

2018

annual REPORT



Joint Air Power Competence Centre

www.japcc.org

**Joint Air Power
Competence Centre**

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Release

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foreword

Our defensive Alliance of 29 nations is the most powerful in human history. Despite this, NATO faces a threatening, unpredictable and opaque security environment that affects us beyond the borders of the North-Atlantic Area.

In an unpredictable world, with a wide range of challenges and opportunities, NATO is determined to protect and defend our indivisible security, our freedom and our common values.

At the 2018 Brussels Summit, and in other forums, our nations decided to continue to ensure that NATO has the full range of capabilities and forces that are trained, interoperable and deployable.

With respect to the nature and extent of our engagement we can say that the number of activities in which we are engaged has increased, and Allies continue to make valuable force and capability contributions that benefit the security of the Euro-Atlantic area through NATO's operations.

It is in this context that the JAPCC has stepped into the gap of the identified capability shortfall areas to provide assistance across a wide range of air and space power challenges. The JAPCC acts as a catalyst for the improvement of NATO's air and space power by providing insightful ideas and effective solutions to the Alliance.

As we have in the past, the JAPCC continues to work at the forefront of major technological issues facing NATO, demonstrated by one of this year's projects 'Future Battlefield Rotorcraft Capability Anno 2035 and Beyond'. This project provides an independent analysis regarding the necessary requirements for a future military-rotorcraft capability in support of future NATO rotary wing operations in 2035 and beyond.

Another outstanding example for JAPCC's value to NATO was the development of a new, and more comprehensive set of metrics to encompass all required operational and enabling components of Joint Air

Power capabilities. In July 2018, the Defence Planning and Policy Committee endorsed the Military Committee's advice to include these new Air Level of Effort metrics in the Political Guidance 2019, once again demonstrating the value of JAPCC advice to key decision-makers of our Alliance.

In addition, the JAPCC continued to provide Air & Space power expertise to several NATO Command-level exercises. JAPCC's role during these exercises is to provide highly dynamic and realistic Opposing Forces (OPFOR) Air, Space and Cyber-space interaction. Our specialists' involvement brings a depth of knowledge and responsiveness that would otherwise be missing. This support heightens the training audiences' interaction with the exercise itself providing a challenging and realistic environment in which to learn.

JAPCC's 2019 Programme of Work continues to focus on supporting the evolution and transformation of Allied Joint Air and Space capabilities with an eye always towards increasing interoperability. Key areas of effort in the coming year include: Space, Air and Missile Defence, Air Command and Control, Electronic Warfare, Joint ISR, Force Protection, Unmanned and Rotary Wing capabilities, and more.

Over the following pages, this JAPCC Annual Report will highlight the key developments, projects and research that shaped Joint Air and Space Power in 2018 and which will continue to do so in the future. I encourage each of you to take a few minutes to review this document, and to contact us with questions, feedback or requests for support at any time.

Good Reading!



Tod D. Wolters
General, USA AF
Director, JAPCC

who we are

Established in 2005, the JAPCC was the first NATO-accredited Centre of Excellence (CoE). We provide subject matter expertise across a broad range of Joint Air & Space (A&S) Power topics including the development of Concepts and Doctrine, Capability Development, Education and Training, and Lessons Learned in accordance with NATO MC (M) 236.

The JAPCC seeks to maximize its contribution to the improvement and transformation of Joint A&S Power through a well-formulated engagement strategy. This strategy not only guides the Centre's approach to organisations within NATO and our Sponsoring Nations, but also enables outreach to other national organisations and academia, allowing the CoE to tap into a comprehensive and diverse pool of Joint A&S Power subject matter experts.

Director's Vision

To be NATO's catalyst for the improvement and transformation of Joint A&S Power, delivering effective solutions through independent thought and analysis.

Mission

The JAPCC, as a team of multinational experts, is to provide key decision-makers effective solutions on A&S Power challenges, in order to safeguard NATO and the Nations' interests.

Leadership

The JAPCC is headed by the Director, General Tod D. Wolters (USA AF), who has led the centre since 1 July 2016. General Wolters also serves as the Commander, Allied Air Command and the Commander, United States Air Forces in Europe and Air Forces in Africa (USAFE-AFAFRICA) at Ramstein Air Base.

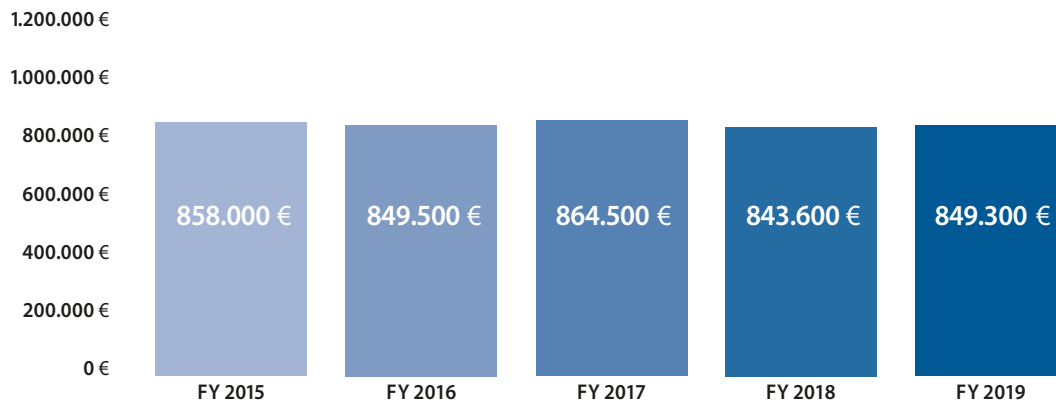
The JAPCC's Executive Director, Lieutenant General Klaus Habersetzer (DEU AF), also commands the



Director (USA AF)
General Tod D. Wolters



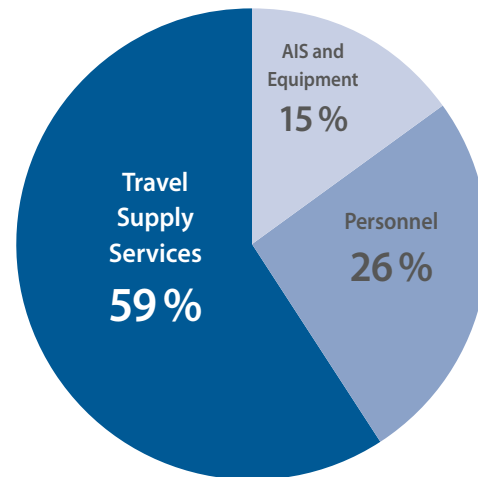
Executive Director (DEU AF)
Lieutenant General Klaus Heinrich Habersetzer



Approved JAPCC Budgets

German Air Operations Command and the German Joint Force Air Component as well as Combined Air Operations Centre Uedem.

On-site, Brigadier General Giuseppe Sgamba (ITA AF) serves as the Assistant Director (AD), and together with the Chief of Staff, Colonel Brad Bredenkamp (USA AF), provides day-to-day leadership for the JAPCC team.



JAPCC Budget Spending in FY 2018



Assistant Director (ITA AF)
Brigadier General Giuseppe Sgamba



Chief of Staff (USA AF)
Colonel Brad A. Bredenkamp

Colonel Andreas Unkelbach (DEU AF) is Branch Head Assessment, Coordination and Engagement (ACE) and Colonel Joseph Speed (USA AF) is Branch Head Combat Air (CA). Colonel Marco Galgani (ITA AF) is the Branch Head C4ISR+S, and Colonel Ben van Daatselaar (NLD AF) is the Branch Head Air Operation Support (AOS).

Personnel

The JAPCC has lost capability and capacity due to decreasing manpower over the past years. This trend has stopped and the numbers stabilized in 2018, with JAPCC ending the year with an overall manning of 65 percent, but a Subject Matter Expert (SME) manning of only 59 percent.

The JAPCC continues to actively mitigate these shortfalls through cross-utilization, internal education and training as well as creative technological solutions. However, in order to better address the spectrum of air and space subject matter areas relevant to NATO, and to better support the Joint Warfare Centre and major NATO exercise programs, JAPCC needs Sponsoring Nations to consider increasing their participation, and needs other NATO nations who may be benefitting from the Centre's work to consider joining.

Budgeting and Finance

Based on the JAPCC Medium Term Finance Plan and taking into account of the actual number of assigned staff officers, the JAPCC Budget for 2018 remained just below 850,000 Euros. Our Senior Resource Committee (SRC) continues to provide full support to our budget on the basis of 'minimum military-requirements'. As described in the JAPCC Operational Memorandum of Understanding, the sponsoring nations contribute to the budget according to the number of staff officers in their bid. The current corresponding annual cost per staff officer is approximately 14,800 Euros. For Fiscal Year 2018, the approved budget of 843,600 Euros was expended primarily on travel, supplies and services (59%), personnel related expenditures (26%) and replacement of furniture, as well as hard- and software upgrades for automated information systems (15%).

Stakeholders

Our primary customers are NATO Headquarters (Allied Command Operations, Allied Command Transformation, NATO Joint Commands and Air Command) and sponsoring nations. However, the JAPCC also accepts Requests for Support (RfS) from other sources via our RfS form, which can be accessed through the JAPCC website. With numerous successful products and ever-increasing connections with industry and academia, the JAPCC continues to build



upon its reputation as NATO's pre-eminent advocate for the development and enhancement of Joint Air and Space Power.

