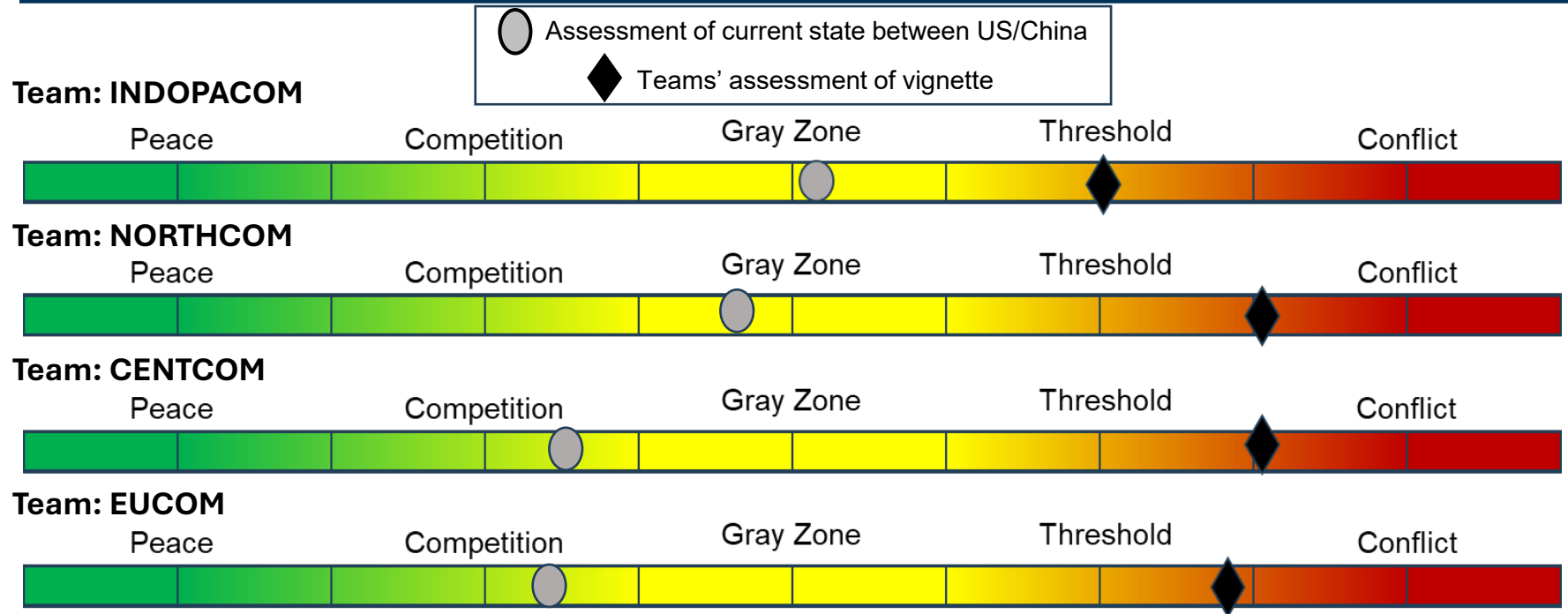


Assessment:

- Participants perceived significant escalation when adversaries collaborated
- Russian aggression seen as more provocative than other nations (on par with unattributed attacks on United States)
- Understanding scope of effects and adversary goals is essential to choosing most appropriate COAs



Vignette 3 (Loss of life)

