The Air National Guard

LVC Flight Plan

Always On Mission

Foreword

The Air National Guard is committed to ensuring ready ANG forces through affordable and effective Live, Virtual, and Constructive Operational Training (LVC-OT). Considering the rapidly changing and demanding twenty-first century security environment, fiscal constraints, and increased cybersecurity concern, LVC-OT is required for ANG Airmen to keep proficiency, sustain readiness, and innovate new and better ways of maximizing integrated combat power.

LVC-OT is essential to build skills required to support ANG's balanced priorities. As a proven choice for the warfight, ANG units execute LVC-OT for routine federal mission training at home or abroad, in any geography, and in diverse environments with various intensities of conflict.

Similarly, LVC-OT can bolster ANG's strength as a first choice for Homeland Operations, allowing tailored and affordable exercise of state missions and domestic operations. LVC-OT provides potential for regular, inexpensive exercise of coordinated roles supporting civil authorities or integrating with interagency groups.

Building global partnerships remains a National Security Strategy priority. Establishing LVC-OT capabilities with partner nations enables efficient and frequent integrated training opportunities that complement existing partner-building activities with minimal cost.

This ANG LVC Flight Plan provides a vector for the development of the ANG LVC-OT Roadmap, which will detail action steps to achieve the ANG LVC Vision. This plan will be reviewed and updated along the same schedule as the ANG Strategic Master Plan, and will ensure ANG LVC-OT capabilities are synchronized with active component counterparts.

ANG Airman readiness is a top priority. LVC-OT capabilities allow ANG warfighters to be ready for wartime tasks at a moment's notice, to be ready to execute coordinated roles in domestic operations, and to integrate effectively with global partners. As a ready, integrated force, we will remain Always On Mission.

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Executive Summary

The Air National Guard's LVC Flight Plan supports the USAF and ANG Strategic Master Plans and ensures maximum dual-role readiness for ANG Airmen as an integrated part of the joint Total Force. This document shapes the way forward and clarifies the desired end state for ANG Live, Virtual, and Constructive-Operational Training (LVC-OT) capability. This document guides staffs and supporting agencies in creating and managing LVC-related plans and budgets. The Flight Plan will be followed closely by the ANG LVC-OT Roadmap, which will contain specific detail regarding foundational resource needs. Together, these documents will synchronize ANG LVC efforts to ensure a clear and common goal which will maximize efficiency, synergy, and readiness training value.

The ANG vision for using LVC capabilities, referred to as the "**ANG LVC Vision**," is to:

Maximize ANG readiness to conduct current and projected federal and state missions through efficient, frequent, integrated training in networked live and virtual systems.

Regarding federal mission readiness, to achieve a total force solution, the ANG will continue to capitalize on foundational LVC capabilities provided by the active component to train and equip units. ANG staff will routinely synchronize with MAJCOM counterparts to ensure ANG unit integration in relevant roadmaps. ANG resources are used to bolster capabilities to meet unique or unmet dual-role training needs, and to support ANG global partnership-building priorities.

There are eight Lines of Effort (LOEs) to be synchronized in the execution of this Flight Plan:

1. **Airspace and Ranges**
2. **Live Aircraft Capability**
3. **Simulators and Trainers**
4. **Networks and IT Infrastructure**
5. **Distributed Training Center Functions**
6. **Modeling and Simulation (M&S) Expertise and Workforce Development**
7. **Cybersecurity and Multiple Independent Levels of Security (MILS)**
8. **LVC-OT Capability and DMO Oversight**

Synchronization of theses LOEs will enable ready ANG warfighters to employ globally across the spectrum of conflict and operations as part of integrated joint forces. LVC-OT provides affordable and repeatable exercise of integrated capabilities to maximize airmen proficiency in war fighting, executing Domestic Operations (DOMOPS), and building global partners' capabilities and capacity.

Table of Contents

ANG LVC Vision

The ANG LVC Vision is to

Maximize ANG readiness to conduct current and projected federal and state missions through efficient, frequent, integrated training in networked live and virtual systems.

The ANG LVC Vision statement concisely conveys ANG leadership intent. Annex A details the thought process for each word and concept in this statement.

