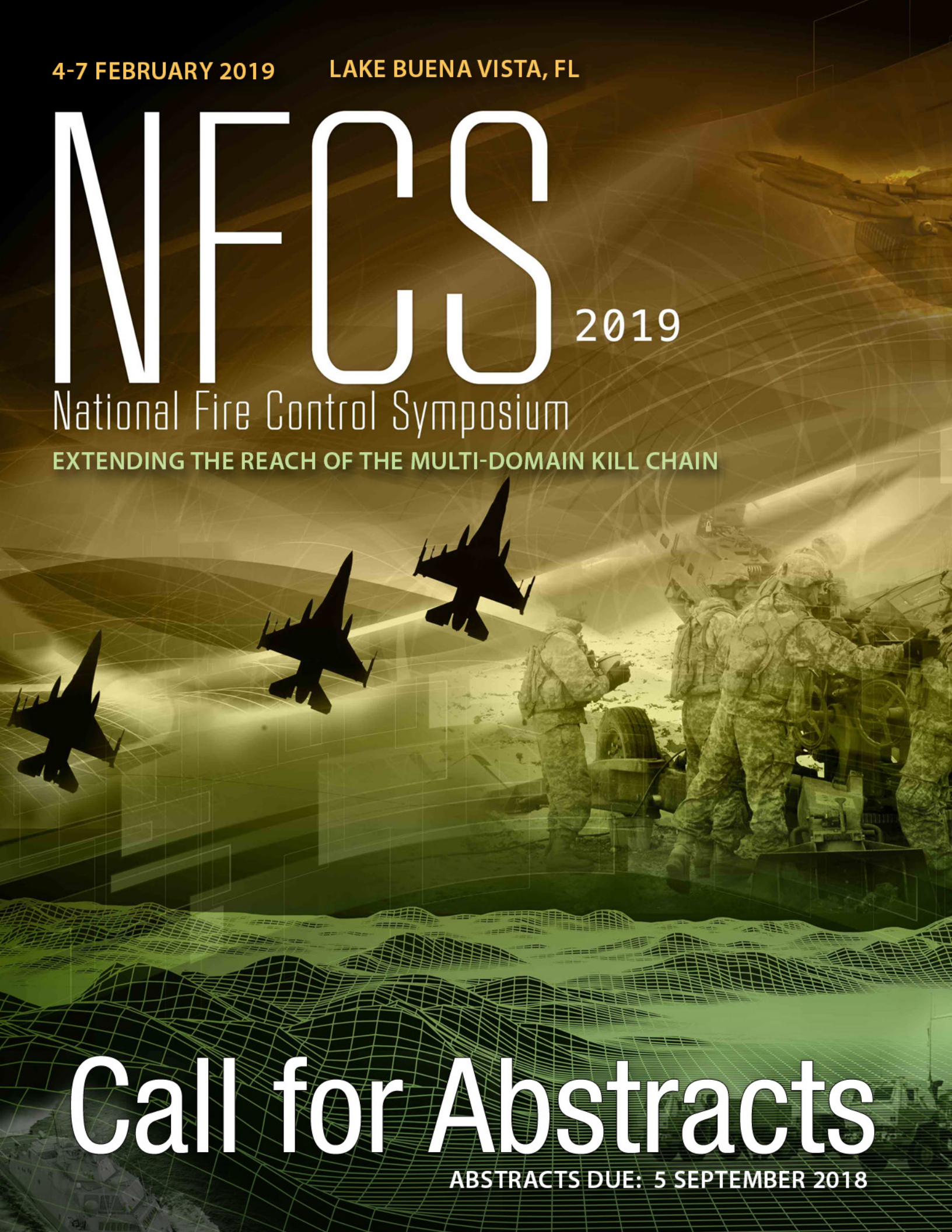
4-7 FEBRUARY 2019
LAKE BUENA VISTA, FL
NFCS 2019
National Fire Control Symposium
EXTENDING THE REACH OF THE MULTI-DOMAIN KILL CHAIN
Call for Abstracts
ABSTRACTS DUE: 5 SEPTEMBER 2018

NFCS 2019
National Fire Control Symposium

Abstracts Due: 5 September 2018
EXTENDING THE REACH OF THE MULTI-DOMAIN KILL CHAIN
4-7 February 2019 Lake Buena Vista, FL

YOU'RE INVITED

We invite you to participate in the 26th National Fire Control Symposium which will take place at the Army's Shades of Green Hotel, in Lake Buena Vista, FL, 4 - 7 February 2019. The NFCS, heralded as the premiere forum for discussing the entire kill chain, has served the Integrated Fire Control Community of Interest (IFC-COI) for over two decades. Due to its restricted and no-foreign format, the NFCS is in a unique position to cultivate lasting relationships between the forward operators, service communities, warfare centers, laboratories, and our industry partners.

