Allied Data Publication 34

(ADatP-34(F))

NATO Interoperability Standards and Profiles

Volume 1

Introduction and Management

19 January 2012

C3B Interoperability Profiles Capability Team

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1. INTRODUCTION

001. This agreed document was developed by the Interoperability Profiles Capability Team (IP CaT) under the authority of the NATO Consultation, Command and Control Board (NC3B). It was noted by the NATO C3 Board (AC/322-N(2012)0002-AS1 Dated 19 Jan 2012) making the Volume 2 standards and profiles mandatory for use in NATO common funded systems, and made available to the general public as a replacement for ADatP-34(E).

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2. PURPOSE OF THE NISP

002. The NATO Interoperability Standards and Profiles (NISP) provides the necessary guidance and technical components to support project implementations and transition to NATO Network Enabled Capability (NNEC). Also the Combined Communications Electronics Board (CCEB) nations use the NISP to publish the interoperability standards for the CCEB under the provisions of the NATO-CCEB List of Understandings (LoU) detailed in Appendix A of this volume. In addition, in order to support the Prague Capabilities Commitment (PCC), more emphasis is placed on interoperability profiles to support the NRF and transition from today's legacy systems to NNEC.

003. The purpose of the NISP is to:

- Encourage Nations to use the same standards as within the NATO CIS implementations in NATO led operations;

- Serve as the principal source of technical guidance for management of NATO CIS project implementations and transition to NNEC;

- Track technology developments in order to optimise application development;

- Identify and manage all applicable CIS standards as a baseline for optimising programmes and project selection and adherence;

- Assess CIS products for NATO application;

- Support architecture-based CIS programme development and evolution;

- Provision of technical reference and rationale to promote and optimise NATO CIS interoperability;

- Promote NATO internal, Nation to NATO and Nation to Nation interoperability;

- Provide guidance on transformation to NNEC;

- Identify applicable Design Rules to support cooperation in federated common missions with proven solutions;

- Identify applicable Profiles as a baseline for optimising service and standards implementation and utilization to support cross-domain scenarios.

004. The stakeholders of the NISP are all NNEC stakeholders involved in development, implementation, lifecycle management, and transformation to an NNEC environment. Stakeholder review will take place periodically and the results reflected in this section.

005. This document provides a general description of the current version of the NISP. Volume 1 of the five volumes deals with the NISP purpose, the structure and the process of collecting

standards from stakeholders, including the configuration management and publication of the NISP. Volume 2 focuses on near-term implementation (i.e. present[1] to 2 years in the future), Volume 3 focuses on mid-term implementation (2 to 10 years in the future). Volume 4 provides Interoperability Profile Guidance and references. Volume 5 provides Design Rule Guidance and references.

006. The mandatory standards and profiles documented in Volume 2 will be used in the implementation of NATO Common Funded Systems. Participating nations agree to use the mandatory standards and profiles included in the NISP at the Service Interoperability Points and to use Service Interface Profiles among NATO and Nations to support the exchange of information and the use of information services in the NATO realm.

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[1]Date of Approval by the NC3REPS on behalf of the NC3B

3. NISP STRUCTURE

007. The structure of the NISP is determined by several factors:

• Ease of use for the users of the NISP;

• Implementation strategy of the NNEC vision;

• Nature of standards, profiles and design rules.

008. Partitioning the NISP into timeframes of near and mid-term was influenced by the NNEC FS, national NEC development and industry best practices. One common thread through all these efforts is the need to partition NATO CIS implementations and transition to NNEC into well defined time periods which are:

• Near-term: 0 to 2 years;

• Mid-term: 2 to 10 years;

009. The NISP reflects these timeframes in individual volumes. To provide consistency between these volumes and ease of tracking technology trends and influences, each of the volumes has similar structures containing major sections dealing with:

• Technology

• Standards

• Transition

010. These similar structures enable one to focus in on a stakeholders area of interest and to track this area of interest as it transforms towards the NNEC paradigm.

011. Standards are the focus of volume 2 and 3. The standards referenced in these volumes provide an overview of those standards that must be taken into account when developing profiles and architectures within the applicable period of time.

012. The profiles in volume 4 are based on mission requirements which influence required services and interoperability points.

013. The NISP contains the five following main volumes:

014. **Volume 1 - Introduction and Management**: This volume provides the management framework for the development and configuration control of the NISP and includes the general management procedures for the application of the NISP in NATO C3 systems development and the process for handling Request for Change Proposals (RFCP).

