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## Annex 2 States Ever Ratify the CTBT? Tracing Policies, Analyzing Obstacles, and Projecting the Future of Nuclear Test-Ban Diplomacy

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) remains a cornerstone of global nonproliferation efforts, yet its entry into force is stalled by the non-ratification of eight Annex 2 states. This paper explores the evolving policies of these states—specifically the United States, China, Egypt, Iran, Israel, India, Pakistan, and North Korea—to identify key political, strategic, and regional obstacles to ratification. It assesses how emerging trends, such as renewed arms races, great power competition, and verification challenges, influence their decision-making. Special attention is given to how technological advances, including AI and satellite monitoring, can strengthen verification systems and build confidence in compliance. The analysis also addresses cyber threats to the International Monitoring System (IMS) and proposes enhancing cybersecurity as a crucial confidence-building measure. The paper argues that achieving CTBT ratification requires tailored strategies for each Annex 2 state, recognizing their unique security concerns and geopolitical interests. By examining historical trends and current dynamics, this paper projects future scenarios for CTBT diplomacy and provides actionable recommendations for breaking the diplomatic deadlock.

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