The JAPCC Provides Solutions to Address Air & Space Power Challenges

To fulfil our mission, the JAPCC conducts its own research and advocacy as well as responding to the needs of NATO and its member nations. Our Programme of Work (PoW) comprises Projects, Activi-

ties, and Tasks, which are dynamic in nature and are adjusted monthly based upon the acceptance of Requests for Support (RfS). Independently, the JAPCC also hosts a number of major events, including an Annual Joint A&S Power Conference, the bi-annual meeting of the Air Operations Working Group (AOWG), the Maritime Air Coordination Conference (MACC), one session of the biannual meeting of Air-to-Air Refuelling WG, the JAPCC Steering Committee (SC) meeting and the Senior Resource Committee (SRC) meeting.



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key developments

The JAPCC is vigorously active in areas in which it has SMEs available. This section summarises the efforts the organisation has made in the past year in support of NATO's Joint Air and Space Power; however, due to space constraints, these are top-level summaries of activity. For more detail on any specific area, please visit our website or contact us directly.

Joint Air Power Development

The JAPCC's support to Joint Air Power development in 2018 includes the following:

New Metrics for Air Level of Effort. Closely related to the development of the new Joint Air Power Strategy (JAPS), ACT was tasked to develop a new definition of Air Level of Effort (Air LoE). Political Guidance 2015 (PG15) used Expeditionary air force Elements, in terms of the ability to generate sorties per day (to express the Air LoE) in multi-domain NATO operations. JAPCC was tasked to develop a better set of metrics to encompass all missing JAP capabilities to include but not limited to e.g. Surface Based Air and Missile Defence, Air Component infrastructure, Air Command and Control capabilities, Air Controlled and Unmanned Aerial Systems etc. The study results were validated against the 14 agreed NATO operational scenarios used in the NATO Defence Planning Process. In early February 2018, the final results were presented to a senior level Military Judgement Panel prior to IMS/IS staffing for endorsement by the Military Committee (MC). On July 1st, the Defence Planning and Policy Committee (Reinforced) endorsed the MC's advice to include the new JAPCC Air Level of Effort metrics in PG 19.

The Rotary Wing Focus Group (RWFG). The JAPCC / RWFG is to increase awareness and coordination among the assigned Rotary Wing SMEs and their branch heads, in order to improve the quality of their work through a well-defined working method.

Today the RWFG counts six JAPCC SMEs with varying backgrounds from four different nations, split between

the Air Operation Support and Combat Air branches within the JAPCC.

The RWFG also reaches out to other experts, within the JAPCC, the Allied Air Command, Combined Air Operations Command Uedem and the German Air Operations (ZLO) Command Kalkar, in order to support the development of specific projects or the organization of specific events. Due to the inherent process of consensus making, this working method significantly increases JAPCC credibility within the larger community of helicopter users.

Examples of projects and objectives to be managed by the RWFG are studies and white papers regarding: future rotorcraft in support of the Next Generation Rotorcraft Capability Team of Experts (NGRC ToE), development and maintenance of NATO standardisation, as well as, improvement of interoperability of helicopter operations doctrines in cooperation with the NATO Helicopter Inter service Working Group (HIS WG).

Support to Studies of the NATO Army Armament Group / Joint Capability Group Vertical Lift (NAAG / JCGVL), 'LAMP Reference: VL-001'. The JAPCC has liaison with the JCGVL, which meets twice each year. The JAPCC also had the vice-chairmanship of the study group NGRC ToE. The ToE performed a study to identify a Next Generation Rotorcraft Capability for 2035 and beyond. The final report was submitted for approval in Sep 2018 to the JCGVL, and is scheduled to be discussed in a special meeting of the NAAG. The JCGVL will discuss different Long Term studies in which the outcome of the NGRC ToE can be used.

Fifth Generation Integration Efforts in the European AOR. Integrating fifth generation systems into existing allied forces has been an effort for many years. As the F-35 is now in the European theatre, the effort has been increasing, with much of the 'shared' work primarily being led by three organisations, with significant participation of partner groups, including the JAPCC. The overarching aim of the integration effort(s)



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is to smoothly incorporate new capability inherent in fifth generation platforms into existing fourth (and older) generation systems, enabling fifth generation platforms to truly become a force multiplier. In 2018, the JAPCC participated in the following (ongoing) 5th generation integration efforts:

- **European Air Group (EAG).** The EAG's Combined Air Interoperability Program (CAIP) began in 2016 as a task from the EAG Steering Group. The aim of the CAIP is 'to resolve the issues that result from integrating 4th and 5th generation weapons systems, in order to achieve a higher level of interoperability in future combined air operations'. The CAIP lists 16 'challenges', placed in four subject areas: General, Air Operations, Air Enablers, and Air Command and Control.

The JAPCC was heavily involved in EAG's CAIP. The JAPCC took the lead of multiple CAIP challenges in-

cluding 5th Generation Doctrine development and ROE/National Caveat Management development. Additionally, the JAPCC is supporting many other 'challenges' through participation in two CAIP workshops and provided assistance with focus areas currently under investigation. The JAPCC Combat Air Branch Head also participates in the CAIP management board.

- **Allied Air Command (AIRCOM).** AIRCOM is the NATO lead for fifth-generation integration and maintains the operational perspective, along with advising SACEUR on strategic matters. In November 2016, AIRCOM published a Study Paper entitled Modern Aircraft Integration (MAI) which provided initial analysis of actions to be taken for effective MAI in AIRCOM's area of responsibility. AIRCOM maintains an active 'AIRCOM Work Plan' that addresses items such as Air Policing, AirC2, and Training and Exercises and it also includes plans for recurring workshops.

The JAPCC is newly involved in AIRCOM's MAI Work Plan, and the lines of effort have synergistic effects with the EAG's CAIP. The JAPCC's participation is primarily through taking the lead of Caveat Management development and potential legal considerations with 5th generation capabilities in terms of Positive Identification (PID) and Rules of Engagement (ROE).

Contribute Joint A&S expertise to Alliance decision-making processes through active leadership of and participation in NATO committees, Working Groups and fora.

- **U.S. Air Forces in Europe (USAFE).** The USAFE A3I (i.e. Operations Integration) branch was formed in December 2017. The A3I team serves as the secretariat of the 'European F-35 Users Group' consisting of a General Officer Steering Group (GOSG) and an OF-5 Working Group. The GOSG, with representatives from each European nation that is procuring the F-35 (including non-NATO nations), meets annually. The Users Group Working Group (UGWG) meets twice a year. The group focusses on common areas of concern throughout the F-35 nations.

The JAPCC's participation is primarily through participation in USAFE's F-35 Working Group. Though much of the information presented is non-releasable to NATO, writ large, the Users Group provides unique insight into the beddown and national level integration of the F-35. This level of access is proving key to understanding where the true friction points for F-35 integration likely lie. The JAPCC SMEs are also working with national representatives in the F-35 community to enhance 5th generation awareness and education by acquiring and disseminating releasable documents to the Alliance.

NATO Command Structure (NCS) Force Protection Advisory Group (FPAG). The JAPCC supports the NATO Force Protection Advisory Group (FPAG)¹, an organisation that is optimised to provide the correct FP advice, at the correct time, at the correct level² and in

the most effective form. The FPAG has up to five dedicated meetings per year, of which all but one are conducted by means of Video Tele-Conference (VTC). FPAG face-to-face meetings are held annually at the JAPCC with the last held over the period 27 – 29 November 2018. Given the JAPCC's span of FP and FP-related activities and whilst not a permanent member of the FPAG (being outside the NCS and NFS), the JAPCC not only provides a significant contribution to the FPAG agenda, but is central to the delivery of many of the FPAG's aspirations e.g. improved NATO FP publications and enhanced training. Furthermore, challenges discussed within the FPAG normally result in SHAPE being tasked, as the FP Requirements Authority, to take the lead in developing a response. If no coherent approach to the challenge exists, it is often the JAPCC that is subsequently asked by SHAPE (by means of a Request for Support (RfS)), to provide a start-point by means of a discussion paper or think-piece. This approach to NATO FP challenges has become well-established practice over recent years with JAPCC FP being asked twice by means of RfS in 2018 to consider the implications for FP Practitioners of countering adversary use of unmanned systems and the implications for NATO of the outsourcing of FP capability (think-pieces).

NATO Military Committee Joint Standardisation Board (MCJSB), Force Protection Working Group (FPWG). As a NATO COE, the JAPCC is well placed to support the work of the FPWG. The primary means of delivery of this support is through the provision of the position of Chair for the Doctrine Organisation and Interoperability (DOI) Panel of the FPWG by the JAPCC. The DOI Panel is the body that delivers, on behalf of the FPWG³, FP publications as well as recommendations for the organisation of FP in NATO; this, in turn, is designed to deliver increased interoperability or at the very least, 'Operational Compatibility'. The JAPCC, whilst focussing on the DOI sphere, has also been engaged by the FPWG (through SHAPE) to deliver papers in response to RfS, that address current, real-world challenges confronting the Alliance.

