



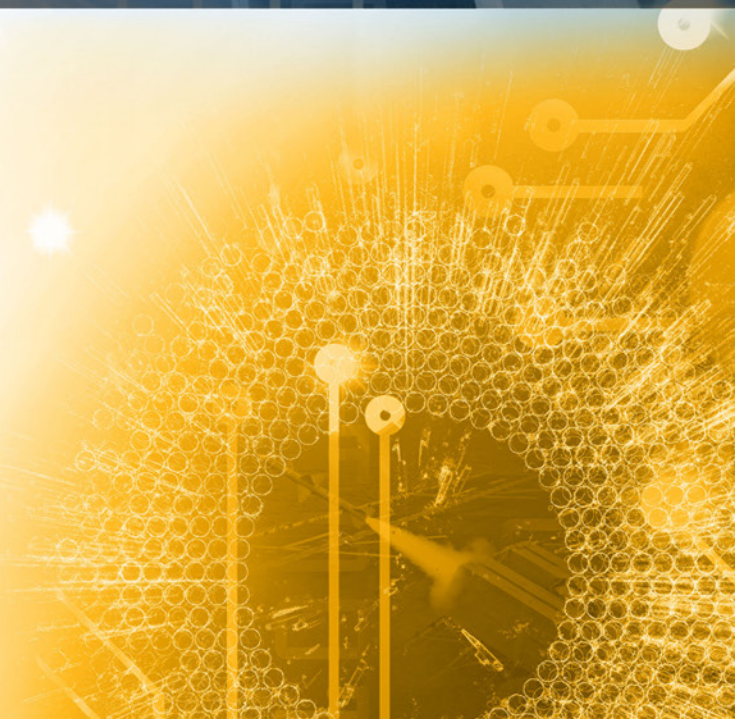
Call for Abstracts

SHARPENING THE SPEAR – STRENGTHENING THE WARFIGHTER

NFCS

2018

National Fire Control Symposium



PLEASE JOIN US!

We invite you to participate in the 25th NFCS Symposium which will take place at the Hale Ikena Conference Center on Ft. Shafter in Honolulu, Hawaii 5 - 8 February 2018, plus an optional tour on Kauai on 9 February. This site was specifically encouraged by the NFCS Advisory Committee to bring the event closer to the operators. The numerous service and joint commands, located on the island of Oahu, will provide ample opportunity to engage with operators tasked to provide our country with frontline defense. 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 2018 event features a lead technical advisorship by the Navy. 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, a science and technology round table with senior S&T advisors as panel members, a special topics session focused on the challenges of today's operators, a technical poster session, an exhibit area, a tour to the Pacific Missile Range Facility, and many networking and collaboration functions. The 2018 theme "Sharpening the Spear – Strengthening the Warfighter" is intended to build upon the dialogue initiated by PACFLT in the "Sea of Dreams" conference held in September 2016. The 2018 presentation selection will emphasize solutions to the issues raised during that initial discussion and will cover additional topics included on the following pages.

There are a variety of opportunities for you to maximize your participation including attending, presenting, networking, exhibiting, and sponsoring. We encourage you to engage in this event and look forward to seeing you in Hawaii on 5 February 2018!

KEY DATES TO REMEMBER

- **6 SEPTEMBER 2017 – Abstract Due Date**
- **EARLY OCTOBER 2017 – Abstract Authors Will Be Notified**
- **5 JANUARY 2018 – Final Presentations Due**
- **11 JANUARY 2018 – Sponsorship Payments Due**
- **5 - 9 FEBRUARY 2018 – Symposium & Tour**

TECHNICAL TOPICS

TOPIC 1: PACOM WARFIGHTER CHALLENGES

As one of the most challenging geographic Combatant Command Areas of Responsibility (AORs), PACOM consists of an expansive, dynamic security environment, rapidly evolving threats, and the global significance of maintaining stability and security in the Indo-Asia Pacific region. This topic will look to gain insight on those key challenges facing warfighters and the operational security concerns posed by regional peer/near peer competitors, the threat of ISIS, need to preserve access in all shared domains, militarization advancements in strategic areas such as the South China Sea and the effect on operations/employment, and joint/allied and nation tactics, and techniques and procedures (TTPs) associated with multi-domain/cross domain fires. Submissions by those actively engaged in PACOM operations are encouraged to provide context to the “fight tonight” imperative, advancement of joint TTPs, and capability needs related to integrated fires with topics to include:

- PACOM Service component missions, priorities and challenges;
- Operational/tactical implications associated with bilateral defense treaty alliances;
- Capability gaps associated with joint IAMD/BMD fires in air, surface, and subsurface domains;
- Lessons learned associated with ongoing joint and allied/partner operations;
- Multi-service TTPs for kinetic/non-kinetic engagements to counter advanced threats; and
- Integration/multi-mission networked teaming of manned/unmanned-autonomous capabilities to expand the kill chain.