Initially launched in 1992 by the Air Force, and subsequently supported by the Army, Navy, and Marines, the NFCS is now an industry sponsored event. The 2019 event features a lead technical advisorship by the Army. The event has been successful in engaging the multi-services, industry, and academia in synergistic relationships and discussions. With continued reduction in budgets, the government has an increasing reliance on cooperative research efforts. The size and focus of the NFCS promotes a greater number of productive contacts and collaborative relationships, provides an overview of a larger number of external research efforts, and provides U.S. researchers with a deeper understanding of the state-of-the-art and the warfighter's perspective. The net result is the potential reduction in duplication of work completed by academia, industry, and the services, as well as the promotion of scientific advances resulting from joint efforts that could save DoD valuable time and financial resources, while defining innovative solutions to technology challenges.

Along with concurrent technical sessions offered throughout the week, attendees can attend a flag level Plenary Session, special topic presentations, a technical poster session, an exhibit area, and many networking and collaboration functions. The topics chosen will support the 2019 theme "Extending the Reach of the Multi-Domain Kill Chain" which is critical in keeping the U.S.'s advantage.

We encourage you to engage in this event and look forward to seeing you at the Shades of Green in February 2019!

PLEASE ALSO CONSIDER ...

Exhibiting

NFCS has limited space for exhibits and demos and last year was a sold out show. Sign up now to reserve your space for this great networking & marketing opportunity. To register for an exhibit, visit https://www.usasymposium.com/nfcs/exhibits.php.

Sponsoring

NFCS is made possible in large part by our Industry Sponsors. Thanks to all who contribute each year and make this event a success. Sponsorship is a great way to get your company's name in front of a very tailored audience that your company engages with. Each sponsorship package comes with many great amenities. If you'd like more information on sponsorship opportunities with NFCS, please visit https://www.usasymposium.com/nfcs/sponsorship.php or contact Erin Foster at efoster@blue52productions.com.

Nominating Someone for the David M. Altwegg Lifetime Achievement Award

We are currently accepting nominations for the David M. Altwegg Lifetime Achievement Award. For more information on this award and access to the submission form, visit https://www.usasymposium.com/nfcs/awardprogram.php.

KEY DATES TO REMEMBER

- 15 August 2018 - David M. Altwegg Life Achievement Award Nominations Due
- 5 September 2018 – Abstracts Due
- Mid October 2018 – Abstract Authors Will Be Notified
- 4 January 2019 – Final Presentations Due
- 4 January 2019 - Optional Papers Due
- 4 - 7 February 2019 – Symposium

TECHNICAL TOPICS

TOPIC 1: ENABLING JOINT FIRE CONTROL: WARFIGHTER CHALLENGES & OPERATIONAL LESSONS LEARNED

Integrated fire control kill-chains utilizing multi-mission sensors and weapons platforms are a crucial capability to enhance U.S. and Joint Forces effectiveness in all theaters. The operational arena consists of an expansive, dynamic security environment, rapidly evolving threats, and the global significance of maintaining stability and security in key regions across the full spectrum of operations. This topic will look to gain insight on those key challenges facing warfighters and the operational security concerns posed by regional peer or near peer competitors, current day pacing threats and associated rapid evolution, the need to preserve access in all shared domains, the effect on operations/employment, and joint, allied, and nation tactics, and techniques and procedures (TTPs) associated with multi-domain/cross domain fires. Warfighter discussions of lessons learned from these operational experiences provide invaluable insight for engineers, scientists, researchers, and product developers. Submissions by those actively engaged in field operations are encouraged to provide context to the "fight tonight" imperative and capability needs related to integrated kinetic and non-kinetic kill chain with topics such as:

- Service/warfighting component missions, priorities and challenges;
- Operational/tactical implications associated with bilateral defense treaty alliances;
- Capability gaps associated with interoperability, joint IAMD/BMD fires in air, surface, and subsurface domains;
- Lessons learned from operational employment, exercises, experiments, and wargames associated with joint and allied/partners (software; hardware; TTPs; CONOPs);
- Multi-service TTPs for kinetic/non-kinetic engagements to counter advanced threats, along with integration of engagement capabilities across Services;
- Integrated kill chains utilizing multi-mission sensors, platforms and multi-mission Systems-of-Systems (SoS) for planning, track management, and engagement;
- Integration/multi-mission networked teaming of manned/unmanned-autonomous capabilities to expand the reach of the kinetic/non-kinetic kill chain;
- Automated battle management aids for data fusion, combat identification, and engagement management; and
- Addressing near and far term technologies that counter hypersonic, ballistic and air-breathing missiles and asymmetric threats.

