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Technical Presentation
“TCTB: Facilitating Cooperative Remediation of Massive
Derelicts”



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Orbital Debris - Our Shared Problem

- Humanity's future in space is threatened by man-made debris in outer space
- Three sizes
 - Small: Hundreds of millions of objects
 - Medium: Millions of objects
 - Large: 36,000+ objects larger than a grapefruit
- Most dangerous: “**Massive Derelicts**” in Upper-LEO
 - 2000+ objects, 1-10 tons per object, un-maneuverable
 - Owned mostly by the Russian Federation, the United States of America, and China
 - France, Japan, India and the European Space Agency own a few
 - Objects are tightly clustered in orbital shells and travel at high speeds
 - Forecast collisions (or explosions) are imminent and will be devastating

The Case for International Cooperation

- Purely national programs, although beneficial and necessary, carry baggage that will inhibit timely, efficient and meaningful risk reduction
 - Domestic preferences
 - National security constraints
 - Ineffective to reduce overall statistical risk
- Opportunity versus fault
- Share the burden (enables economic efficiency)

Necessary Building Blocks for Cooperation

- A path to cooperative remediation of **Massive Derelicts** must include:
 - Agreement on a framework for cooperation
 - Principles of Cooperation
 - Planning Process and Timeline
 - Performing the Work – remediation mission business model

Cooperative Structure

- Alternative Frameworks
 - UN-based arrangement (multilateral)
 - Government to government agreements (bilateral)
 - Public - Intergovernmental organization (IGO)
 - Private-Public - Nongovernmental organization (NGO)
- Private-Public International NGO (INGO): The surest path to timely cooperative remediation
 - Non-political (neutral)
 - Low cost, streamlined, transparent
 - Enables economies of scale (efficient)
 - No changes to international law required

Necessary Principles of Cooperation

- Cost, risk and information sharing during planning and remediation missions
- Legal consent
- Object selection methodology
- Procurement plan
- Dispute resolution mechanisms
- Protection of sovereign prerogatives

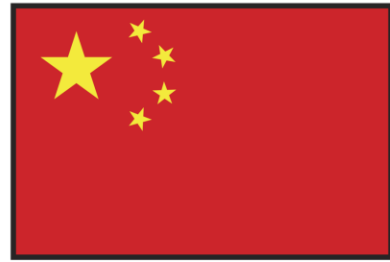
Necessary Planning Process and Timeline

- Phase 1 – Negotiation of structural agreements including Principles of Cooperation (one year or more)
- Phase 2 – Identifying and selecting initial objects for remediation consideration (one year or less)
- Phase 3 – Development of contracting process, documents seeking proposals for remediation, evaluation of proposals, negotiation and award of mission contracts (one year or more)
- Phase 4 – Performance of initial remediation mission (one year or more)
- Phase 5 – Follow-on missions sufficient to provide meaningful risk reduction (several years)

Performing the Work – Remediation Model

- TCTB's public-private INGO model facilitates cooperation among governments through its single-issue focus
- TCTB's neutral, multi-jurisdictional structure ensures confidentiality, transparency and trust
- TCTB's model enables efficiency
- TCTB's path is streamlined to meet the urgent need
- Examples of similar NGOs include the Red Cross (shared objective of humanitarian aid), and international mediation for cross-border disputes (shared respect for rule of law)
- More information about TCTB's novel path to remediation can be found at threecountrytrustedbroker.com

INGO Model – TCTB



China



Russia



USA



Firewall





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TCTB Advantages and Limitations

- **TCTB Is:**

- The lowest cost alternative
- Neutral and transparent
- Fully compliant with existing local and international law
- Overcomes all legal, political and economic hurdles
- Ready to begin planning now!

- **TCTB Is Not:**

- An obligation to remediate
- A substitute for diplomacy, or political decision-making
- A solution for all types of debris – TCTB's Proposal is limited to Massive Derelicts

Questions?

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