Development of NATO Advanced FP (Practitioners) Course. In May 2015 the FPWG articulated a need for a NATO Advanced FP Course and the JAPCC, as the OPR for the existing course was asked to explore both the

Training Need and the likely course content. This activity took a protracted period of time as there was a considerable spectrum of need together with a variety of opinions within the FPAG which in turn resulted in a spectrum of content that was simply undeliverable. The JAPCC developed a compromise proposal that met a substantial proportion of the identified need across a significant percentage of the likely training audience (i.e. an 85%+ solution). The proposal developed can be delivered in five days and is envisaged as a follow-on to the existing FP course. The JAPCC proposal was presented to and endorsed by the FPWG (Nations) on 18 October 2017 and subsequently endorsed after some discussion by the FPAG (NCS/NFS) on 23 November 2017. This then resulted in a proposal presented to the NATO School Oberammergau (NSO) over the period 11 – 13 December 2017. Following agreement on the way ahead, the JAPCC delivered the underpinning Course Control Documents (CCDs) to the NSO over the period 1 February – 24 June 2018 and agreed upon a delivery mechanism and timescale for a future Pilot Course. This Pilot Course will be presented over the period 3 – 7 June 2019. The primary Training Audience is military or civilian personnel in, or identified to fill, specialist FP staff positions, primarily at the Operational level, in national or NATO establishments. The advanced course will be classified up to NATO Secret and the NSO will allocate facilities accordingly. The overall aim of the course will be to better prepare personnel to assume specialist Force Protection staff or Force Protection related staff appointments in national or NATO Headquarters. The content of the course will focus on but, will not be specifically limited to, providing an overview of FP within the NATO Planning Process, FP input to the Force Generation Process, the FP Estimate, the Crisis Urgent Operations Requirements (CUR) Process, and the Force Protection Advisory Team (FPAT) Concept.

Alliance Future Surveillance and Control Project (AFSC). The NATO AWACS fleet is scheduled to retire from service in or around 2035. Consequently, the North Atlantic Council tasked the Conference of National Armaments Directors (CNAD), to determine requirements and advice on options and possible ways to deliver a follow-on to the AWACS capability under the heading of the Alliance Future Surveillance and Control initiative, or AFSC.

At the 2016 NATO-Warsaw Summit, the North Atlantic Council approved the AFSC Pre-Concept Stage report and Heads of State and Government declared: 'By 2035, the Alliance needs to have a follow-on capability to the E-3 AWACS. Based on high-level military requirements, we have decided to collectively start the process of defining options for future NATO surveillance and control capabilities.'

Based upon the NAC's direction and within the boundaries of the approved AFSC Concept Stage model, the Concept Stage will be conducted in three Phases:

- Phase 1 – Development of refined capability requirements and deliverance of AFSC capability architectures capturing alternative operational concepts. Furthermore, conduct of knowledge gap analysis in order to identify study objectives to inform Phase 2;
- Phase 2 – studies of selected AFSC High-Level Technical Concepts by capability architectures and related project architectures including down-selection of the preferred AFSC capability architecture and project architectures for which materiel solutions have to be procured in Phase 3;
- Phase 3 – development of programmatic arrangements necessary to initiate procurement programme(s) at the conclusion of the Concept Stage.

Throughout the Concept Stage, each Phase will end with a decision point where Allies will have the opportunity to examine the deliverables and provide direction and guidance to the NSPA (AFSC Host Nation) on how best to proceed.

In order to govern and manage this effort, an AFSC Support Partnership Committee (SPC) and AFSC Project Office has been established.

The Concept Stage started in January 2017 and is expected to be concluded in the last quarter of 2022.

HQ-SACT requested the support of JAPCC to contribute to the AFSC Program Office venues i.e. multiple Workshops on Requirement development, Requirement review and Gap Analysis. Finally, writing support

to Phase 1 program report and Phase 2 Framework plan has been provided.

Support to COE CSW Study on Integration of Unmanned Systems into Maritime Operations. Allied Maritime Command (MARCOM), NATO Maritime Air Command (MARAIR) Plans & Policy initially requested the Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) to conduct a study on the integration of Unmanned Aircraft Systems (UAS) into maritime operations. Due to lack of available expertise, CJOS COE had to decline this request. The Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW) assumed responsibility for this project and requested JAPCC support. After initial research COE CSW and JAPCC briefed MARCOM MARAIR on the first findings, pointing out that focusing only on the air domain will not be sufficient in the maritime environment. MARCOM MARAIR agreed to expand the scope of the project to include all maritime domains, i.e. surface, sub-surface, air, and ground, and to address all unmanned systems within these domains. The project title has therefore been changed to 'Integration of Unmanned Systems into Maritime Operations'. Of note, the project was briefed at the 2018 Maritime Air Coordination Conference to the maritime community of NATO. The project team is currently looking into the capabilities of unmanned system payloads in all the different domains and mapping them to the maritime warfare areas. In a next step, the interoperability of the unnamed systems and their cross-domain opportunities will be analysed to develop potential future concept of operations. Due to the project's expanded scope a first draft is expected by the end of the third quarter in 2019.

Close Air Support Project. The aim of this project is to provide recommendations on how the CAS and Joint Terminal Attack Controller (JTAC) communities should adapt and leverage emerging capabilities to meet future operational requirements in the long term (defined for this study as 10-15 years). The JAPCC plans to publish this study in the first half of 2019.

Support to Fit for Confined and Shallow Waters (CSW) Project – Smart Defence Project 1.44. JAPCC support with Air expertise this project led by the CSW

CoE from Kiel. The feasibility study is conducted to investigate the possibility of developing and operating a set of compatible components, thus enabling nations to maintain a broad(er) set of affordable and effective capabilities for maritime, combined, and potentially also joint operations, especially designed for the comprehensive and challenging scenarios in CSW. The study should investigate and define, from a holistic approach, possibilities and requirements for a variety of systems which are capable of being deployed from a variety of multinational platforms and shore installations available. The outcome should be used for follow on investment, development and procurement planning.

Support of NATO STO Study SCI-301 Defeat of Low Slow and Small (LSS) Air Threats. JAPCC is contributing to a three-year study headed by the NATO Science and Technology Office on the future of Counter UAS systems which is. While conventional threats remain of concern, deployment of Unmanned Air Systems (UAS) has provided one of the most significant military capability enhancements of recent years. Challenges posed by UAS are many and range across the complete kill chain. Traditional systems and first-generation Counter UAS systems may be unable to cope with this challenge in the future. The Goal of the study and its final report in 2020 will be to provide recommendations to support a 'Second Generation' C-UAS networked system.

Contribution to the STO SCI-311 Research Task Group – Collaborative Space Domain Awareness Data Collection and Fusion Experiment. A JAPCC member is involved in this two-year long STO project as an active contributor. Today, space-related data and products from different NATO nations include variations in data protocols and sensor attributes. However, to ensure the timely and effective exploitation of those data and products, a common integrated environment within NATO planning and operations domains is required. In particular, combined effort based on effective collaboration strategies can considerably improve NATO Space Situational Awareness by providing greater geometric diversity, enhanced observability of space objects, and timeliness of reporting. The aim of this project is to experiment on the benefits of collaborative Space Domain Awareness (SDA) data collection and mutual exchange among NATO nations. It involves



personnel and hardware/software resources from seven NATO countries: Germany, Italy, Poland, Romania, Spain, the UK and the US. The final report on this experimental activity is expected to be delivered in 2020.

Command and Control of a Space Surveillance and Tracking (SST) Network. This is a continuing project from 2016. Based on a Request for Support from the Italian Air Force Staff, this project aims at analysing and defining the best solution for a C2 model for a multinational SST network. This project will also emphasise the advantages of an EU SST network for the Alliance and promote the importance of Space Situational Awareness and SST in support of NATO military operations. The relevant white paper is expected to be published early in 2019.

Cyber. JAPCC continued engagement in strengthening NATO's Cyberspace defence posture through contributing expertise to policy development/review research and analysis and exercise support. The key to success remains raising our collective understanding of Cyberspace and level of preparedness, particularly as it pertains to the projection of Joint Air Power. The main efforts focus on supporting the Cyber Defence Action Plan and raising awareness

among staff, operational personnel and senior leadership/decision-makers.

The third iteration of NATO Allied Joint Doctrine for Cyberspace Operations Doctrine, AJP-3.20 (Draft) was distributed in 2018 and is currently being reviewed by member nations. Drafted in January 2016, the custodian (Cooperative Cyber Defence COE) expects to achieve concurrence sometime in 2019. JAPCC continues to assist in the evolution of Doctrine and Policy by providing expertise to ACO which leads policy development and management and monitoring progress through the Cyber Road Map. On 12 June 2018 the North Atlantic Council approved the Military Committee's Vision and Strategy on Cyberspace as a Domain of Operations in which numerous recommendations from the 2017 JAPCC White Paper, such as integration of Cyberspace into established operational processes and incorporating sovereign Cyberspace effects voluntarily by Allies, have been included.

JAPCC researched and published a report on Cyber-Enabled Information Warfare (C-IW) highlighting Cyberspace as a significant force multiplier for Information Warfare and Hybrid operations conducted below the threshold of Article 4 and 5 levels of conflict. The article



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explained how C-IW has been used successfully to unlawfully seize and hold territory and that it continues to pose an existential threat to many nations. Solutions for consideration were proposed for how NATO could prepare to address this threat now and for the foreseeable future. JAPCC provided a Cyberspace SME as OPFOR Cyber for the scenario development, incident scripting and the execution phases of Exercise Trident Juncture 2018 in order to provide a realistic, challenging Cyberspace campaign for exercise participants.