TOPIC 2: KILL CHAIN & DISTRIBUTED LETHALITY

Engagements against targets in a contested, Anti-Access/Area Denial (A2/AD) environment require rapid execution of the kill chain in the face of ever more complex and difficult combat environments: (1) mobile and extended range target engagements compress decision times; (2) advanced sensors provide high volumes of raw data that must be processed to extract target information; (3) expectations of precision targeting at long ranges extend kill chain execution times; and (4) coordinated actions by distributed forces require reliable data exchanges for command and control. "Kill Chain & Distributed Lethality" will consider approaches to accelerating and improving all links of the kill chain for air-to-surface, air-to-air, surface-to-air, surface-to-surface, and subsurface-to-surface engagements. In addition, this topic will explore the innovative algorithmic, architectural, hardware, software, and system integration solutions; near-term operational lessons learned; the legal decisions and processes involved in target selection; and current and emerging fire control requirements for all Services. All aspects of the kill chain are open for discussion along with technological improvements, including but not limited to:

- Use of artificial intelligence and machine learning;
- Multi-target tracking and geolocation for rapid target location;
- Rules of engagement;

TECHNICAL TOPICS

- Integration of heterogeneous systems;
- Automated battle management aids;
- Command and control improvements to reduce decision time lines;
- Closing the loop with battle damage assessment;
- Integrated fire control mission expansion; and
- Pushing engagement decisions forward to the platform.

TOPIC 3: ADVANCED TECHNOLOGIES

Emerging concepts and technologies will be part of the warfighter's future arsenal and fire control capabilities. These are the "seed corn" for advanced fire control sensors and systems and the technology game changers that will give tomorrow's military forces break-through capabilities and overwhelming advantages in future conflicts within both the conventional and unconventional (asymmetric) environments. This topic addresses:

- Emerging techniques in automation and cooperation for searching, identifying, tracking, and engaging fixed and mobile targets (e.g. machine learning/AI, multi-static/multi-INT search track and ID, cooperative weapon concepts);
- Human/automation integration concepts;
- Multi-function systems;
- Advanced radar and passive RF concepts (e.g. adaptive digital beamforming, direction finding, wide-band array concepts, etc.);
- RF photonics technologies for fire control/EW;
- Air-to-Air (A-A) & Air-to-Ground (A-G) tactical laser radar approaches/concepts;
- Advanced Infrared Search and Track (IRST) concepts (e.g. passive ranging, enhanced clutter suppression);
- Lethal and non-lethal target effect mechanisms;
- Techniques for searching, identifying, tracking, and engaging fixed and mobile targets;
- Decision aids that include the human factor;
- "Free Space Optics" use for real-time tactical data exchanges;
- Communication techniques (to include data link architecture);
- Data exploitation algorithms/ techniques; and
- Electronic Warfare (EW) techniques to assure robust fire control solutions.

Important Notices

Travel Restrictions & Approval

For those working for government agencies, you are encouraged to submit your travel requests now. Though travel restrictions for many government agencies have been loosening, some still require many months advance notice with conference travel. Because of this, we encourage you to get your paperwork submitted ASAP and contact us if you need any additional information or justification.

Event Information Security

This Symposium is restricted to U.S. PERSONS ONLY, and those with a final SECRET Clearance (no Interim clearances). This Symposium is not open to the general public.

TECHNICAL TOPICS

TOPIC 4: COMBAT ID

Development and deployment of a reliable and accurate Combat Identification (CID) capability for warfighters is critical to the success of fire control for future military operations. CID enables the warfighter to locate and identify critical targets with high precision, permits use of long-range weapons, aids in fratricide reduction, enhances battlefield situational awareness, reduces leakage and waste, and reduces exposure of U.S. Forces to enemy fire. Combat ID invites abstracts addressing all functional elements of cooperative and non-cooperative CID for air-to surface, air-to-air, surface-to-air, ballistic missile defense, and surface to-surface engagements, including:

- Multi-spectral systems;
- Active and passive ID technologies;
- Monostatic and bistatic techniques;
- Autonomous and aided;
- Long-range approaches;
- Search and track;
- Signal and data processing;
- Segmentation;
- Feature extraction;
- Discrimination;
- Disaggregated concepts;
- Cross-domain data correlation; and
- Network enabled and distributed CID.