TOPIC 2: KILL CHAIN & DISTRIBUTED LETHALITY

Engagements against targets in an 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:

- Multi-target tracking and geolocation for rapid target location;
- Rules of engagement;
- Integration of heterogeneous systems;
- Automated battle management aids;
- Command and control improvements to reduce decision timelines;
- Closing the loop with battle damage assessment;
- Integrated fire control mission expansion; and
- Pushing engagement decisions forward to the platform.

TECHNICAL TOPICS

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:

- Multi-function systems;
- 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) and data exploitation algorithms/ techniques; and
- Electronic Warfare (EW) techniques to assure robust fire control solutions.

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 wastage, 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:

- Search;
- Signal processing;
- Segmentation;
- Cross-domain data changes;
- Feature extraction;
- Long range active and passive ID technologies and approaches;
- Autonomous and aided;
- Disaggregated concepts;
- Discrimination; 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.

TECHNICAL TOPICS

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 session will be 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. 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.

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.

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 situation 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 operation level decision making associate with cyber ops employment; and
- Metrics, results, and analysis from field tests, experiments, or deployments.

TECHNICAL TOPICS

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 MANEUVER WARFARE

Electromagnetic Maneuver Warfare (EMW) is the Navy’s warfighting approach to gain decisive military advantage in the electromagnetic spectrum (EMS) to enable freedom of action across all Navy mission areas. EMW and its associated active and passive activities directly support the overall fire control capabilities of operational forces. Success demands a holistic systems-of-systems focus looking not only at the systems themselves, but also the “interstitial” space which is the dimension between the systems. EMW will require coordination and integration across all domains from land, sea, subsurface, air, cyber, and space. Dominance of the EMS is a key enabler to all domain access. EMW will drive changes in operational CONOPS to better leverage and employ capabilities across all warfare areas. This topic area welcomes all EMW related abstracts supporting Fire Control capability, addressing, but not limited to, the four tenets of EMW:

- Battlespace awareness (sensing and understanding the operational environment, as well as affecting the enemy’s perception);
- Maneuverability (spectral and physical agility);
- Integrated fires (kinetic and non-kinetic); and
- Assured command and control.

TOPIC 9: ELECTRONIC WARFARE

Electronic Warfare (EW) is becoming a weapon of choice given the current emphasis on affordability, re-use, and minimizing collateral damage – especially in urban environments. 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 - EW has an increasing role in fire control. This topic invites abstracts addressing all aspects of EW, including:

- 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;

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- EO/IR countermeasures systems;
- Improved softkill systems (active and passive) and enhanced deployment of softkill resources to increase performance and reduce resource expenditure;
- Coordination of hardkill and softkill weapons to increase effectiveness;
- 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: ENABLING JOINT INTEGRATED FIRE CONTROL, ADDRESSING PACFLT “SEA OF DREAMS” CHALLENGES & EVENTS

Integrated fire control kill chains that utilize multi-mission sensors and weapons platforms are a crucial capability to enhance U.S. and Joint Forces effectiveness in a wide variety of theaters. Specific challenges face the Pacific Fleet in support of the “Pivot to the Pacific Rim”, as discussed in the 2016 Sea of Dreams Conference. This topic covers engagement of the multi-mission threats, at home and abroad, to include:

- Integrated multi-mission Systems-of-Systems (SoS) for planning, track management, and engagement;
- Automated battle management aids for data fusion, combat identification, and engagement management;
- Near and far term technologies that counter air, cruise, and ballistic missiles and asymmetric threats;
- Force multiplication enhancements that benefit from interoperability (planned and unplanned);
- C4I and training opportunities with service, joint and coalition partners, and their civilian Homeland Defense (HD) counterparts;
- Integration of engagement capabilities and information management systems across the combined (DoD and HD) services;
- Integrated Fire Control – Counter Air (IFC-CA) kill chains that utilize multi-mission sensors and weapons platforms;
- Contributions to the Joint Integrated Air and Missile Defense (JIAMD) Roadmap; and
- Joint integrated fire control events and demonstrations: planning, results, and field tests.

TOPIC 11: EXERCISES & OPERATIONAL LESSONS LEARNED

Lessons learned from operational employment, exercises, wargames, test, evaluation, and training activities of our fire control systems, platforms, and processes are crucial to enhancing our warfighter’s capabilities. Recent tactical fire control events in overseas operations highlight the importance of constant refinement of our systems and processes. Warfighter discussions of lessons learned from these operational experiences provide invaluable insight for weapon control engineers, scientists, researchers, and product developers. Equally valuable, and of key interest to this national fire control community, are significant exercises, experiments, and wargames that provide realistic venues to evaluate hardware, software, tactics, techniques, procedures, and concepts of operation. Assessments and insights gained from these and other test venues are crucial to the future of fire control. We must learn from “on-the-fly” and “in-the-field” adaptations, as well as focusing on new technologies and capabilities to facilitate rapid development, and change in conjunction with these current and emerging capabilities. Submissions supporting all topics in this area are encouraged.