Space Support to NATO Operations. The JAPCC continued to champion the evolution of Space Power within NATO, mainly through its participation in the Bi-Strategic Command Space Working Group (NBISCSWG), which reports directly to the NATO Military Committee (MC) and which is committed to the evolution of space support for alliance military operations. Since June 2016, the NBISCSWG has a new mandate, 'NATO's approach to space – follow-on work'. In the frame of

this new mandate, the JAPCC contributed to the production of a 'Framework for a NATO Policy for Space Support in Operations'. This led, on 18 May 2018, to the publication of MC 0670 'Policy on Space Support in NATO Operations'. The next step towards a better integration of Space in NATO deterrence and defence posture will be an overarching NATO space policy, as announced during the Brussels Summit in July 2018.

Doctrine, Standards, and Procedures

Over the last year, the JAPCC led and participated in the following doctrine efforts:

Custodianship of MC-0656, Military Committee (MC) Policy for Force Protection of Alliance Forces.

This document was finally promulgated on 24 January 2018 and represented the end of seven years of JAPCC work to deliver a NATO Capstone Document for Force Protection (FP). The purpose of the Policy is to create a

common, agreed understanding of the subject as well as allocate responsibility for the provision of FP across the spectrum of conflict, irrespective of whether that conflict is within or external to NATO borders. Having an overarching Policy in place considerably simplifies the current review of AJP-3.14, Allied Joint Doctrine for Force Protection. FP as described in Policy is a complex area that requires the activity of many 'cross-cutting domains' (to include Security and Defence Against Terrorism (DAT)) to be co-ordinated. As a result, the JAPCC is engaged with other stakeholders to review both Security Policy and then subsequently the Alliances' Defence Against Terrorism Concept. The eventual goal is a single NATO Protection Policy that brings together in a coherent manner, many associated but currently uncoordinated disciplines. A single approach will eliminate gaps that could be exploited by any adversary and make the delivery of Force Protection far more resource efficient.

Custodianship of AJP-3.14. The Allied Joint Doctrine for Force Protection is currently being reviewed. A Request for Feedback (RFF), drafted by the JAPCC Custodian, was posted on the Allied Joint Operations Doctrine Working Group (AJODWG) Forum on 20 December 2017. The Data Fusion Workshop (DFW) took place over the period 16 – 20 April 2018 hosted by the UK's Defence Concepts and Doctrine Centre (DCDC), at Shrivenham. At this event the document's JAPCC Custodian acted as the Secretary. Immediately after the DFW on 19 April 2019, the JAPCC submitted to the Allied Command Transformation (ACT) Doctrine Coherence Branch an Adjudicated Comments Matrix, a Report on the Conduct of the DFW and a draft proposed Doctrine Task. At the time of writing, no output from the DFW has been provided to the AJODWG by ACT. However, as agreed during the DFW, the JAPCC hosted a Writing Team Meeting over the period 25 – 27 September 2018 which has incorporated approximately 50% of the adjudicated comments into a revised draft of the AJP. A second Writing Team Meeting has been scheduled for 1 – 5 April 2019 with the intent of completing the development of a revised AJP for submission to the AJODWG by the third quarter of 2019.

Revision of C-M(2002)50. The first complete review of the document has been completed and a new structure for the revised document has been agreed upon. The

next phase of this work in 2019 is to place the fully revised text onto the new structure and circulate for comment to the wider FP community. The development of this document remains a substantial project that will eventually lead to a document that, whilst retaining the same reference, will have both a new title and new content. This is seen as a three to five-year project.

Authorship and Custodianship of ATP-3.3.6. The majority of this publication was produced in the 2009/10 timeframe and was offered to the nations at this point for ratification. However, the overarching AJP was in the process of a protracted review and the nations stated their intent to wait until the AJP was ratified before endorsing the ATP. The ATP was eventually promulgated on 08 April 2016 and as a result, should enter an in-cycle review during the first quarter of 2019. In order to simplify the review process, the JAPCC maintains a 'working copy' of the document into which corrections and new ideas/concepts are incorporated at the time they are identified. These concepts are briefed bi-annually by means of a Custodians Report to the Air Operations Working Group (AOWG). The last Custodians Report submitted to the AOWG on 27 September 2018 identified five significant areas where the Nations and/or the NATO Air FP Community saw a need for addition and/or improvement. These areas are:

- The introduction of the concept of a Complex Air Ground Environment (CAGE).
- More detail (a potential separate Annex) on the conduct and integration of Counter-Surface to Air Fire (C-SAFIRE) activity around an Airbase.
- More detail and possible exemplar of an Air Force Protection Command and Control (FPC2) construct.
- Provide greater fidelity of the relationship between FP and Cyber Defence.
- More discussion of how Air FP should counter the growing threat from Unmanned Systems (noting the potential for land-based or waterborne systems, not just air systems, to affect the effective and safe conduct of air operations).

Custodianship of AD 80-25. This Directive was originally developed to address the significant weaknesses identified in the original version of AJP-3.14, Allied Joint Doctrine for Force Protection. However, with the revision of AJP-3.14 in 2015, the AD 80 -25 ceased to

be fit-for-purpose and the Doctrine Organisation and Interoperability (DOI) Panel of the NATO Force Protection Working Group (FPWG) chaired by the JAPCC took responsibility for a review and subsequent rewrite. A final draft of the new document was passed to SHAPE by the JAPCC for staffing on 01 September 2017 and the new Directive was finally issued on 22 January 2018. This latest version retains the same title but is completely new in terms of content. The new Directive now fully complements the current suite of NATO FP Doctrine which provides the 'what' and the 'why', whilst the Directive now provides the 'how' for the FP practitioner at the operational level. The AD 80-25 remains the 'go-to' document for staff officers in NATO FP appointments.

Promote and showcase the effectiveness and relevance of Joint A&S Power as a critical element in Air, Land and Maritime operations.

AJP 3.3 Allied Joint Doctrine for Air and Space Operations. The JAPCC is the custodian of NATO's doctrine on joint air operations, AJP 3.3, Allied Joint Doctrine for Air and Space Operations. Edition B of AJP 3.3 was ratified and promulgated in 2016, partially updating the original version published in 2009. In 2017 a doctrine task was received by JAPCC to commence staff coordination on an update which will result in Edition C. (old version was dated 5 November 2009). Working Draft 1 was published in November 2017, and JAPCC received more than 800 comments in early 2018 in response to a request for feedback. These were adjudicated and Study Draft 1 was published in December 2018 with the goal to have AJP 3.3. 'Edition C' ratified by the second quarter of 2019.

NATO Joint Intelligence Working Group (JINTWG)

The JAPCC supported the writing team of Allied Intelligence Publication (AIntP) 16. This new doctrine on 'Intelligence Requirements Management & Collection Management (IRM&CM) Procedures' will provide the link between Joint Intelligence (AJP 2.1) and Joint ISR (AJP 2.7 and AIntP-14). Furthermore, the JAPCC contributed to diverse doctrine and standardization doc-

uments in the field of Imagery Intelligence (AJP 2.8, IMINT TTPs, RECCEXREP, etc.) and helped provide the joint perspective to the drafting of ATP-102 on Maritime ISR. Unfortunately in the second half of 2018 the JAPCC was unable to continue support to the JINTWG following the departure of the Intel, Research and Analysis SME. JAPCC expects this position to remain gapped until at least April 2019.

ATP 3.3.4.1 / 3 / 4 Custodianship. The new editions of these Air Transport doctrine publications were reviewed during the year and were ratified. The ATP 3.3.4.4 is now reopened and under discussion for a new version that will be ready by next year. As the JAPCC holds the NATO ATWG Chairmanship, it continues to manage the focus of the AT community. The JAPCC also continues to be a contact point for coordination between NATO and EU organizations involved with AT.

AJP 3.7 Allied Joint Doctrine for Recovery of Personnel in a Hostile Environment. JAPCC and the Rotary Wing Focus Group provided expertise and contribution for a future version of this doctrine in order to maximise interoperability across the Alliance. The Data Fusion workshop took place in December 2018.

ATP 3.3.4.2. The JAPCC remains active in the management of Air to Air Refuelling (AAR) Doctrine, Standards and Procedures. This year, a complete rewrite and reformatting of this ATP was accomplished bringing it into line with current and future Alliance operational procedures. In addition to continuing as the NATO AAR WG Chair, the JAPCC continued its management of the global AAR compatibility and clearance matrix and built upon its relationships with other key AAR stakeholders, producing, updating and disseminating standardized AAR documents (6 STAN-AGs / 4 NATO SRDs / 1 SRD template / 26 National and Organisational SRDs).

ATP-49 Custodianship. Within the Helicopter Inter-Service Working Group (HISWG), the Helicopter Operations Panel (HelOps Panel) is responsible for helicopter standardisation. In order to improve the interoperability of staff and operators, the HIS WG is tasked by the MC LSB to restructure the entire HIS standardisation portfolio (reference: NSO(ARMY)1239

(2918)HIS). The ATP-49 is being revised as ATP-3.2.49. This revised standard will consist of a top-level document supplemented with identified operational areas describing Tactics, Techniques and Procedures. In coordination with the chairman of the HelOps Panel, the JAPCC, as custodian of the ATP-49, is leading the revision task, which started in April 2018 and will be accomplished by mid-2020. The future ATP-3.2.49 custodianship will remain within the JAPCC.

Helicopter Underslung Load (USL) and Helicopter Underslung Load Equipment (HUSLE) Certification & Interoperability Data Base. On request of the HISWG, in close coordination with the HUSLE panel, the JAPCC is developing a 'Helicopter USL/HUSLE Certification & Interoperability Database'. The request is in accordance with the recommendations of the USL Certification study, published by the JAPCC in November 2017.