015. **Volume 2 - Near Term**: This volume provides the interoperability standards and profiles in the near-term period. This is the short term step describing the state of-the-art of NATO and National systems today and the framework for new systems actually under procurement or specification. For new systems, it contains near-term standards, profiles, and technologies to support the initial steps towards Networking and Information Infrastructure (NII).

016. **Volume 3 - Mid to Far Term**: This volume will describe the evolution from platform based legacy systems to the federated Network Enabled Capabilities environment where the functionality is made generally available as "services on the net". Ultimately the goal is that the functionality of the most useful services shall be available to authorized users in each situation. The focus of the volume is on the mid-term perspective having a time frame of 2 to 10 years into the future from the publication of this version of the NISP. This timeframe encompasses the realization of a fully network enabled NATO environment.

017. **Volume 4 - Interoperability Profiles and Guidance**: This volume provides Guidance on the development of Interoperability Profiles and references to published profiles. Interoperability Profiles aggregate references to the characteristics of other profiles types to provide a consolidated perspective. Interoperability Profiles identify essential profile elements including Capability Requirements and other NAF architectural views, characteristic protocols, implementation options, technical standards, Service Interoperability Points, and the relationship with other profiles such as the system profile to which an application belongs. Interoperability profiles will be referenced in the NISP for a specified NATO Common Funded System or Capability Package to include descriptions of interfaces to National Systems where appropriate.

018. **Volume 5 - Design Rules**: This volume provides Guidance on the development of Design Rules and references to published design rules.

019. Technology standards will transition through a life-cycle. This life-cycle is used to refine the categorisation of standards within volumes 2 and 3 and is also a key to providing guidance on the use of standards in the development and transition of NATO CIS. The NISP has adopted the five categories of in the life-cycle of standards shown below in Figure 3.1.
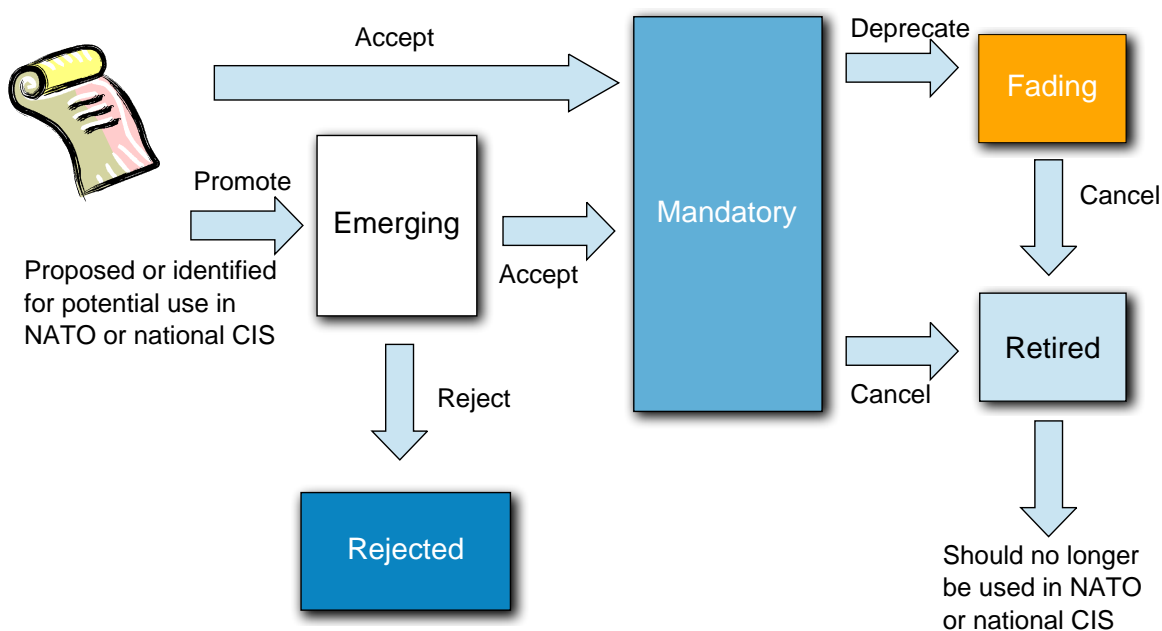
Figure 3.1. Standards Categories

020. Proposed standards can be accepted as emerging standards in order to follow their developments and decide if they can be promoted to mandatory standards. In some cases proposed standards can be readily accepted as mandatory standards. Emerging standards have been partitioned into specific categories of emerging near-term, and emerging mid-term to better support the transition to NNEC. Similarly, containment standards have been classified as either fading or retired.