This topic will explore the innovative algorithmic, architectural, hardware, software, and system integration solutions, as well as near-term operational lessons learned, the legal decisions and processes involved in CID, and current/emerging CID requirements for all services.

TOPIC 5: HYPERSONICS/CONVENTIONAL PROMPT STRIKE & HYPERSONIC THREAT DEFENSE

The ability to provide a conventional precision strike on time-sensitive and critical targets is of extreme importance to the DoD, as is the ability to defeat the adversaries' hypersonic weapons. This topic is devoted to examining the various service and agency capabilities and the technologies and testing associated with achieving hypersonic velocities, advanced flight dynamics, and defeating hypersonic threats. Hypersonic cruise and glide threat vehicles present unique challenges to our defenses including very high speeds, high-G maneuvers, low detectability, exo- and endo-atmospheric flight, difficult endgame dynamics, and demanding reaction times. This topic area will examine technologies, capabilities, and experimentation to defeat these threats with both hardkill and softkill techniques. Areas of interest include:

- Compressing the kill chain to reduce our adversaries' decision time;
- Thermal protection;
- Aero design;
- Flight control;
- Navigation and guidance;
- Propulsion;
- Flight vehicle integration; and
- Other topics specific to achieving hypersonic velocities and placing the weapon on target.

TECHNICAL TOPICS

TOPIC 6: CYBER WARFARE (THREAT, EXPLOITATION, ASSURANCE, ATTACK & DEFENSE)

Ranging from the low-end capabilities of individual actors to high-end and well-funded strategic efforts, cyber warfare is the most prevalent, persistent, and pervasive form of attack facing the DoD and the national infrastructure. Continuous probing and successful attacks are pervasive. The ability of our military to operate under these conditions requires fire control systems that are robust and resilient under cyber attack. This is particularly challenging given the threat is increasingly easy and inexpensive to deploy and very complex to defend against. This topic invites abstracts addressing all aspects of fire control in the cyber warfare domain, including:

- Design and defense of cyber software, hardware, techniques, and networks from supply chain through operations;
- Cyber situational awareness (including sensing, characterization, tracking, and understanding);
- Adaptive/dynamic defense technologies/techniques, including planning, coordination, and execution;
- Computer network operations and resiliency (under cyber attack);
- Modeling, simulation, and metrics of systems, networks, vulnerabilities, and threats;
- Information assurance addressing confidentiality, integrity, and availability;
- Cyber security for platforms (ships, aircraft, and ground vehicles), weapons and weapon systems, and their supporting infrastructures (avionics, HM&E, etc.);
- Coordinating and integrating offensive cyber, electronic warfare, and kinetic effects (cyber integrated fires) to include strategic level and operational level decision making associated with cyber ops employment; and
- Metrics, results, and analysis from field tests, experiments, or deployments.

TOPIC 7: DIRECTED ENERGY

Directed Energy (DE) technology has reached the stage where services are maturing the doctrine and tactics associated with the integration of DE weaponry into the operational capability of our military. It has long been seen as a "weapon of the future," but the technology has advanced, and continues to advance so rapidly that the operational realities need to be addressed. They will have the inherent ability for quick, highly accurate engagement of threats with little or no collateral damage for hardkill and non-lethal solutions. The very nature of the weapon that allows for the highly accurate engagement also presents a new challenge to traditional methods of fire control. The symposium would welcome all DE related abstracts addressing, but not limited to:

- The recommended mix and integration of DE and kinetic systems;
- Operational and training considerations when employing DE;
- DE system overviews and CONOPs;
- Command and control challenges and recommended solutions;
- Ethical, legal, and political ramifications of employing DE weapons;
- Optimal employment environments for DE; and
- Technology advances in power reduction and range extension.