The ANG LVC Flight Plan complements related active and reserve component LVC visions, plans, and roadmaps. Ideally, active component MAJCOMs provide an integrated federal-mission LVC-OT capability to gained ANG units. If gaps emerge, ANG leadership will engage with active component counterparts to pursue total force LVC-OT capability. ANG efforts to implement this LVC Flight Plan are intended to seamlessly integrate with active component efforts. ANG resources will be used to fill LVC-OT capability gaps, fulfill unique ANG requirements, and to facilitate regular ANG warfighter participation in integrated Distributed Mission Operations (DMO) in live or virtual platforms.

Efforts to achieve the ANG LVC Vision will ensure ANG units have access to LVC capabilities, allowing for robust DMO in unit training plans for all types of daily training to ensure full-spectrum readiness for integrated operations. Units will use DMO to facilitate blended training in live and virtual systems, execute virtual training with full platform capabilities, and regularly connect with "employment partners" for integrated DMO events.

"For the future Air Force to operate as described in this concept, today's Air Force must pursue: Frequent training, exercises, and technology development using live, virtual, and constructive (LVC) venues to enable the conservation of resources, improve the realism of training for combat and multi-domain challenges, and facilitate the development of innovative and collaborative solutions."
Air Force Future Operating Concept, Sept 2015

LVC & DMO

"LVC" refers to the nature of platforms or entities within a networked training environment. "LVC-OT" and "DMO" are synonymous and refer to the activity of networking any combination of Live, Virtual, or Constructive entities for operational training, tactics development, or test. LVC-OT provides expanded and enhanced daily training opportunity, allowing blended Live-Virtual (LV), Live-Constructive (LC), Virtual-Constructive (VC), or LVC interactions as parts of unit training plans.

ANG-Specific Training Applications

LVC capabilities will be established for ANG Airmen to train for federal and state missions regularly, and to strengthen global partnerships. Regular training with a robust LVC-OT infrastructure is the most affordable and effective way to maximize readiness and integrated effectiveness in these balanced National Guard priorities.

Federal Missions

ANG units participate in nearly every USAF mission set. ANG staff will work with MAJCOM staffs to ensure LVC capabilities are planned, established, and sustained for ANG units to ensure similar integrated training opportunities as active component counterparts.

Networked simulator training is already a regular activity that maintains readiness in Designed Operational Capability (DOC)-statement missions for many communities. ANG Airmen will continue to regularly participate with the joint total force in all LVC-OT Lines of Effort.

Employment effectiveness in integrated combat operations relies increasingly on frequent flow of multisource intelligence, and therefore requires inclusion of Global Integrated ISR (GIISR) capabilities in LVC-OT. ANG ISR communities will have access to LVC-OT to meet integrated intelligence training needs.

"…the ANG is fully engaged in all five core missions of the Air Force."
ANG Strategic Master Plan, Nov 2014

The ANG serves a major role in the federal mission of Homeland Defense (HLD). Units involved in this activity will have the ability to train regularly using LVC-OT in realistic HLD DMO scenarios.

LVC capabilities will expand as the ANG gains new missions and capabilities. For example, as Cyber and Space training needs and systems become defined and available, incremental and synchronized efforts to build integrated LVC-OT capability will continue.

State Missions

For platforms involved in regular domestic operations (DOMOPS) activities, efforts will be made in applicable LOEs to gain relevant LVC-OT capabilities. Missions such as firefighting and search and rescue are examples of missions for which LVC-OT can increase integrated effectiveness. Also, LVC-OT will be used to exercise ISR activities such as counterdrug, border patrol, and Cyber ISR.

Similarly, ANG LVC-OT capability will support integrated training to exercise Civil Support in disaster response, civil unrest, and other relevant scenarios for applicable airmen in C2, ISR, Mobility, and other roles.

Domestic Partnerships

Current and future ANG employment as part of the joint total force nearly guarantees that ANG warfighters will employ collectively with joint forces in federal missions at home and abroad. Therefore, efforts to coordinate across the DoD to include joint partners in LVC-OT will be prioritized.

For HLD and Defense Support of Civil Authorities (DSCA), joint and interagency coordination is expected. Therefore, LVC-OT capabilities will be pursued to allow networked training with relevant agencies as systems and policy allow interactions within such scenarios.