The database will provide NATO nations and partners an information and guidance tool regarding relevant helicopter USL and HUSLE aspects and procedures. It will be an extremely useful tool for planning safe and effective cross-national transport of USLs.

White Paper: Future Battlefield Rotorcraft Capability Anno 2035 and Beyond. JAPCC produced a white paper which provides an independent analysis regarding the necessary requirements of a future military-rotorcraft capability in support of future NATO rotary wings operations in 2035 and beyond. The white paper was released in November 2018.

Education/Training and Exercises/Evaluation (ETEE)

In 2018, the JAPCC was active in the following ETEE areas:

Support to Major NATO Exercises. In April, JAPCC supported AIRCOM during its annual Exercise **Ramstein Ambition 18**. JAPCC provided an OPFOR air team (including one SME from HUN AF) to Exercise Control (EXCON), which executed a highly dynamic air scenario for the training audience.

JAPCC was requested by the Joint Warfare Centre (JWC) for the 6th consecutive year to support both the



JAPCC FBRC White Paper, Released Nov 2018

development of the exercise scenario and the actual exercise planning and execution for Exercise **Trident Juncture 18**. Starting with the development of the Occasus exercise scenario, the JAPCC was heavily involved and was successful in supporting JWC and the exercise with relevant Air & Space Power subject matter expertise. In November, a combined JAPCC team deployed to Stavanger, Norway to support the Command Post Exercise Trident Juncture 18. JAPCC personnel were augmented by SMEs from CAOC Uedem, the German Air Operations Command and the Netherlands- and Hungarian Air Forces, all of whom deployed as members of the JAPCC team. The deployed JAPCC team, as part of the overall OPFOR concept, challenged the Training Audience with a host of modern warfare threats including a Major Joint Operation, Anti Access/Area Denial (A2AD), peer-to-peer adversaries, TBM- and Space operations and Cyberspace challenges. Over a ten-day period the small JAPCC-led OPFOR Air team was able to plan and execute almost 10,000 sorties.



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Component Integration Challenges Stemming from Advanced Layered Defence Systems (A2/AD).

In 2017 JAPCC drafted a presentation to educate each of the components about challenges which their partner components face in an A2/AD environment with a goal to facilitate improved coordination in the future. The secondary focus of this presentation was to articulate how the NATO exercise series failed to address these issues and offered solutions to improve the exercise program as well as training audience performance in this peer-to-peer competitor environment. The results of this education campaign were seen in changes to exercise scripting as well as senior-staff awareness of the joint nature of the problem, improving NATO's readiness to respond in this environment. In 2018, JAPCC continued to present this briefing at the request of

several NATO and National institutions, starting with an invitation to present during the Key Leader Training event for Trident Juncture 18 at Joint Force Command Naples. Furthermore, the presentation was provided at HQ MARCOM in Northwood, the Romanian Air Staff in Bucharest, the German Air Staff in Berlin, CAOC Torrejon, the NATO Tiger Meet and the Netherlands Defence Academy.

Air Transport Exercises. The JAPCC continued its cooperation with the European Tactical Airlift Centre. The AT SME is acting as a Flight Safety Manager in the tactical course and he contributes to the symposium as POC between NATO and EU Air Transport community. The JAPCC is following the development of the centre with the idea of acting as a focal point for future endorsement of the courses.

Air-to-Air Refuelling Training. This year also saw the continued use of the Standardised Heavy Air Refuelling Course, a course created by JAPCC and AIRCOM personnel to train JFAC AAR planners and practitioners, culminating in the graduation of more than 120 NATO certified multi-national tanker planners. In the beginning of the year, the AAR SMEs in conjunction with NATO HQ IS-DI, EDA, and the Royal Netherlands Flight Test Centre conducted the second annual two-day course focused on what it takes to obtain a cross-national AAR Clearance. This training was attended by 39 personnel from 16 nations representing 33 different organizations. The Table Top Exercise (TTE) was very well received and overwhelmingly requested to be a semi-annual event with the next iteration taking place in Dayton Ohio in February 2019 and an additional event expected to take place sometime in autumn 2019.

Support to Helicopter Air Advisor Training. As a result of NATO's Afghanistan operations shifting from ISAF to Operation Resolute Support (ORS), the Alliance has refocused various efforts from actual operations to the application and implementation of lessons learned, focusing on a battle rhythm of education, training, exercises and evaluation. Part of this follow-on effort is to train future ORS helicopter operators and maintainers on specific challenges they might encounter in Afghanistan. In support of this effort, a group of four Central-European nations (Croatia, the Czech Republic, Hungary and Slovakia) utilize their unique knowledge and experience in operating Russian-made helicopters. These four nations participate in the pre-deployment phase of the preparation of aircrews during a four-week training event which consists of a course in a simulation centre in Ostrava, Czech Republic and a live flying training series in Zadar, Croatia.

The JAPCC regularly participated in this training event by sending a helicopter SME with an operational background and expertise in military advising, who gave classes on different subject matter areas in order to enhance effectiveness and overall safety of the work of air advisors.

Air Force Protection (FP) Support to the European Air Group (EAG). The EAG is an ideal start-point for any work as it is often easier to achieve consensus amongst

the smaller group of seven participating nations. Equally, when presenting a project to the larger NATO group, it is of great benefit to be able to present from the perspective of already having seven (or more) nations already having reached agreement (or at least consensus). This year the following tasks were performed:

a. Support to the VOLCANEX. VOLCANEX is an annual Air FP Command Post Exercise (CPX) that is run by the UK's Royal Air Force (RAF) Regiment at their FP Centre at RAF Honington. This year's event took place over the period 30 April – 11 May 2018. At this event the role of the JAPCC was twofold. Firstly, to provide mentorship where necessary to senior positions within the multi-national FP Command and Control organisation. Second, to run a workshop parallel to the CPX that looked to capture lessons identified during the CPX in relation to a current topic of interest.

b. Think-pieces Force Protection. The concept of producing think-pieces has gained traction with Allied Command Transformation (ACT) as issues can be raised and discussed in order to promote debate but, without the need to necessarily provide solutions requiring consensus.

• 1 - The implications for NATO of the Outsourcing of FP Capability. On 5 December 2017, the JAPCC received two RfS from SHAPE J3 Support to Operations (SOPS) Division related to FP. The challenges captured in the RfS had both been previously briefed to the Nations at the FPWG of October 2017 and the SHAPE proposal to task the JAPCC with associated studies was endorsed by the Nations. The first and more urgent RfS was a request to capture in a short think-piece the potential challenges and obstacles to NATO of contracting FP capabilities for North / Kabul International Airport (N/KAIA), should there be no national military commitment through the Force Generation Process. In response to this request a detailed answer was provided to SHAPE on 5 April 2018. The nature of the subject resulted in an extremely limited circulation of the think-piece. The product delivered was stated by SHAPE as providing a comprehensive response to the question posed and remains a valid document as this problematic issue continues to stalk Operation RESOLUTE SUPPORT.

Furthermore, the response addresses the subject in a generic manner so that it can be applied not only to current operations but, also to potential future operations should the issue arise.

• **2 - The Implications for FP Practitioners of Countering Adversary Use of Unmanned Systems.**

This RfS requested the JAPCC explore the challenges of adversary use of Remotely Piloted Air System (RPAS) and the implication of such use for NATO FP. Early in the consideration of this subject it was identified that remotely operated systems exist in all domains and adversaries will not necessarily target NATO assets in their parent domain (e.g. an Airbase could be targeted by an adversary using a land-based remotely operated system). Therefore, the JAPCC product considers broader adversary use of Unmanned Systems. The initial product was briefed in detail at the NATO Senior Officers Air FP Seminar in May 2018 at Ramstein and the paper was subsequently used as a major part of the back-brief from the Seminar to the AIRCOM leadership. During the Seminar the JAPCC approach to the subject was seen as entirely appropriate and a number of entities beyond SHAPE expressed an interest in being involved in further development of the Think-Piece that underpinned the brief; this included Nations, NATO entities beyond SHAPE and the European Air Group (EAG). Given the specified SHAPE RfS timeline, the paper requested was delivered by the JAPCC to SHAPE on 21 June 2018. SHAPE subsequently notified the JAPCC on 16 July 2018 that the paper far exceeded SHAPE expectations and would be of substantial value in helping SHAPE develop appropriate mitigation strategies. The Think-Piece was subsequently circulated to those parties which expressed an interest in contributing and a final workshop to consolidate and validate inputs was hosted by the EAG over the period 6 – 7 December 2018. The intent remains to publish a second EAG/JAPCC Think-Piece during the first quarter of 2019.

• **3 - Force Protection Command and Control (FPC2).**

This think piece grew out of VOLCANEX/DOBEX 2016. The task to the JAPCC for this event was to attempt to capture how a multi-national FP organisation could be established and run. The original intent was to produce a paper for inclusion as an annex to the Post-

Exercise Report (PXR). However, the EAG Headquarters' and the individual nation's interest in the product was such that it has been developed into a 'stand-alone' joint EAG/JAPCC White Paper. This product was developed throughout 2016/17 through a series of workshops held either at RAF Honington or RAF High Wycombe involving all of the interested parties. The eventual White Paper, the first document produced as a collaboration between the EAG and the JAPCC, was published and subsequently distributed in early February 2018. Currently there is discussion over whether the current white paper should be revised and re-issued. This debate may be overtaken with the forthcoming review of ATP-3.3.6 where FP Command and Control is set to be discussed in far greater detail, possibly as a stand-alone annex.