TOPIC 8: ELECTROMAGNETIC SPECTRUM WARFARE

Electromagnetic Spectrum Warfare (ESW) is the warfighting approach to gain decisive military advantage in the electromagnetic spectrum (EMS) to enable freedom of action across all military mission areas, while incorporating Electronic Attack (EA), Electronic Warfare Support (ES), Electronic Protection (EP) and Battle Management. ESW and its associated active and passive activities directly support the overall fire control capabilities of operational forces. ESW will drive changes in operational CONOPS to better leverage and employ capabilities across all warfare areas. This topic area welcomes all ESW related abstracts supporting kinetic/nonkinetic kill chain effects and capabilities, addressing:

TECHNICAL TOPICS

- Battlespace awareness (sensing and understanding the operational environment, as well as affecting the enemy's perception, actions and force employment);
- Maneuverability (spectral and physical agility);
- Integrated fires (kinetic and non-kinetic);
- Integration of EA and ES capabilities and mission technology drivers; and
- Assured command and control/proactive battle management, while also leveraging AI.

TOPIC 9: ELECTRONIC WARFARE

Electronic Warfare (EW) is becoming a weapon and capability of choice given the current emphasis on affordability, re-use, and minimizing collateral damage – especially in urban environments. EW systems and capabilities have an increasing role in fire control --- whether it is enemy Electronic Attack (EA) against U.S. radars, Electro-Optical (EO) or Infrared (IR) systems; U.S. EO/IR Countermeasures; Electronic Protection (EP) of U.S. systems; U.S. EA systems targeting enemy radars and missiles (i.e., softkill weapons); or Electronic Warfare Support (ES) to improve situational awareness. Effective EW is becoming increasingly important in order to successfully defeat coordinated enemy raids. This topic invites abstracts addressing all aspects of EW considered in the context of fire control and electronic fires effects, including:

- Integration and coordination of hardkill and softkill weapons and capabilities to increase fires effectiveness;
- Recent developments in RF or EO/IR targeting systems to mitigate enemy countermeasures;
- CONOPS/technologies for Fire Control in GPS - denied or communications-denied environments;
- RF EW systems;
- EO/IR countermeasures systems;
- Improved softkill systems (active and passive) and enhanced deployment of softkill resources to increase performance and reduce resource expenditure;
- Cognitive EW systems;
- Spectrum management for effective sensor or communications operations in jamming environments;
- Open architecture and Service Oriented Architecture (SOA) concepts for electronic warfare; and
- Results from field tests, experiments, or deployments.

TOPIC 10: FIRE CONTROL PLATFORM CAPABILITIES

Fire control performance is directly dependent on a number of factors, from environmental impacts to the performance of platform-specific systems and sub-systems, including hardware and software. This topic focuses on fire control solutions from a platform perspective, in the space, air, land and maritime (both surface and sub-surface) domains. Discussion and analysis of the impact of the design and configuration of the platform on fire control system performance is invited. In addition to considering offensive fire control performance, this topic also addresses defensive capabilities that enable the fire control system to perform in highly contested environments. Other areas included in this topic are:

- System performance predictions, including consideration of environmental impacts;
- Live fire test results;
- Lessons learned on weapon, sensor, platform integration issues (interoperability);
- Platform fire control tactics, techniques, and procedures;
- Ongoing and planned platform fire control upgrades; and
- Integrated, multi-platform fire control solutions.

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TOPIC 11: INTEROPERABILITY & NETWORK ENHANCED FIRE CONTROL

The organic effectiveness of weapon systems is enhanced when integrated with other sensors and weapons. Joint systems can leverage networked or shared information from other manned/unmanned platforms to achieve greater overall capability, with the potential to substantially improve joint and coalition operations to enable distributed lethality and integration of systems into an interoperable kill/effects chain. This topic will address:

- Current issues with multi-generational/allied networks and platforms;
- Sensor, weapon and platform netting to integrate lethal and non-lethal effects;
- Assured C2/Battle management with disparate networks/datalinks across the effects chain;
- Agile communications and resilient network control of manned/unmanned platforms;
- Multi-domain fusion and integration (real and non-real time) and associated multi-level security integration;
- Combat identification and composite track management;
- Automated C2/battle management aids including planning tools, resource management tools, and real-time execution aids to improve joint tactical edge integration; and
- Integrated and cooperative weapon and fire control systems, distributed weapons, integration of kinetic/non-kinetic effects and sensor coordination across disparate networks.