Global Partnerships

"The Air Force will leverage advanced telecommunications and integrated LVC venues to allow Airmen of all disciplines to collaborate with each other and our joint, interagency, and international partners."
USAF Strategic Master Plan May 2015

Global partner capability to effectively integrate into coalition operations—or lead worldwide coalition operations—depends upon continued integrated training opportunities with US forces. Therefore, the National Guard has committed to Building Partner Capacity (BPC). An efficient and effective addition to existing BPC efforts is the establishment of a persistent LVC-OT network and support for regular tactical and operational-level DMO—primarily Virtual-Constructive—with nations who have purchased or established compatible simulation capabilities.

By establishing an appropriately secure network with allied nations, global partners will have daily access to integrated combat operations training in the virtual environment. Coalition warfighters regularly participating in daily DMO will rapidly gain proficiency in integrated employment using English-language tactical communications. Frequent LVC-OT will maximize integrated coalition partner capacity while minimizing costs, exercise movements, and OPTEMPO.

Some partner nations are building DMO programs and capabilities. As policy and infrastructure allow, ANG units will have access to coalition training opportunities hosted by partner nations.

Live Training

"<LVC-OT> is a fundamental capability that should be at the heart of Air Force training programs supporting operational readiness."
USAF LVC-OT Flight Plan, March 2013

ANG unit readiness requires capabilities to conduct regular, daily training in live or virtual systems. Units will be able to execute planned training in live systems with networked man-in-the-loop constructive forces. Whether generated and controlled at a participating unit, airspace or range-associated facility, or a networked Distributed Training Center (DTC), these forces will enable tailored training. Units will have the ability to train daily with basic to robust constructive red forces to supplement live ones, and will also have access to virtual or manned-constructive neutral or friendly forces for realistic training that is scalable in scope to meet

objectives. Constructive friendly force platforms will have all relevant integrated blue force capabilities to provide realistic information and integrated effects in training.

In addition to daily training, units will have opportunity to coordinate or participate in occasional live special events, such as weekly Large Force Employment (LFE) activities or special mission exercises. Planners for these missions will have access to manned-constructive or virtual assets to supplement friendly joint forces, and constructive neutral or hostile forces to meet training objectives.

ANG units continue to participate in USAF and DoD exercises, which will increasingly include LVC-OT capabilities to ensure a robust threat presentation and to complete desired force packaging with man-in-the-loop constructive forces. ANG live assets will be configured to maximize the training value of LVC-OT in various exercises, and ANG-coordinated exercises will include LVC capabilities when needed to maximize readiness training value.

"Assembling a distributed LVC environment should be akin to scheduling resources on a range – seamless, integrated, scalable, supportable, and tailored to specific M&S user requirements."
USAF M&S Vision, July 2010

Virtual Training

Maximized readiness also requires daily or frequent virtual training. Virtual trainers (simulators) for each community will be **available**, **concurrent**, of **adequate fidelity, networked**, **interoperable** within the LVC-OT environment, **secure**, and supported by **skilled personnel**.

Available – Many ANG warfighter communities will have simulators at each unit. Some will have them at Mission Training Centers (MTCs) and will travel for periodic virtual training. Regardless of proximity, simulator availability will be ensured to meet training requirements.

Concurrent – Simulator cockpits, displays, and capabilities must match (be concurrent with) live platform capabilities. This includes all aspects of full combat capability, allowing warfighters to train as they fight with all systems operating, all weapons available, and realistic effects in training.

Adequate Fidelity – Simulators must have adequate fidelity to meet training objectives in all DOC-statement missions and to exercise applicable DOMOPS roles and activities. Fidelity must be adequate in all characteristics required for integrated mission execution, such as visual display fidelity, information fidelity, aero-model fidelity, and others as prioritized by units and staffs.

Networked – Simulators will be connected to appropriate DMO networks for adequate interconnectivity with relevant total force warfighters and agencies to execute integrated training. Interconnections to various DoD networks will be provided for maximum training opportunity, including connection with USAF DTCs and relevant joint, coalition, and interagency capabilities.

Interoperable – Simulators will be compliant with applicable industry, DoD, and USAF DMO standards to ensure maximum interoperability. In addition to technical standards compliance, trainers will be operationally interoperable to the level of fidelity needed to enable specific, frequent training interactions in all tasked and future mission sets.