• **4 - Air & Space Contribution to the Countering-Improved Explosive Devices (C-IED) Fight in NATO.**

In the era of the NATO-led International Security Assistance Force (ISAF), there was considerable focus on countering the Improvised Explosive Device (IED) threat. A major JAPCC work stream was to explore how to optimise the contribution of all the available Air and Space Power resources and capabilities (this included employing personnel and systems in a way that was not originally envisaged or intended) in order to counter the IED threat (see 'NATO Air and Space Power in Counter-IED Operations' Second Edition – a JAPCC White Paper at www.japcc.org). The JAPCC currently maintains a 'watching brief' in this area and remains available, on-call, to support the Counter-Improved Explosive Device (C-IED) Centre of Excellence (COE), Madrid, at short notice, if required. The JAPCC remains connected to various international C-IED fora, and an element of discreet research continues behind-the-scenes in order to maintain currency. An example of this work behind-the-scenes is the inclusion of C-IED in the emerging work on developing an FP Planning Tool.

Cyber Support. JAPCC provided one of the 2 Cyber SMEs in OpFor Cyber for Exercise Trident Juncture 2018, at the request of SHAPE J6 Cyber, and assisted in the scenario development process, preparation of Cyber injects and the Cyberspace Exercise Control/Opposing Forces cell during the Execution Phase. JAPCC also continued to contribute to raising collective awareness through



cooperation with Shape J6 Cyber on policy development and through participation in the Cooperative Cyber Defence COE-hosted International Conference on Cyber Conflict and the Defence Against Terrorism COE-hosted, Terrorist Use of Cyberspace course.

NSO Comprehensive Operational Planning Course (COPC). COPC is conducted at the NATO School Oberammergau (NSO) and is normally run with the assistance of SME Liaison Officers from the functions (navy, army, air, SOF) and JAPCC. JAPCC provided the SME already attending the current review of the Comprehensive Operational Planning Document. The lack of planners at all levels (tactical and operational) requires the NSO to run 8-10 iterations per year. Those iterations fulfil only approximately 25% of the planner requirements for NATO.

Surface-Based Air and Missile Defence. In preparation for the Air and Missile Defence Committee meeting, JAPCC contributed to the Panel on Air and Missile Defence (PAMD) Large and Focus Group meetings

and the related workshops. Here, significant NATO policy documents, like the NATO IAMD Policy were created and amended. Also, JAPCC is a regular participant of the BMD Operational User group and the Joint Capability Group on Ground Based Air Defence. When requested, JAPCC provided subject matter expertise to other workshops, like the AirC2IS Requirements Integrated Project Team, the BiSC NATO A2AD Simulation Study or the NATO Science and Technology study about Hypersonic Operational Threats. In addition, JAPCC supported SBAMD courses at NATO School Oberammergau. The JAPCC also participates in and supports the European Ground Based Air Defence Working Meeting, an initiative (DEU/NLD Framework lead) to bundle the scarce GBAD assets in Europe in the areas of Education, Training and Exercises.

Since mid-2015, JAPCC has been an active member of the multinational BMD experiment Nimble Titan and fills the deputy position in the War Game Control Group. Furthermore, JAPCC provides the deputy in the Operational Control Group for the main IAMD

exercise in the European theatre, Joint Project Optic Windmill which will be executed in March 2019. Also SBAMD expertise was provided for the preparation and execution of the Exercise Ramstein Ambition.

Education and Training on Space Operations.

Since May 2016, JAPCC has served as the Department Head (DH) for the discipline 'Space Support to NATO Operations'. As the DH for Space, the JAPCC coordinates findings and develops solutions for the E&T requirements identified by the Requirements Authority (SHAPE ACOS J3). In May 2018, JAPCC hosted the 2nd Annual Discipline Conference (ADC), which was focussed on discussing current and future developments and changes in the space discipline.

The JAPCC also continued to foster the integration of Space into NATO operations by contributing to the expansion of space training experimentation into the Trident exercise series. To that end, the design of an OPFOR Space structure, including all relevant documents, was designed for Trident Juncture 2018. Within

the execution of Trident Juncture 2018 the roles as OPFOR Space as well as an educational role for the training audience were fulfilled. The preparation and design of the OPFOR Space structure for Trident Juncture 2019 is already ongoing.

Active Engagement

The JAPCC continues to actively engage with various air power stakeholders through working groups and other face-to-face meetings. These engagements included but were not limited to:

The JAPCC Annual Conference. The JAPCC hosted a multinational gathering of distinguished speakers and panellists at the annual Joint Air and Space Power Conference, held in Essen, Germany, October 9 to 11. The conference attracted more than 280 participants, including 55 General and Flag-officers and civilian equivalents.

The theme of this year's conference was 'The Fog of Day Zero', a concept to describe the uncertainty of the



JAPCC Annual Conference Opening Speeches, Essen, Germany, 10 October 2018.

environment and/or an adversary's activity, experienced prior to the start of hostilities or the declaration of war. This uncertainty is often a result of modern adversaries, be they state actors, non-state actors or Violent Extremist Organizations (VEOs), committing hostile actions which remain largely below the traditional 'armed attack' threshold of war and may not be easily recognizable as such by the victim. In fact, modern warfare is not necessarily characterized by a definitive declaration of war, rather it may emerge through a succession of seemingly uncorrelated events. For this reason, the expression 'Day Zero', does not refer to a specific point in time or a specific length of time. The theme provided the catalyst for important debate about how the Alliance might recognize, attribute, and respond to such 'attacks,' using air and space power.

The conference was organised into four themed panels: 'The 'Day Zero' Threat Environment: Modern Threat Vectors, Adversary Shaping Operations and the Article V Threshold'; 'Joint Air Power in the Vanguard of NATO's Response: Capabilities, Vulnerabilities, and Challenges'; 'Does NATO have the Required Mind-set to Fight on Day Zero?'; and 'How can NATO Address Emerging Security Challenges Using Air and Space Power?' The discussions throughout the event resolved into three main threads: What defines an attack?; Is NATO ready?; and What is NATO's response? Details of the discussions and conclusions can be found in the recently published Conference Proceedings at www.JAPCC.org/conference.

Think Tank Forum (TTF). The fifth 'Joint Air and Space Power Think Tank Forum' was conducted at RAF Waddington, England from 10 – 12 April 2018, graciously hosted by the Air Warfare Centre. The objective of this forum was to have an inter-organisational exchange of national Programmes of Work, as well as to share information regarding NATO's future Air Power Strategy, Air & Space Power related challenges and shortfalls and awareness of the key areas of effort of the participants. Participants discussed how to better support NATO/AIRCOM in fostering multinational cooperation and preventing duplication of effort. The Forum was most beneficial in identifying vectors for mutual cooperation and outlining ways for more efficient coordination of the various institutions' projects. Minutes are available upon request from contact@japcc.org.

Joint Air and Space Power Network Meeting (JASPNM). JAPCC hosted the Joint Air and Space Power Network Meeting from 5 – 6 December 2018 with participants from AIRCOM, the NATO HQ, the NATO Science and Technology Organisation (STO), the European Air Group (EAG), the European Air Transport Command (EATC), the European Defence Agency (EDA), the Competence Centre for Surface-Based Air and Missile Defence (CC SBAMD) and the Air Operations Centre of Excellence (CASPOA). Similar to the Think Tank Forum, the JASPN meeting helps to develop better synergies within the Air & Space Power community; however, it brings together NATO and European multinational organizations instead of the sovereign national entities that attend the TTF. The main objective of the Forum is to share information regarding the transformation of Joint Air and Space Power in order to gain awareness of key areas of effort and discuss potential areas of cooperation and prevent duplication of effort. Therefore the JASPN Meeting focusses on creating mutual awareness regarding focus areas, informing about current programmes of work and ongoing projects, as well as establishing objectives for follow-on collaboration. Minutes are available upon request from contact@japcc.org.

NATO's Long-Term Military Transformation (LTMT). The NATO Long-Term Military Transformation (LTMT) programme addresses the full range of security challenges, applies a unifying vision, and advances a conceptual framework for forces and capabilities required to succeed in future operations. To support this programme, JAPCC took part in both workshops for the Strategic Foresight Analysis (SFA) in 2018. As the Framework for Future Alliance Operations (FFAO) was finalized in April this year there was no activity with regards to reviewing.

The first of two SFA workshops in 2018 was conducted in Cadiz in April 2018, and the second early November 2018 in Budapest. The SFA serves as the foundation for the FFAO, which in turn feeds the NDPP in both Step 1 and Step 2 – Determination of Requirements. The specific SFA workshop results can be found in the SFA 2017 Report. Since the SFA 2017 was published early November 2017 the two workshops in 2018 focused on discussions on the impacts of regional development on global security context. The outcome of the

workshops will serve to set the stage for regional focused workshops in 2019. JAPCC will continue to support the LTMT in 2019 as requested from ACT.