TOPIC 12: LIVE, VIRTUAL, & CONSTRUCTIVE MODELING & SIMULATION

Live, Virtual, and Constructive (LVC) Modeling & Simulation (M&S) in tactical scenarios plays an increasingly important role in the development, assessment, and organizational training of integrated fire control capabilities. As the number, diversity, and complexity of interconnected fire control systems grow, field testing the resulting "integrated" capability becomes increasingly expensive and logistically demanding, requiring the coordination of assets from across the services. These same considerations pose significant limitations on the accomplishment of training objectives once systems are successfully fielded. Abstracts covering any technical aspect of LVC testing, M&S, or wargaming and training exercises are encouraged. Of particular interest are abstracts discussing:

- Existing modeling, simulation, and wargaming capabilities, lessons learned, trade-offs, and limitations of different distributed simulation methodologies;
- Technologies for analyzing and visualizing large sets of simulation output data;
- Efficient computer processing architectures and unique verification and validation challenges;
- Modeling and simulation that address the cyber threat (analysis, effects, etc.); and
- Leveraging LVC environments to mature AI/ML in warfighting mission areas.

TOPIC 13: MULTI-DOMAIN COMMAND & CONTROL AND INTELLIGENCE, SURVEILLANCE & RECONNAISSANCE

Multi-Domain Battle Operations/Command and Control & Intelligence, Surveillance & Reconnaissance is critical to the warfighter's ability to deliver precision effects through the integration across domains with advanced networking, integrated sensor approaches, and multi-node collaboration/decision support tools. Abundant challenges exist to enable tasking, collection, processing, exploitation, dissemination, and management of the extensive and diverse set of data sources to rapidly orient to evolving threats. These core capabilities and mission needs are imperative to provide warfighters with timely, decision quality and actionable combat data at the tactical edge. Abstracts are sought for current and proposed systems and technologies that address these challenges and improve the warfighter's ability to deliver precision effects through the integration of Battle Management/C2 and ISR capabilities to enable freedom of action.

TECHNICAL TOPICS

Examples of topics include, but are not limited to the following:

- Manned/unmanned-machine teaming, mission management and netted capabilities (terrestrial, airborne and space based);
- Coordination and tasking across sensors owned and operated by different services/agencies;
- Enabling technology/sensors (EO/IR, LADAR/LINDAR multi-spectral, RF, EW, etc.) and associated tactical decision aids to enable tactical edge BMC2;
- Executing C2/multi-domain battle management associated with littoral operations in the contested environment;
- Tasking, Collection, Processing, Exploitation and Dissemination (TCPED) architectures to enable battlespace awareness, assured C2, and integrated fires; and
- System-of-systems approach to network kinetic/non-kinetic fires across multiple domains, platforms, and services/mission partners.

TOPIC 14: RAPID TRANSITION OF NEW TECHNOLOGY TO THE WARFIGHTER

DoD continues to transform into a lighter, highly flexible, and more effective fighting force. Changes on the battlefield accelerate the need for speed and efficiency in meeting warfighter needs. In a fiscally constrained environment, new capability development often requires being reliant on mature and adaptable technology with short acquisition schedules. This topic will focus on supporting fire control in the following areas:

- New, innovative, and potentially disruptive technologies at significant maturity levels;
- Rapid fielding of capabilities; and
- Quick response technology bridging the acquisition gap.

TOPIC 15: SENSOR RESOURCE MANAGEMENT/SENSOR & DATA FUSION

As our fire control systems become more complicated utilizing multi-sensor inputs (EO, IR, RF, offboard), there needs to be a capability to fuse sensor data, as well as integrate and manage onboard and dispersed sensors to reach a fire control solution. This topic includes sensor fusion at the data, feature, and decision levels. Additionally, abstracts will be accepted that address Sensor Resource Management (SRM) technologies that incorporate SRM as a top tier system-of-systems function with real-time (or near real-time) interfaces to battle management and planning, command, and control such as:

- Cooperative own-ship SRM;
- Multi-ship manned and unmanned SRM;
- Synchronization and coordination across the classical functions of electronic warfare, radar, communications;
- Minimization of co-site interference and friendly jamming;
- SRM architectures: centralized, distributed, or hierarchical;
- All tactical avionics (radar, EW, EO/IR, communications) on next-gen aircraft; and
- Algorithms and processes to generate optimal allocations of sensor resources.