Secure – Simulators and simulation systems must meet all cybersecurity standards and criteria to allow persistent connections to secure LVC-OT networks. Trainer development and support contracts will ensure cybersecurity requirements will be sustained.

Skilled Support Personnel – Every location with one or more networked simulators shall have available technical and/or operational support to ensure effective simulator setup, scenario execution, and debrief system manipulation.

All of these characteristics are essential for regular, viable integrated virtual training and maximized ANG Airman readiness.

Units with local virtual trainers will have access to networked training with flexible schedules and tailorable training objectives. Units without local simulators will travel to simulator training centers at rates determined by lead MAJCOM and ANG staffs to accomplish virtual training, and will have access to networked training support from those training center locations.

Commanders will ensure virtual training and DMO are integrated parts of regular training activity, and staffs will ensure readiness training credit is allowed for applicable virtual sorties and events. ANG units will be able to participate in Virtual Flag, Emerald Warrior, Fleet Synthetic Training, and other LVC-OT exercises. Units will also be able to define and plan custom LVC exercises regularly to meet proficiency training needs.

"Free from the constraints of the physical realm, we can develop virtual environments – airspace, ranges, etc. – that deliver robust, realistic training against existing threats as well as those we anticipate in the future."

America's Air Force, A Call to the Future, July 2014

Constructive Forces

Whether live or virtual systems are used for training, computer-generated forces (CGFs) will be available for integrated employment that can be tailored to meet specific training objectives.

Simulators will be delivered with Environment Generators (EGs) and threat systems to allow realistic constructive entity representation during stand-alone simulator training. These constructive forces must be easily created and manipulated for real-time control by unit members. The selection of available forces will allow for representation of relevant threats in global areas of current conflict, areas of emphasis in national strategy documents, and areas the warfighter community prioritizes for OPLAN rehearsal or local training. CGFs will allow accurate representation and control of neutral and friendly forces expected in these theaters, including control of sensors, weapons, emissions, and effects relevant to platform integrated employment.

Efforts to have available constructive representation of emerging multi-domain forces, effects, and threats that will be relevant in future operations and scenarios will be started as soon as data is available. LVC-OT opportunities can then be presented before potential real-world employment with these entities, effects, or threats.

> **"Threats and opportunities will continue to evolve from their present state as the world progresses… Twenty years from now, when Airmen look to conduct operations, they will do so with truly integrated air, space, and cyberspace actions—and with a clear understanding of how these actions integrate into joint and combined operations."**
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> **Air Force Future Operating Concept, Sept 2015**

Simulators will be configured to ensure accurate constructive representation of threats to exercise all DOC-statement missions and combat capabilities, stimulate all ownship (on-board) sensors, and allow accurate communications and datalink interactions.

In addition to stand-alone training, constructive forces will be used in routine DMO which may include warfighters training in LC, VC, or LVC constructs. When accomplishing DMO, constructive forces will be presented IAW all technical standards to ensure accurate representation regardless of EG. Unit members, simulator instructors, MTC instructor cadre, or DMO event controllers at capable DTCs or other agencies are possible options for constructive forces control.

The ANG will maintain a DTC to provide manned-constructive forces for daily tailored DMO. This DTC will implement the technology required to generate entities and environments to stimulate live and virtual systems to meet training objectives.

ANG warfighters will have access to LVC-OT events coordinated by DoD DTCs using reliable, secure, and persistent networks. Constructive forces presented through these DoD network connections will be standardized to the maximum possible extent to allow regular participation in collective training.

Future contracts to provide technical and operational support at ANG unit and regional simulator locations will be written to include support of networked training, including networked training in which local simulators may or may not be the primary training asset.

Essential Lines of Effort (LOEs) to Achieve the ANG LVC Vision

To achieve the ANG LVC Vision, various LOEs must be synchronized within the ANG and across the USAF and DoD. These LOEs are:

Airspace and Ranges –Access to training ranges and airspace with LVC infrastructure is essential for airmen in live or virtual systems to maximize training. Infrastructure must include connectivity to DMO networks and DTC functions so that airmen in live and virtual systems have opportunity for daily LVC-OT with combinations of Live, Virtual, and Constructive entities. In addition, realistic and diverse range target arrays are required for effective integrated training.