COE Programme of Work (POW) Workshop. To make the Request for support (RfS) process more accurate, responsive and transparent ACT created a web-based tool named TRANSNET available to all COEs, managed by ACT. It allows customers to transmit a RfS in a very easy way to the COEs, which makes cooperation more efficient and transparent. As a result, JAPCC received larger portion of RfS (25 of the 33) via TRANSNET to support NATO HQ, its subordinate commands and JAPCC member nations. In accordance with NATO-wide RfS for POW-2019, JAPCC will continue engagement in the requested activities, projects, and working groups on the subjects of NATO exercises, Lessons Learned, Remotely Piloted Aircraft Systems, Space, Autonomous Systems, Optimisation of Air Land Integration, NATO Future ASW Concept, 5th Generation Integration, Integration of UAS into Maritime Operations, NATO Defence Planning Process (NDPP), Strategic Foresight Analysis (SFA), Framework for Future Alliance Operations (FFAO), Aircraft Cross-Servicing and NATO Global Programming.

The Hague University of Applied Sciences (THUAS), Safety & Security Professionals Network. This network was started and is coordinated by The Hague University of Applied Sciences (THUAS). The JAPCC is part of this network that links military, civilian security entities, industry and academia. The network comes together annually for a Seminar which took place during 2018 at the NATO School Oberammergau (NSO) during the period 1 – 3 May 2018. The JAPCC (and hence broader NATO FP) benefits from being part of this organisation as it provides a mechanism where current 'best practice' can be shared. It is worthy of note that by being part of this network, the JAPCC has the opportunity to address an audience of young people who would not normally be exposed to current thinking about the development of Air and Space Power. The JAPCC provides the network with a number of inputs; these include:

- **Curriculum Support.** Through engagement with the teaching faculty provides the university with inputs throughout the year that help develop the curriculum for safety and security studies.

- **Lecturer Support.** Providing, where appropriate, guest lecturer support. In 2018 the JAPCC supported the universities Counter-Terrorism Minor over the period 29 – 30 November 2018.

- **Internship.** Providing a six-month Internship opportunity for one of the universities students. The first internship ran from 25 September 2017 until 31 March 2018. The intern achieved a first-class degree and has gone on to study for a Masters at Kings College, London. The JAPCC gained significant support through this arrangement which is discussed in further detail below.

- **THUAS Attendance at the JAPCC Conference.** The JAPCC provides the university with additional learning opportunities for their students. Under the auspices of this arrangement, seven students and one member of staff from the university attended the JAPCC Annual Conference over the period 9 – 11 October 2018. This activity proved so successful that other opportunities are being investigated for short-term internships and/or providing opportunities for students to attend JAPCC run or JAPCC FP supported activities (e.g. the NSO FP Courses).

Aircraft Cross-Servicing (ACS). AIRCOM is reactivating the ACS programme. JAPCC is supporting AIRCOM by providing guidance and recommendations on the most effective and efficient way to rebuild the ACS capability in the area of processes, organisational structure, and documentation, and assess potential additional ACS capability options for future employment to enhance this operational capability. Through experimentation and writing teams the required documents were further refined. JAPCC as the custodian of the Allied Aircraft Cross-Servicing Publication has sent a Final Draft of the Publication to nations via NSO. Ratification is expected by 2019.

Air-To-Air Refuelling (AAR). The AAR SMEs conducted 15 presentations in 3 nations throughout the year focused on the education and information on increasing interoperability within the AAR enterprise worldwide. Two academic articles were published, three NATO STANAGs and four Standards Related Documents received substantial review and re-writes this



Maritime Air Commanders Conference (MACC) Kalkar, Germany, 23 May 2018.

past year. The AAR SMEs continue to meet with NATO HQ IS-DI and EDA on a quarterly basis to ensure that the strategic direction of the three agencies remain pointed in the right direction.

Maritime Air Coordination Conference (MACC)

The JAPCC organised and hosted the MACC 2018, including the related working groups, at the Kalkar venue on 23-25 May 2018. The Bi-SC annual conference, focusing on maritime air component integration, was co-chaired by the JAPCC Assistant Director (on behalf of ACT), and the Commander Maritime Air NATO (on behalf of ACO). The theme of this year's conference was 'Integration of Unmanned Air Systems into Maritime Operations'. This topic is of wide interest among the maritime community and is also the subject of an ongoing joint study being completed through a combined effort by the JAPCC, the Confined and Shallow Water CoE at Kiel (DEU), and the Combined Joint Operations from the Sea (CJOS) CoE at Norfolk (USA). In addition to the JAPCC and MARAI-RNATO staff, the MACC was attended by 24 Officers representing nine NATO nations, three NATO entities and three NATO CoEs.

JAPCC Custodianships and Involvement in NATO Activities and Working Groups

JAPCC personnel fill chairman, co-chairman, and panel positions on numerous NATO steering bodies as well as providing custodianship to a number of NATO Doctrine documents, as highlighted below.

Chairmanship

- Air Operations Working Group (AOWG);
- Maritime Air Coordination Conference (MACC Co-Chair);
- Vice Chairman – ACG-2 (Effective Engagement);
- NATO Air-to-Air Refuelling Working Group (AAR WG);
- NATO Air Transport Working Group (ATWG);
- Doctrine, Organisation, and Interoperability (DOI) Panel, NATO Force Protection WG;
- Vice Chairman – Next Generation Rotorcraft Capability Team of Experts.

Exercise / Campaign

- Nimble Titan 20, Wargame Control Group and Analysis Team;
- Operations Control Group Joint Project OPTIC WINDMILL (JPOW);
- OPFOR Air-, Space- and Cyber support to Exercise Trident Jupiter 19
- OPFOR Air support to exercise Ramstein Ambition 19



JASPN meeting, Kalkar, Germany, 5 Dec 2018.

Panel Member / Working Group

- Allied Future Surveillance & Control Project Group (AFSC PG);
- Air Capability Group 3 and NATO Electronic Warfare Air Group (NEWAC);
- NATO AEW&C Programme management Organization Board of Directors (NAPMO BOD);
- JPR Forum;
- Air & Missile Defence Committee (AMDC);
- Force Protection (FP) Task Force;
- NATO Special Operations Headquarters (NSHQ) in support of Air Development Program (ADP) for SOF aviation;
- Personnel Recovery/Search and Rescue Working Group (PR/SAR WG);
- NATO Army Armaments Group/Joint Capability Group Vertical Lift (NAAG/JCGVL);
- Helicopter Inter Service Working Group (HISWG);
- European Personnel Recovery Centre (EPRC) calendar;
- ACT, AJP-3.7 Data Fusion Workshop;
- Joint Capability Group Unmanned Aircraft Systems (JCGUAS);
- Joint Capability Group Ground Based Air Defence (JCGGBAD);
- Maritime Operations (MAROPS) Working Group;
- Global Helicopter Operations from Ships other Than Aircraft Carriers (HOSTAC) WG;
- Multinational Through-deck and Aircraft Carrier Crossdeck Operations (MTACCOPS) Working Group;
- ACG 2 – Effective Engagement;
- Amphibious Operations Working Group;
- NATO Bi-Strategic Command Space Working Group (BiSCSWG);
- Next Generation Rotorcraft Capability Team of Experts;
- NLD SBAMD Policy Group;
- NLD Knowledge Network on SBAMD;

- Panel on Air & Missile Defence (PAMD);
- PAMD Workshops and Focus Group;
- ACO Cyberspace Work Shop;
- BMD Operational User Group;
- RIPT AirC2IS;
- BiSC A2AD Simulation Study;
- DEU A2AD Working Group;
- ACG3 - On survivability;
- NEWAC / NEWWG - NATO EW Concept & Doctrine;
- STO SCI-301 Study Group;
- STO SCI-311 Research Task Group;
- Joint Intelligence Working Group;
- Imagery Management Group.

NATO Policy / Doctrine / TTP Support.

Custodian:

- AJP-3.3;
- AJP-3.14 Allied Joint Doctrine for FP;
- ATP 3.3.4 I AT Doctrine;
- ATP 3.3.4 II AAR Doctrine;
- ATP-3.3.4.1 Tactics, Techniques and Procedures for NATO Air Movement Operations;
- ATP-3.3.4.2 Air-to-Air Refuelling;
- ATP-3.3.4.3 Tactics, Techniques and Procedures for NATO Air Transport Operations;
- ATP-3.3.4.4 Tactics, Techniques and Procedures for NATO Airborne Operations;
- ATP-3.3.4.3 TTPs for NATO AT Operations;
- ATP-3.3.6 NATO FP Doctrine for Air Operations;
- ATP-49 (STANAG 2999) Use of Helicopters in Land Operations;
- MC-0610, FP Policy for NATO-Led Operations;
- AD 80-25 ACO Force Protection Directive;
- AASSEP-13 (STANAG 3430) Allied Aircraft Cross-Servicing Publication.

Contributor:

- AJP 3.6 (NATO Joint EW Doctrine);
- AJP-3.3.3 Air-Maritime Coordination (Part of AMCWG);
- AJP-3.7 Allied Joint Doctrine for recovery of personnel in a hostile environment;
- ALP-4.3 Air Forces Logistic Doctrine and Procedures;
- ATP-3.3.3.1 Maritime Air Coordination Procedures;
- ATP 3.3.4.2.1 SRD 1 Guide to Obtaining AAR Clearances and Compatibility;
- ATP 3.3.4.2.2 SRD 2 Recommended AAR Aircrew Certification and Currency;

- ATP 3.3.4.2.3 SRD 3 Tanker;
- ATP 3.3.4.2.4 SRD 4 Tanker/Receiver Clearance Compatibility Matrix;
- ATP 3.3.4.5 AAR Boom-Receptacle Requirements;
- ATP 3.3.4.6 AAR Pro-Drogue Characteristics;
- ATP 3.3.4.7 AAR Signal Lights in Hose and Drogue Systems;
- ATP 102 MISR;
- AIntP xx IMINT TTPs;
- MPP-02 Helicopter Operations from Ships Other Than Aircraft Carriers (HOSTAC);
- Functional Planning Guide for Joint Air Operations Planning (FPG AIR).