021. A short description of each category is described below:

- **Mandatory**: A standard is considered **mandatory** if it is mature enough to be used immediately. This means that it may both be applied within existing systems and in within midterm future planned systems.

- **Emerging near-term**: A standard is considered **emerging near-term** if it is mature enough to be used within the 0 - 2 year time frame of Volume 2.

- **Emerging mid-term**: A standard is considered **emerging mid-term** if it is sufficiently mature to be used within the current or next planned systems. This means that it may be applied within future mid-term planned systems. However they may not be immediately suitable if, for example there is insufficient support from commercial companies or because the underlying technology is considered not mature enough. In these latter cases they could be categorized as **Emerging far-term**.

- **Fading**: A standard is considered **fading** if the standard is still applicable for existing systems. The standard however is becoming obsolete or will be replaced by a newer version or another

standard. Except for legacy systems or interoperability with legacy systems, the standard may not be used.

- **Retired**: A standard is considered **retired** if the standard, that has been used in the past, is not applicable for existing systems.

- **Rejected**: A standard is considered **rejected** if, while it was still emerging, it is considered unsuitable for use within NATO.

022. Each standard in the NISP has a set of categories allocated to it that are applicable to the timeframe covered:

- Volume 2 - Near-term: Category can be "Mandatory", "Emerging near-term", "Fading" or "Retired"

- Volume 3 - Mid-term: Category can be "Emerging mid-term"; and "rejected";

- Volume 3 - Far-term: Category can be "Emerging far-term" and "rejected".

3.1. NISP STRUCTURE DRIVERS

023. In general, systems development approaches suggest a clean line of reasoning from requirements capturing to architecture, to design and build via testing to implementation and utilisation and finally to retirement. In practice there is not always an opportunity (time or money) for such a "clean" approach and compromises must be made: from requirements immediately to build and implementation. In recognition of this fact NATO has developed a parallel track approach, which allows some degree of freedom in the systems development approach. Although variations in sequence and speed of the different steps in the approach are possible, some elements need to be present in one form or another. Architecture, including the selection of appropriate standards and technologies, is such a mandatory step.

024. In a top-down execution of the systems development approach, architecture will provide guidance and overview to the required functionality and the solution patterns, based on longstanding and visionary operational requirements. In a bottom-up execution of the approach, usually responding to urgent requirements and operational imperatives, architecture will be used to assess and validate chosen solution in order to align with the longer term vision.

025. The NISP is a major tool for the architecture work and must be suitable for use in the different variations of the systems development approach.

026. SOA, NNEC Roadmap milestones, and the agreed Overarching Architecture also influence the structure of the NISP.

3.1.1. NATO Interoperability Standards and Profiles Application to Architectures

027. The NATO Interoperability Directive (NID) defines what types of architectures are to be developed within NATO: namely Baseline Architectecture (BA), Target Architecture (TA),

Reference Architecture (RA), and Overarching Architecture (OA). These architecture types can be related to the NISP Volumes 2 and 3 as follows:

- Volume 2 contains the standards mostly applicable to the TA's and BA's;

- Volume 3 contains the standards mostly applicable to the RA's and OA.

028. In particular the relationship with the Overarching Architecture is of a reciprocal nature. The OA also provides inputs to the NISP by identifying the technology areas that in the future will require standards. The OA also provides guidance on the coherence of standards by indicating in which timeframe certain standards and profiles are required.

029. The work on RA's and TA's will benefit from the NISP by selecting coherent sets of standards for profiles and design rules.

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4. NISP AND CONFIGURATION MANAGEMENT PROCESS

030. The NISP has to be periodically updated to account for enhancements in technology. Updates to the NISP are handled through Requests For Change Proposal (RFCP). RFCPs are usually reviewed at regularly scheduled IP CaT meetings. RFCPs deemed urgent are handled in an expedited manner, outside the normal meeting schedule of the IP CaT with a reply to the RFCP originator within two weeks.

031. The five volume version of the NISP will be submitted to the NC3 Board in the first quarter of each year after internal review by the IP CaT. The version under review is a snapshot in time of the status of standards and profiles. The NISP database of standards and profiles is the definitive source of the current status of standards and profiles. The database will be updated as soon as the RFCP has been approved by the appropriate authority (NC3 Board).