Live Aircraft Capability – Live aircraft and weapons systems require capability to display and interact with Virtual-Constructive (VC) entities realistically as if they were live entities, and VC participants must fully stimulate live player systems. Similarly, live aircraft and systems must be represented in virtual environments, including their effects. Live aircraft and weapon system architectures must have security controls in place to allow full interaction with virtual and constructive participants during DMO.

"LVC will allow the CAF to implement "on demand" training across the ROMO in scalable threat environments that are tailored to the objective. Just as important, LVC enables the "adaptive training" strategy inherent in performance-based training."
CAF LVC Vision, July 2014

Simulators and Trainers - Each ANG warfighter community requires access to simulators or trainers for virtual training that are concurrent with live systems, of adequate fidelity, supported by qualified instructors and technicians, and compliant with applicable technical, operational, and security standards for networked training. ANG units will have the same or better federal mission training capability as active component counterparts, allowing training in all DOC-statement tasked missions in high-interest Areas of Responsibility (AORs), as well as local airspace. Devices will ensure training at full combat capability, allowing for all systems, capabilities, sensors, and integrated effects to be exercised during DMO. In communities with regular operational DOMOPS roles, trainers will have capabilities required for integrated training in those primary functions.

Networks and IT Infrastructure – ANG MTCs, unit simulators, ranges, and the DTC requires connection to secure DMO networks to facilitate relevant LVC-OT with USAF, joint, coalition, and interagency partners. Through such networks, LVC-OT activities will be available for LC, VC, and LVC with networked exercise support available for participation in daily DMO and scalable exercises. Required infrastructure includes LVC-integrated communications and datalink capabilities, as well as support for tethered or untethered LVC solutions as technology and standards develop and are implemented.

ANG warfighters will have the ability to train at full combat capability during both stand-alone and networked training. Therefore, network architectures will include required security controls and Cross Domain Solutions (CDS) to allow MILS, thereby facilitating maximum interoperability.

Distributed Training Center – Regular ANG LVC-OT requires an agency with operational and technical expertise for planning and coordination of DMO, technology integration, and synchronization with other USAF and DoD DTCs and agencies. The ANG will maintain a DTC to provide DMO capabilities for ANG units and other persistently-connected warfighters, indirectly-connected units, and various USAF and DoD DTCs and LVC-relevant training agencies.

ANG DMO will allow for various constructs of frequent, tailorable proficiency training using white-force expertise to allow integrated employment in live and virtual training. These constructs will meet the flexible scheduling and customization needs of the part-time ANG warfighter. Offered DMO support will include a spectrum of tailored DMO options including single and multi-site events, large force and mission rehearsal events, collaborative events with other USAF and DoD DTCs, and events tailored to address unique interoperability limitations or security requirements.

The ANG DTC will construct its operations to maximize ANG warfighter training opportunities as seamlessly integrated with the total force. Additionally, the ANG DTC will seek efficiency and synergy with other USAF and DoD DTCs as part of a coordinated team of LVC-OT stakeholder agencies with complementary capabilities. ANG units will have networked access to DMO events hosted by other USAF and DoD DTCs, and units across the joint total force will be encouraged to participate in ANG LVC-OT in which integrated training effectiveness can be maximized.

M&S Expertise and Workforce Development - M&S expertise to support LVC-OT capability implementation is essential to ensure synchronization with USAF and DoD LVC-OT activities. A developed workforce with M&S expertise, LVC-OT technology integration experience and DMO operations continuity must be maintained. ANG DTC workforce, ANG staff members, and other LVC-relevant agency or unit members will be involved in USAF M&S working groups and LVC-OT forums, as well as deliberate USAF LVC-OT workforce development efforts.

"Indeed, an educated M&S workforce can significantly enhance our ability to fly, fight, and win while at the same time saving valuable resources."
USAF M&S Vision, July 2010

Cybersecurity, MILS - All LVC capabilities must ensure protection of critical information. Agile acquisition methods will ensure all LVC-related contracts specifically state cybersecurity policy and accreditation requirements for systems and networks. Full combat capability DMO requires assurance of all aspects of security, including facility, personnel, contract, and other areas of relevant security concern. Additionally, CDS will be established for regular MILS interactions to allow prioritized connectivity for integrated training with various combinations of platforms.