Participation in the Air and Missile Defence Committee and Subordinate Bodies.

The JAPCC remains an active participant in the Air and Missile Defence Committee and the PAMD and its subordinate working and focus Groups. Through continuous participation in these various bodies, the JAPCC supports the development of Integrated Air and Missile Defence policy.



- 1 The primary forum for the NATO Command Structure (NCS), the NATO Force Structure (NFS) and COE's to discuss FP challenges; the FPAG feeds the FPWG.
- 2 Strategic, Operational or tactical.
- 3 And subsequently the Force Protection Advisory Group (FPAG).

2019 outlook

2019 Focus Areas

Introduction. JAPCC regularly reviews and realigns its Focus Areas, PoW and organisational structure to ensure that it can continue to address current and future challenges and to provide key decision-makers effective solutions on Air and Space Power challenges, in order to safeguard NATO and the Nations' interests. The JAPCC Focus Areas are approved by the Steering Committee at their annual meeting. In the broadest sense, the JAPCC could address any topic or capability within the realm of Air and Space Power, but closely following current developments throughout the world and within NATO, there are several topics requiring more prominent attention than others. At the Brussels Summit in July 2018, Alliance leaders committed to continuing to deliver on key capabilities, including Ballistic Missile Defence, Space Support in NATO Operations, Anti-Submarine Warfare and Air Command and Control. These subjects, amongst others, provide the focus for the JAPCC's programme of work for the year to come.

Space Support in NATO Operations. NATO's operations are heavily dependent on data and services from space assets, specifically in the areas of communications, surveillance and reconnaissance, global positioning, navigation and timing, meteorology, friendly force tracking, space situational awareness and early warning. In 2019, the JAPCC will continue to work to ensure NATO's space dependencies are understood and addressed appropriately, within the construct of the BiSCSWG (NATO Bi-Strategic Command Space Working Group).

After contributing to the recent 'Policy on Space Support in NATO Operations,' published in May 2018, the JAPCC is eager to support the creation of a future comprehensive space policy for NATO, the call for which was formally announced during the Brussels Summit in July 2018, and on updating the NATO Space Doctrine (AJP 3.3 – Chapter 5). Under the JAPCC's 'Education & Training' Focus Area, JAPCC Space Team, as the Department Head for Space Support in Operations, will prepare and conduct the

3rd Annual Discipline Conference (ADC) 2019 to assess the status of NATO Education & Training in the 'Space Support in Operations' discipline. In addition, JAPCC Space Team, in close cooperation with other space experts from the NATO Command Structure, will support the 'Trident Jupiter 2019' Exercise to assess and refine operational concepts, command and control, command relationships for space support to operations. From the space operators' perspective, the aim of Exercise 'Trident Jupiter 2019' is to continue to integrate space capabilities into terrestrial operations as well as pursue space-related training objectives.

With respect to JAPCC studies related to space support in operations, the JAPCC will publish a white paper titled 'Command and Control of a Space Surveillance and Tracking (SST) Network' in 2019. This paper will publish findings from a study which focussed on the analysis of existing command and control models for tasking multinational SST Networks to populate a database of orbital objects (e.g., spatial debris and manmade objects). Additionally, the JAPCC Space Team is currently working on two new studies: 'Space resiliency as a Combined Challenge' and 'Requirements for a National Space Operations Centre with Regards to NATO's Need for Information'; Publication of these study results are expected in late 2019/early 2020, respectively.

Exercise Support. JAPCC will continue to provide substantial support to NATO exercises in 2019. Events to be supported will be Ramstein Ambition 19 at AIRCOM and Trident Jupiter 19 at the Joint Warfare Centre (JWC) in Stavanger. JAPCC also provides continued support to the JWC in developing and updating exercise scenarios to include the latest developments in joint (and aerial) warfare.

Air Command & Control and Joint ISR. NATO is implementing a fully interoperable Air Command and Control System (ACCS), which is intended to provide for the first time a fully integrated set of tools to support the execution of all air operations in real-time operations. ACCS also has the option to perform planning and tasking for air operations (e.g. OPTASK LINK, ACO etc.) which is referred as the non-real time environment. ACCS will make available the capability to



plan, direct, task, coordinate, supervise, assess, and report on the operation of all allocated air assets in peace, crisis, and conflict.

SHAPE has started the review of the Comprehensive Operations Planning Directive (COPD) in the beginning of 2018. After the COPD has been validated during 2019, the JAPCC Air Functional Planning Guide will then be reviewed in line with the COPD. Upon completion of the process within the other Domains (Land, Maritime, CIMIC etc.) the Operational Planning Process on the Tactical and Operational level will be fully updated.

JAPCC also suffers from a shortfall in manning with only one Air C2 and one Air Operational Planning position filled. However, the importance of Air Command & Control and Operational Planning requires that JAPCC remains actively involved in most of these topics to the extent that limited manning allows.

Against the backdrop of the changed security environment, C4ISR in NATO shows several shortfalls in policies, concepts, and structures which need to be ad-

ressed in order to maintain the operational edge. The adaptation of concepts and structures, the willingness to share information, and the availability of trained operators in sufficient numbers in the NATO Command Structure and in NATO Force Structure C2 elements are essential to nearly all improvement measures. Partnering with capable national JISR and Joint Force Air Component staffs is an indispensable prerequisite. JAPCC will play a contributing role in several working groups developing solutions to these challenges.

Logistics. NATO is required to be able to carry out a range of smaller but demanding operations, and the Alliance must retain the capability to conduct large-scale high-intensity operations including in support of collective defence. To undertake these missions, the Alliance must be able to launch and sustain these missions. Since only a few Allies can independently deploy and sustain their forces, it is important, that NATO and Allies continue to pursue the concept of Collective Logistics in order to provide NATO commanders the greatest flexibility in current and future NATO operations. Therefore logistics work in NATO

will be pursued along four main lines of effort: develop more capable and interoperable joint logistics capabilities at the required readiness; optimise Command and Control (C2) of logistics support; improve deployability of NATO forces; and enhance sustainability of NATO forces. JAPCC is engaged in these topics and will continue to be so.

Joint Precision Strike, including PGMs. NATO is continuously seeking to share the burden of providing expensive defence equipment more equally across the Alliance. A new multinational project was launched during the 2014 Wales summit to develop innovative ways of increasing the availability of munitions to the Alliance. With Denmark in the lead, the project focuses on multinational approaches toward air-to-ground precision-guided munitions (PGMs). As of November 2018, eleven Alliance nations had joined the project, placing munitions orders through NSPA. On the 22nd of August 2018 Allies received first shipment, and the second and third rounds of acquisition for PGMs are already underway. In 2016, the JAPCC assumed the role of Vice Chairman of the ACG-2 (Air Capabilities Group focused on Armaments), which will continue to devote much of its effort in the upcoming years toward addressing this Priority Shortfall Area.

Air Offensive Enablers (SEAD, EW, AEA). NATO recognises the electromagnetic environment (EME) as an operating environment. Following the restoration of EW and SEAD subject matter expertise to the staff in late 2017, the JAPCC again participates in Aerospace Capability Group 3 (ACG3) and the NATO EW Advisory Committee (NEWAC), which are the top level Alliance EW bodies and are responsible for all aspects of EW in every domain. JAPCC will continue to engage with the aforementioned bodies in order to provide support with Subject Matter Experts.

Air Support to Special Operations Forces. The Air Development Program (ADP) serves as the leader for NATO SOF Air/Aviation by determining and improving quantitative and qualitative aspects of SOF Air/Aviation across the network of NATO Special Forces Headquarters (NSHQ) nations and partners. ADP seeks to deliver high-quality support to nations by providing policy, doctrine, training, education, assessments, and evaluation. In November 2018 JAPCC was involved in a meeting with the new ADP Director to define future cooperation in support of Air SOF. For 2019, JAPCC will continue to support ADP in all the future development within the NATO SOF Aviation Capability Development Roadmap.

JAPCC Joint Air and Space Power Conference, Essen Convention Centre, Germany, 8 – 10 October 2019. The Annual Conference is one of the most important events on the JAPCC's annual calendar. It brings together senior NATO and national military and political leaders, members of academia and industry partners in a forum that encourages open discussion of issues of strategic interest to the Alliance and partners. The topic for the JAPCC Conference 2019 will be 'Shaping NATO for Multi-Domain Operations of the Future.' A conference thesis and information about the agenda and panel composition are in development and will soon be published at www.japcc.org/conference.

Conclusion. Thank you for taking the time to read the JAPCC Annual report for 2018. We hope you have found this report informative, and that it has given you a greater understanding of and appreciation for the value and relevance of the JAPCC to the Alliance. For more information on the JAPCC, please contact us via email at contact@japcc.org or visit our website at www.japcc.org.



JAPCC invites you to attend the:

2019 | AIR AND SPACE POWER CONFERENCE

**Shaping NATO for
Multi-Domain Operations of the Future**

8–10 October 2019, Messe Essen, Germany

Reserve the date in your calendar!



Joint Air Power Competence Centre

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