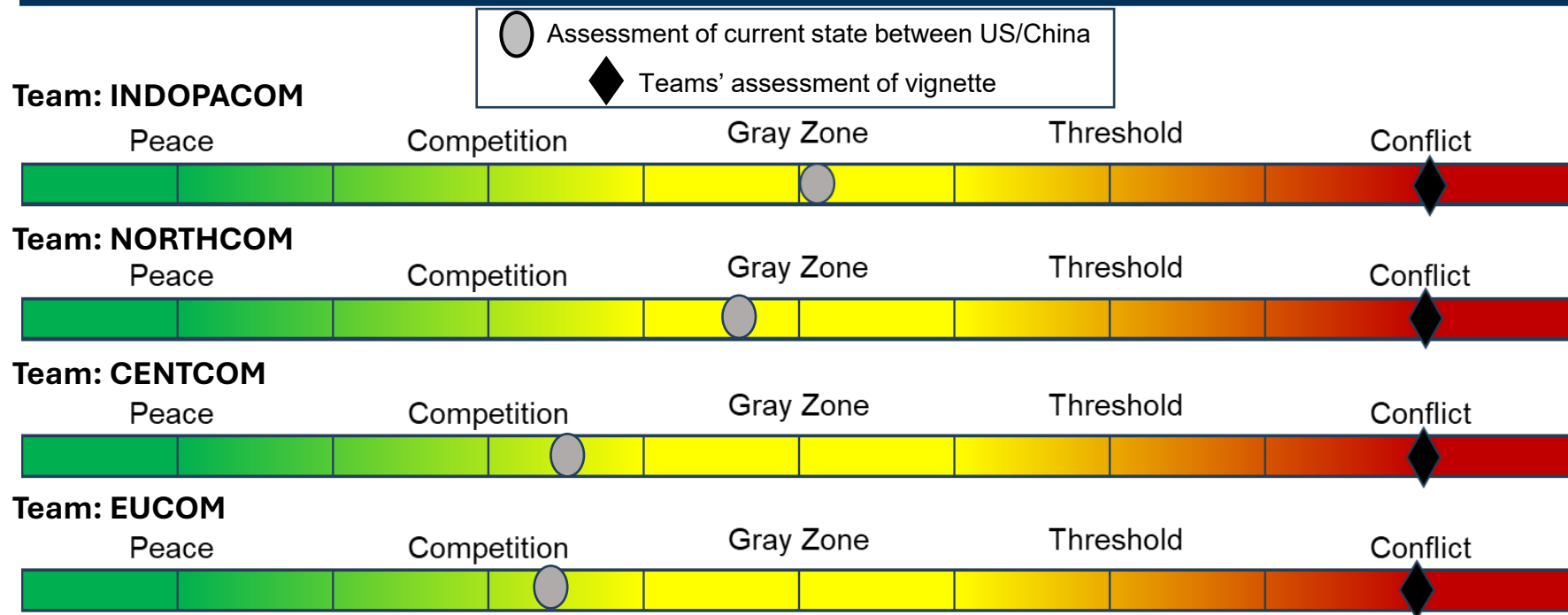


Assessment:

- Loss of human life escalates to the brink of conflict, but not seen as an “act of war” or an act requiring a reciprocal military response—not a tripwire event
- Verifying intent of hostile action is vital to ensuring appropriate response
- A collateral loss of life, even at scale or in space, was less provocative than an intentional attack



Vignette 4 (Significant terrestrial operation)

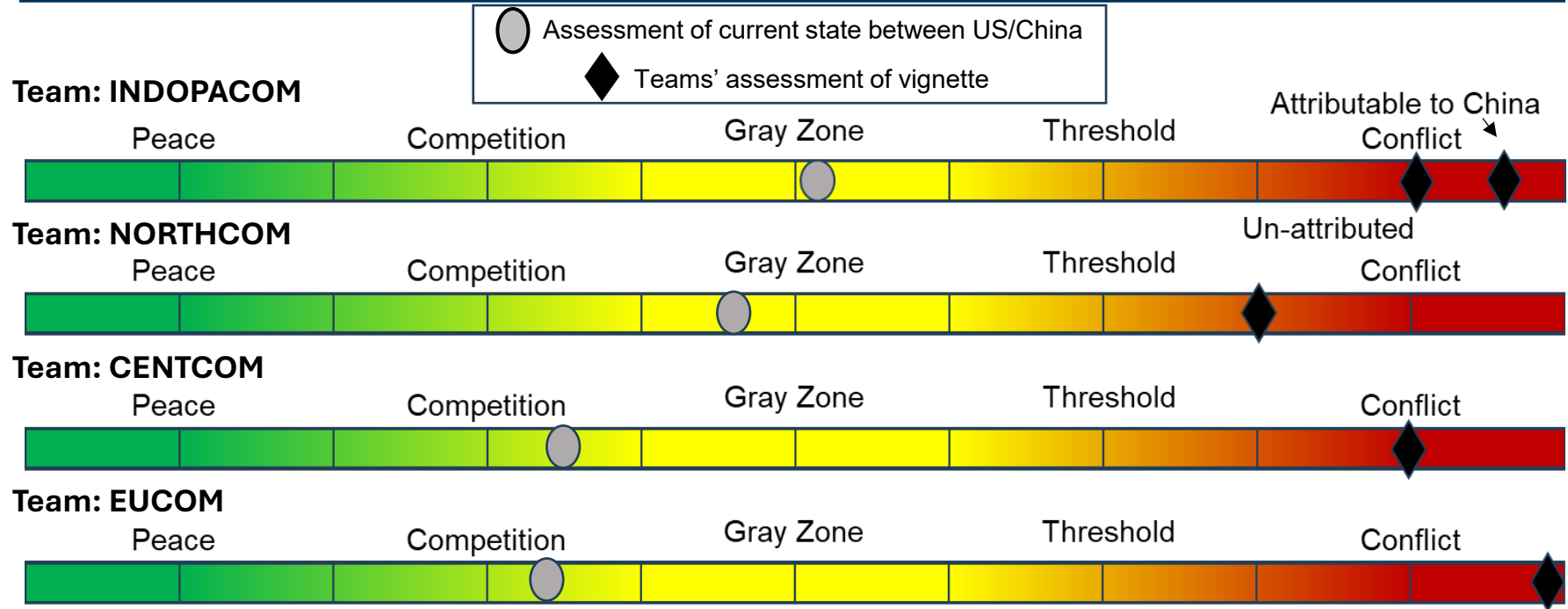


Assessment:

- Violating NATO Article 5, invading Taiwan, kinetic strikes in the United States, and ground operations against U.S. forces all clear red-lines for conflict
- Simultaneous global engagements require additional levels of coordination to ensure unity of purpose and stewardship of limited resources
- Repositioning and reconstitution of space systems is essential to enabling victory over protracted conflict



Vignette 5 (Nuclear detonation in LEO)



Assessment:

- If attributed to a specific nation, use of a nuclear weapon in space further escalates conflict, but seen as less escalatory than kinetic attacks against the U.S.
- An adversary's use of a nuclear weapon could be a means to fracture an axis of hostile nations



Conflict in Space Workshop

- **Who:** Subject matter experts from government, industry, academia, and international partners
- **What:** 2-day workshop leading to a written report
- **When:** 13-14 January 2026
- **Where:** Air and Space Forces Association National Operations Center in Pentagon Row
- **Why:** Examine the elements foundational to achieving a space superiority in conflict
- **How:** Guided discussion and scenario response