TOPIC 16: THEATRE & HOMELAND JOINT INTEGRATED AIR & MISSILE DEFENSE

Theatre & Homeland Joint Integrated Air & Missile Defense, supporting both Homeland Defense and Operational Forces, continues to evolve from organic sensor-shooter systems to networked sensing, decision tools, and weapon elements that can support integrated fire control. These capabilities can expand the defended battlespace; accommodate multiple engagement conditions by improving defense capability

against a full spectrum of threats to include cruise missiles, ballistic missiles, fixed-wing and rotary-wing aircraft, individual and swarming unmanned vehicles (UAV), rockets, artillery and mortars, and extend the radar horizon limitations. This topic invites abstracts addressing any aspect of these areas including:

- IAMD system architectures;
- Critical integrated fire control enablers including coherent air picture, timely and assured CID, and threat discrimination;
- Integrated cruise and ballistic missile defense;
- IAMD operations planning, command, and control challenges and solutions;
- Engagement of low velocity, small cross section threats such as UAV's;
- Weapon system resource balancing in integrated systems;
- Counter Rocket Artillery and Mortar (CRAM) capabilities for fixed sites and/or maneuver forces;
- Automated battle management aides (ABMA);
- Joint, multi-mission IAMD (collaborative) planning;
- Multi-mission operations;
- Raid engagement;
- Command and control systems;
- Networks and information management systems;
- Sensing and weapons management coordination;
- Consequence management – determining where to engage a target relative to potential collateral damage;
- Integrated fire control testing and resulting lessons learned; and
- IAMD training.

TOPIC 17: SUBSURFACE WARFARE

Undersea and subterranean warfare continues to be an increasingly complex operational environment for offensive and defensive military operations, and is a developing area for integrated fire control concepts. Subsurface situational awareness is critical for military advantage. New concepts for unmanned systems and distributed underwater sensors are being developed and fielded. Maintaining the military advantage in the undersea environment is important for safe commercial shipping and defense of surface ships and submarines. The detection, classification, and targeting of tunnels and buried land targets present a different yet similar set of challenges to the undersea problem. Examples of topics include, but are not limited to the following:

- Undersea data fusion, sensors, and sensor management;
- Offensive and defensive mine warfare;
- Undersea weapons selection and coordination;
- Subsurface situational awareness;
- Undersea unmanned vehicles;
- Targeting subsurface threats;
- Targeting above surface threats from under the sea;
- The rapid exchange of data across the air-surface-subsurface interface;
- Multi-domain data fusion, sensors, and sensor management; and
- Targeting buried objects.

TOPIC 18: UNMANNED & AUTONOMOUS SYSTEMS (SENSORS, WEAPONS & PLATFORMS, INCLUDING COUNTER UAS)

Unmanned systems continue to expand their presence on the battlefield from strategic High Altitude Long Endurance (HALE) systems conducting strategic surveillance, down to small hand launched systems. Today many unmanned systems serve to carry Intelligence, Surveillance, and Reconnaissance (ISR) sensors or

communications relay payloads, while a number of platforms are being weaponized. Unmanned systems of all types will continue to be an integral part of modern-day combat fire control. This topic invites abstracts that focus on any fire control related aspect of these platforms (whether in the air, on the ground, on the surface, or underwater) and will include, but are not limited to such key topics as:

- Capabilities and characteristics of the unmanned platforms themselves;
- Descriptions and capabilities of fire control systems utilized to counter UAS threats;
- Descriptions and capabilities of their current/planned sensor payloads;
- Descriptions and capabilities of current/planned weapons payloads;
- Networks/architectures/data links for passing sensor data to ground stations and/or to other platforms as part of network-centric operations;
- Proposed new CONOPS leveraging unmanned systems capabilities;
- Integrated manned and unmanned operations;
- Tools for timely exploitation/dissemination of data coming back from unmanned systems;
- Results of actual field tests/experiments/deployments involving them; and
- Kill chain for use with unmanned platforms operating autonomously or in support of manned platforms to support precision weaponry.

TOPIC 19: UTILIZING SPACE AS A FORCE ENHANCER OR FORCE APPLIER

Space operations impact our warfighters' effectiveness and provide indispensable strategic, operational, and tactical capability. This is especially true in A2/AD environments where space assets may provide our only visibility deep in denied territory. Our need for accurate and timely fire control requires situational awareness that, in turn, requires persistent intelligence, surveillance & reconnaissance, and connectivity in the tactical theater, specifically in active combat locations. This topic seeks abstracts that address:

- Robust rapid cross force coalition space-based communication critical to accurate fire control;
- Strong space domain and battle space situational awareness;
- Use of space to boost the kill chain's effectiveness;
- Current, planned, or future activities that use space and/or space assets to improve fire control (e.g., space-based and space-enabled persistent surveillance and reconnaissance systems, SATCOM links, positioning, navigation and timing systems, strike platforms that use space assets, sensor platforms, and geo-registration); and
- Vulnerabilities of space-based assets and associated downlinks.