4.1. NISP UPDATE PROCESS

032. Updating of the NISP and its associated database will be conducted by a managed, rolling review process which will take into account information on standards available from a wide variety of sources. The IP CaT acts as the hub for this maintenance activity, supported by the NHQC3Staff as required. The information updating process is based on Requests For Change Proposal (RFCPs).

4.2. REQUEST FOR CHANGE PROPOSAL (RFCP)

033. Request for Changes Proposal (RFCP) to the NISP will be processed by the IP CaT following the process outlined in the Figure 4.1 below:
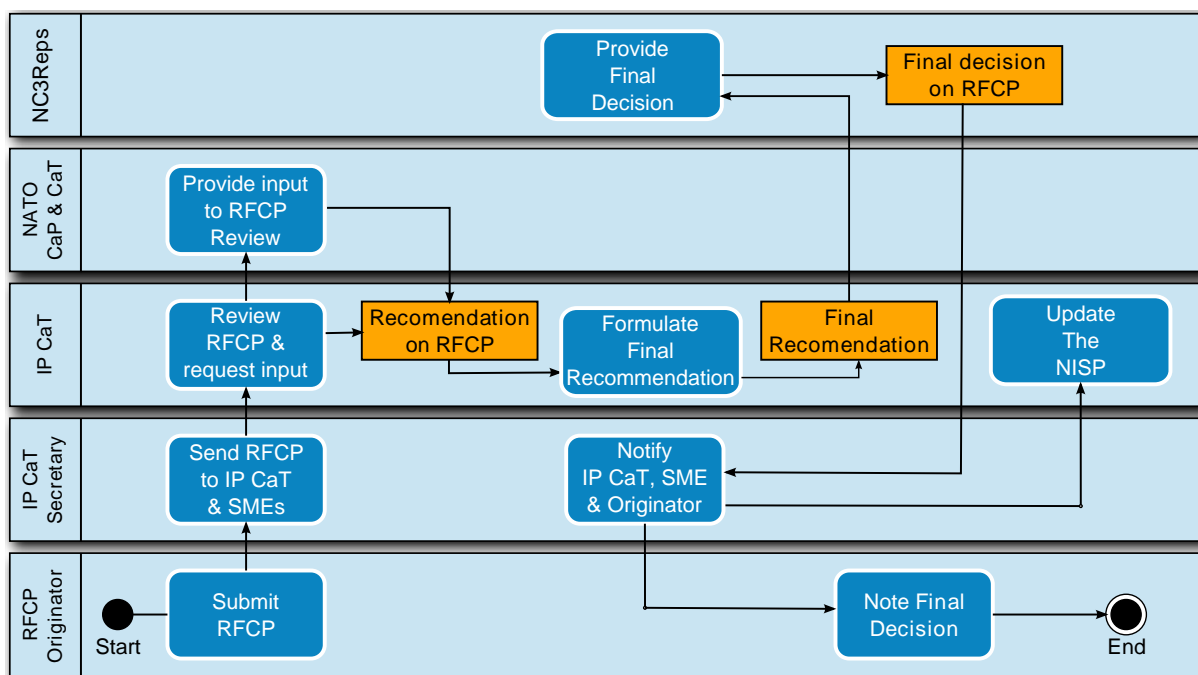
Figure 4.1. RFCP Handling Process

034. The primary point of contact for RFCP submission is the through IP CaT web site. RFCPs may be submitted to the IP CaT through a number of channels, including:

- IP CaT Subject Matter Experts

- Strategic Command representatives;

- NATO Agencies representatives;

- Other Capability Panels and Capability Teams of the NC3 Board;

- NC3Board Staff representatives;

- NATO working groups / committees responsible for a specific standards domain;

035. Approval of RFCPs will be coordinated with the responsible NC3B sub-struture authorities where appropriate. In situations where a timely response is requested by the RFCP submitter, the IP CaT will make its recommendation directly to the NC3REPS. Appendix B contains a detailed description of the RFCP process and the form for submitting RFCPs.

4.3. COORDINATION WITH NATO PMOS

036. The co-ordination with the NATO Programme Management Offices (PMOs) is primarily realised through the Strategic Commands representatives to the IP CaT. In addition, the IP CaT

POW development takes into account the requirements of NATO programmes, which is derived from the programme increment currently under design.

4.4. NATIONAL SYSTEMS INTEROPERABILITY COORDIN-ATION

037. Each of the IP CaT subject matter experts are responsible for:

• Providing the IP CaT with the appropriate and timely inputs with respect to interoperability with national systems;

• Co-ordination of the national position, including co-ordination with national representatives of other capability panels;

• Providing the IP CaT with the appropriate technical information based on the national market assessment.