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TOPIC 12: FIRE CONTROL PLATFORM CAPABILITIES

Fire control performance is generally dependent on a set of sub-systems integrated into an air, space, or surface platform. This topic focuses on the fire control solution from the platform perspective. Discussion of a platform's impact on the 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 contested environments. Other areas included in this topic are:

- System performance predictions;
- Live fire test results;
- Lessons learned on weapon, sensor, platform integration issues (interoperability);
- Platform fire control tactics, techniques, and procedures;
- Planned platform fire control upgrades; and
- Multi-platform fire control solutions.

TOPIC 13: 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 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 chain/kill web. This topic will address:

- Current issues;
- Sensor, weapon and platform netting to integrate lethal and non-lethal effects;
- Assured Command and Control (C2)/Battle management across multiple command areas of responsibility;
- Agile communications and resilient network control of manned/unmanned platforms;
- Multi-domain fusion and integration (real and non-real time);
- 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 and sensor coordination.

TOPIC 14: 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; and
- Modeling and simulation that address the cyber threat (analysis, effects, etc.).

TECHNICAL TOPICS

TOPIC 15: MULTI-DOMAIN COMMAND & CONTROL AND INTELLIGENCE, SURVEILLANCE & RECONNAISSANCE

Multi-Domain 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 rapidly orient to evolving threats, and associated effective tasking, collection, processing, exploitation, dissemination, and management of the extensive and diverse set of data sources. These core capabilities and mission needs are imperative to provide warfighters with high velocity, decision quality and actionable combat data at the tactical edge. Abstracts are sought for current and proposed systems and technologies that solve 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. 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;
- 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 16: 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 17: SENSOR RESOURCE MANAGEMENT/SENSOR & DATA FUSION

As our fire control systems become more complicated depending on 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;
- Infrared/electro-optical;

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- 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 18: THEATRE & HOMELAND JOINT INTEGRATED AIR & MISSILE DEFENSE

Theatre and Homeland Joint Integrated Air and 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 19: SUBSURFACE WARFARE

Undersea warfare continues to be an increasingly complex operational environment for defensive and offensive military operations. Underwater situational awareness is critical for military advantage. New concepts for distributed underwater sensors and coordination are being developed. Other contributors to this complex environment include technological advances such as unmanned underwater vehicles. 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;
- Mine warfare;
- Undersea weapons selection and coordination;
- Undersea situational awareness;

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- Undersea unmanned vehicles;
- Targeting undersea threats;
- Targeting above surface threats from under the sea;
- The rapid exchange of data across the sea-air interface;
- Tunnel and buried target data fusion, sensors, and sensor management; and
- Targeting buried objects.

TOPIC 20: 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 21: 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 22: 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 and within Fire Control;
- Next generation weapon systems development (such as electric weapons, lasers, etc.); and
- Integration of new weapon systems.

**ABSTRACTS & OUTLINES
DUE: 6 SEPTEMBER 2017**

We look forward to receiving your abstract(s) for the 2018 National Fire Control Symposium. This event is restricted and 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 REQUIREMENTS

- 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, "Sharpening the Spear - Strengthening the Warfighter".
- Abstracts should be no more than 400 words long.
- Abstracts must contain an unclassified outline containing the key points of your presentation (this does not count against the 400 word count).
- Abstracts should include the title of your abstract in the body of the submission (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.

ABSTRACT SUBMISSION

ABSTRACT SUBMISSION

Note: Due to the conference location and senior flag level participation we are expecting an exceptionally high number of submissions for the 25th NFC. Presentations that will have content (oral or written) beyond the unclassified level, that are clearly associated with the proposed topic area(s), and are relevant to the Warfighter needs will have the highest probability of selection. You will have the opportunity to indicate the projected classification level of your presentation on the submission form.

NOTIFICATION & PRESENTATION INFORMATION

In early October 2017, you will be contacted regarding the status of your acceptance. 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 a session presentation at the last minute. Poster presentations are an important facet of the NFC and provide for dedicated one-on-one exchanges between the presenter and the attendees. Poster awards are given in recognition of quality content. This year posters will be located in a dedicated room, adjoining the technical sessions. The session chairs will draw the attention of the attendees to the available posters relevant to their session.)

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. Final presentations will be due 5 January 2018. Please note that selection and presentation of an abstract, whether oral or poster, does not waive any applicable registration fees. Oral presentations are limited to 20 minutes and this includes time for questions. We typically recommend presenters plan for 17 minutes for the presentation, 2 minutes of questions, and 1 minute for transition on and off the stage. For questions, please contact Ms. Michelle Williams, mkw@blue52productions.com, 937-554-4632.

**TO SUBMIT YOUR ABSTRACT, VISIT
[HTTPS://WWW.USASYMPOSIUM.COM/NFCS/CFA.PHP](https://www.usasymposium.com/nfcs/cfa.php)**