TOPIC 20: WEAPONS, MUNITIONS & ENGAGEMENT ALTERNATIVES

There are many options available for weapon engagement that are enabled by the future of netted systems and the increasing array of available weapons. The ability to engage targets globally is still a high priority that brings its own set of challenges. This topic will focus on one or more of the following areas:

- The cognitive aspects of target engagement as a function of the growing number of engagement options (ensuring the most effective munition is chosen to support operational plans);
- Ways to achieve desired effects on global targets to include hypervelocity, multi-attack, and kinetic/directed energy weapon options;
- How to deal with operation constraints such as minimizing collateral damage;
- Precision targeting techniques;
- Understanding systems-of-systems of weapons within Fire Control;
- Next generation weapon systems development (such as electric weapons, lasers, hypervelocity projectiles, hypersonic weapons, etc.); and
- Integration of new weapon systems.

ABSTRACT SUBMISSION

Abstract Due Date: 5 September 2018
To submit your abstract, visit https://www.usasymposium.com/nfcs/cfa.php

We look forward to receiving your abstract(s) for the 2019 NFCS. This event is conducted at the SECRET//NOFORN level. Attendance is limited to U.S. citizens with a final SECRET clearance. Final presentations should not be more restrictive than Distribution D.

ABSTRACT & SUBMISSION REQUIREMENT CHECKLIST

- ❑ Abstracts must be unclassified.
- ❑ Abstracts must carry a distribution level of A, C, or D.
  - A = Approved for public release, distribution unlimited
  - C = U.S. Government Agencies and their contractors only
  - D = DoD and U.S. DoD contractors only
- ❑ Submissions more restrictive than Distribution A should be password protected with passwords being sent to Sherry Johnson at sjohnson@blue52productions.com. More detailed instructions for password protecting and submitting your abstracts can be found on the submission page on-line.
- ❑ Abstracts should be relevant to one or more of the topics described on the previous pages.
- ❑ Abstracts should clearly demonstrate relevance to the Symposium theme, "Extending the Reach of the Multi-Domain Kill Chain."
- ❑ Abstracts should be no more than 400 words long.
- ❑ Abstracts should include the title of your abstract in the body of the submission
- ❑ Abstracts must contain an unclassified outline containing the key points of your presentation (this does not count against the 400 word count)
- ❑ Abstracts should clearly express: 1) objective, 2) relevance to the proposed topic area(s), 3) scope, and 4) conclusions of your presentation.
- ❑ Abstracts that do not support the theme or the technical topics, or do not provide technical (vs marketing) content, may not be accepted for oral or poster presentation.

Note: Because of the rapid growth of the conference over the past few years, we are expecting a high number of submissions for the 26th NFCS. Presentations that have content beyond the unclassified level, are clearly associated with the proposed topic area(s), and are relevant to the Warfighter needs will have the highest probability of selection.

NOTIFICATION & PRESENTATION INFORMATION

In mid October 2018, you will be contacted regarding the status of your acceptance. Please note that selected abstract titles will be included on the website and in the program. Therefore, abstract titles for this purpose must be cleared for public release. You will have a chance to submit a Distro A title after notification of selection. All abstracts will fall into one of four selection categories: oral presentation, alternate oral presentation, one-on-one poster presentation, or not accepted. (An alternate oral presentation is a presentation in stand-by mode until an oral presentation slot becomes available. Alternates should plan to present their material as a poster presentation and be prepared to be called upon for an oral presentation at the last minute). Poster presentations are an important facet of the NFCS and provide dedicated one-on-one exchanges between the presenter and the attendees. Poster awards are given in recognition of quality content and will be recognized at the NFCS Reception. Oral presentations are limited to 20 minutes and this includes time for questions. Presenters should plan for 17 minutes for the presentation, 2 minutes of questions, and 1 minute for transition on and off the stage. Please note that selection and presentation of an abstract, whether oral or poster, does not waive any applicable registration fees.

PLEASE DO NOT WAIT FOR NOTIFICATION OF ACCEPTANCE TO SUBMIT A TRAVEL APPROVAL REQUEST WITHIN YOUR ORGANIZATION. START THAT PROCESS NOW.