LVC-OT Capabilities and DMO Oversight - HQ USAF (HAF) has established a governance structure in the LVC-OT Flight Plan (Apr 2013). ANG will participate in LVC-OT governance processes, and will provide coordination and guidance to groups planning and executing each of the LOEs. ANG staff working in the LVC enterprise will ensure continuity to best capitalize upon experience for effective LVC-OT decision making.

"The LVC-OT program and flight plan crosses MAJCOM, Service, and coalition lines. Its success rests upon the incorporation of Air Force-level vision, policy, and guidance, and MAJCOM capabilities. <It> includes representatives from Headquarters Air Force (HAF), MAJCOMs, and other key stakeholder organizations."
LVC-OT Flight Plan, Mar 2013

Conclusion

Maximized ANG warfighter readiness requires effective establishment of synchronized LVC-OT capabilities for regular DMO training in live and virtual systems with robust constructive environments. LVC-OT will ensure the most-ready and proficient ANG combat force, while minimizing cost, risk, and OPTEMPO. Additionally, the ANG warfighter training experience will be more integrated than ever before with the rest of the Air Force, as well as joint and interagency partners in both federal and state mission roles. Finally, ANG efforts to build global partner capacity through regular Distributed Mission Operations, will transform partner nation warfighter proficiency as part of integrated combat forces.

The commitment to realizing the ANG LVC Vision by synchronizing efforts and investing in critical LVC capabilities is a commitment to the ANG Airman, who will be more integrated than ever before and more effective as an essential part of the joint total force.

"In coming years, our Nation's ability to gain and maintain superiority in all operating domains—air, land, sea, space, and cyberspace—will become progressively more difficult as sophisticated technologies continue to proliferate… Another key to maintaining air and space superiority is ready, trained Airmen who are properly equipped for their mission." **Global Vision, Global Reach, Global Power, Aug 2013**

Annex A. Vision Statement Description

This annex documents the details regarding the purpose of the words and concepts in the ANG LVC Vision Statement. An integrated team of ANG and USAF members collaborated to articulate the ANG LVC Vision:

Maximize ANG readiness to conduct current and projected federal and state missions through efficient, frequent, integrated training in networked live and virtual systems.

"**Maximize ANG Readiness**" – LVC Capabilities are developed to ensure ANG forces are as ready – skilled, proficient, effective as part of the integrated force – as possible, with each LVC-OT event yielding maximum readiness value per dollar, minute, and unit of warfighter effort.

"**current and projected**" – Tactics and platform capabilities evolve, therefore specifics of future mission priorities and integrated force capabilities cannot be fully known. Established infrastructure and system acquisition processes must ensure standards compliance and capacity for projected mission requirements worldwide on timelines that allow timely training capability relative to needed proficiency timeframes.

"**federal missions**" - Training for DOC-statement missions and expected federal mission tasking for defense of national interests at home and abroad is essential, and should be fully integrated with all active and reserve-component employment-partner communities. Federal mission training needs can be identified through means such as the Defense Readiness Reporting Systems (DRRS).

"**state missions**" - Many ANG units spend much of their time in DOMOPS activities such as wildfire control, mountain rescue, flood response, etc., and should have capability to train for such integrated employment. This drives a requirement for live and virtual system characteristics, constructive systems and networks to allow previously unavailable regular training opportunities for these missions.

"**efficient training**" – LVC capabilities allow DMO affordably, and when USAF and DoD LVC plans are synchronized, they allow for significant training value at relatively low cost. Synchronization of DoD efforts will also ensure efficiency as sharing of government-owned technology, data, and experiences increases.

"**frequent training**" – As warfighter proficiency is built upon regular training activity, LVC-OT capabilities will be established for use on a frequent basis, including daily use. For the ANG, this frequent training must be flexible in schedule and tailorable in content to meet the needs of the drill status guardsman.

"**integrated training**" - The most important concept of the ANG LVC Vision... the complexity and scale of operations required in the constantly evolving employment environment drives the need for fully integrated training. ANG training should replicate as much as possible the expected employment environment. Regular integration with common employment-partner warfighters and systems is essential, as is recurrent integrated operations and intelligence activities with joint and interagency partners across all domains of air, land, sea, space, and cyberspace. Realistic training for Domestic Operations, homeland defense, DSCA, and EM is also essential. DMO is an exceptionally affordable and effective way to maximize ANG training opportunities with all employment partners.

"**training**" – LVC capabilities provide enhancements or essential conditions for effective training in a wide array of training activities. These activities range from Initial Qualification Training (IQT) to Mission Qualification Training (MQT) to instructor upgrades, small to large force tactical and operational events, with options for daily, small-scale, tailored DMO training, weekly missions with many virtual participants, occasional large-scale exercises, and added manned-constructive forces in live-fly scenarios. LVC-OT can be tailored to specific requirements to "fill squares" and drive clearly defined task rehearsal, as well as provide dynamic training to bolster airmen proficiency.

"**networked**" - ANG warfighters can expect to employ in an integrated capacity; therefore, they must be able to train that way in both live and virtual systems. Networks will connect all capable simulators to DMO training capability and interconnect various DoD networks to facilitate integrated training. Similarly, networks to LVC-OT capabilities at specific range and airspace complexes will be established as capabilities are implemented.

"**live systems**" – ANG Airmen must have the ability to train in live aircraft/systems with airspace/range infrastructure to support robust scenarios with the ability to combine virtual and constructive assets in synch with range and live platform capabilities. Efforts related to "Live" in the "LVC vision" will relate airspace/ranges, OFP mods where applicable, access to radio networks from virtual/constructive systems, etc. There will also be efforts to assure live aircraft/system representation in virtual cockpits/systems. Live systems may be airborne (airplanes/space) or ground borne (Air Operations Center, Air Support Operations Center, etc).

"**virtual systems**" – Simulators or simulation systems are essential to maximize readiness. ANG Airmen must have access to concurrent, adequate-fidelity virtual systems (simulators or simulation systems) for robust training that enable low-cost, no-risk training to allow for IQT to WIC level training and integration with other assets on a regular basis. These systems must be networkable, compliant with applicable standards, and interoperable to fully function on the network, and must have skilled technical and operational support.

Annex B. ANG LVC-OT Roadmap Essentials

To achieve the ANG LVC Vision, ongoing key efforts will continue in accordance with this Flight Plan. Detailed Plans of Action and Milestones (POAMs) for each LOE will be created and published in the ANG LVC Roadmap, which will be created with a goal of approval and publishing in Spring 2016. This timeframe allows synchronization with USAF LVC Roadmaps that plan for program implementation in FY18-20. Pending completion of the ANG LVC-OT Roadmap, work will continue toward several priority activities that include:

1. **Instrument the Combat Readiness Training Centers for LVC-OT**. Though they may take new names and declare mission specialization, the centers at Alpena, Volk, Gulfport, and Savannah remain significant to communities across the total force for readiness training. Implementation of LVC-OT capabilities at these locations will be prioritized and synchronized with active component enterprise range plans.

2. **Prioritize simulator efforts** to resolve issues of availability, fidelity, concurrency, interoperability, security, or lack of skilled technical or operational support for existing simulators. Coordination with MAJCOM counterparts will continue to seek needed simulator capabilities, and ANG resources will continue to be used as required to fill current gaps or unique ANG requirements.

3. **Establish the Air National Guard's Distributed Training Center for long term viability**. A single DTC within the ANG will enable connectivity to LVC-OT networks, technical support, modeling and simulation integration and operations support to all ANG units with LVC-OT capability. The DTC will be the gateway of LVC-OT coordination and connectivity between ANG units and joint, interagency, and international partners.

4. **Dissolve barriers to network interconnections** with total force DMO capabilities. ANG Staff will continue ongoing work to ensure interconnectivity with active component and joint force warfighters with whom regular LVC-OT is essential. This involves synchronization with MAJCOM and service counterparts and development of parallel plans or roadmaps to meet requirements for interconnectivity and interoperability.

5. **Bolster international partnerships and build partner capabilities through LVC-OT**. ANG staff will continue coordination with COCOM, MAJCOM, USAF/DoD Foreign Military Sales and International Affairs offices that inquire regarding DMO possibilities for BPC. Initial DMO capability for approved cases will be with an isolated enclave with the ANG DTOC, and future efforts will allow DMO with connected ANG and USAF warfighters.

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