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A. NATO-CCEB LIST OF UNDERSTANDINGS (LOU)

038. Editorial Note: The intent of the NATO-CCEB LoU remains extant even though from 2007 onwards the NISP replaced the NC3TA, the NCSP became extinct, the NATO Overarching Architecture, the NNEC evolved considerably and the NC3B organization changed.

A.1. LIST OF UNDERSTANDINGS BETWEEN NATO AND THE CCEB

039. References:

1. NATO Letter AC/322(SC/5)L/144 of 18 October 2000

2. CCEB Letter D/CCEB/WS/1/16 of 9 November 2000

3. NATO Letter AC/322(SC/5)L/157 of 13 February 2001

040. Purpose

041. The purpose of this document is to provide an enduring record of the understandings that have been reached between NATO and the Combined Communications Electronics Board (CCEB) in regard to the harmonization of the NATO and CCEB technical architectures

042. Background

043. At reference 1, NATO (through the ISSC) noted the parallel activities in NATO and the CCEB to develop a multi-national technical architecture. As this represented an opportunity to converge on a single technical architecture NATO extended an invitation to Australia and New Zealand, as non-NATO members of the CCEB, to participate as non-voting observers in the NATO Open Systems Working Group (NOSWG) meetings and on-line discussions. NATO (via the ISSC) assured Australia and New Zealand that their technical contributions would be accorded the same consideration as all other participants in NOSWG meetings.

044. The CCEB, at reference 2, accepted these invitations and confirmed that it was a CCEB priority to develop a single technical architecture to enhance interoperability between NATO and CCEB nations. Collaborative work with NATO and CCEB subject matter experts in early 2001 demonstrated that harmonization of the relevant sections of the CCEB and NATO technical architectures was achievable. Further collaborative effort throughout 2001 resulted in a harmonized technical architecture consisting relevant portions of NCSP Ver 2, ACP140A and CCEB Pub 1007.

045. To ensure that a single technical architecture would recognize the needs of all CCEB nations, the CCEB sought clarification on Australia and New Zealand participation in technical architecture development and maintenance. Of particular note were the equity arrangements and opportunities for Australia and New Zealand to contribute to and influence future technical architecture development, and access to all relevant standards and documents referenced in

the NATO technical architecture. The ISSC has assured the CCEB that technical contributions from Australia and New Zealand will be accorded the same consideration as those submitted by all other participants at NOSWG meetings at reference C and that the ISSC will support the release of relevant NATO documents to Australia and New Zealand, subject to NATO Policy regarding the release of NATO documents to non-NATO nations and NATO Security Policy. Subsequently the CCEB confirmed its intention, subject to acceptance of the NATO NCSP Vol 4 version 3 by all CCEB nations, to adopt it as its technical architecture.

046. The September 2001 NATO Open Systems Working Group meeting drafted a List of Understandings to document agreements and processes that would provide an enduring record for future NOSWG participants of the background of the technical architecture harmonization initiative, and the continuing role of Australia and New Zealand (as non-NATO nations) in this activity.

047. <u>List of Understandings</u>

048. The following understandings and undertakings have been agreed between NATO and the CCEB in regard to the harmonization of current and future versions the NATO and CCEB technical architectures:

a. NATO desires that the NC3TA be acceptable to all the CCEB nations.

b. The CCEB intends to adopt NC3TA Volume 4 (NCSP) as the CCEB technical architecture following its acceptance by the all CCEB member nations.

c. The CCEB desires that the scope of NC3TA Volume 4 (NCSP) be comparable to ACP140A and the rationale for NCSP standards selection be detailed in a NATO document able to be referenced in CCEB policy.

d. Australia and New Zealand, as non-NATO members of the CCEB, are invited to participate as observers and their technical contributions will be accorded the same consideration as those submitted from all other participants in NOSWG meetings. Being non-NATO nations, Australia and New Zealand acknowledge that they are not able to vote in NOSWG matters.

e. The CCEB will note any variances in CCEB interoperability standards in the remarks column of the NCSP standards tables with the remark 'For CCEB interoperability the standard is ...'

f. If necessary, Australia and New Zealand will develop and publish national supplements to document national variances or exceptions to NC3TA NCSP standards. These instances are expected to be rare. Any nationally approved Australian and New Zealand national supplements to the NC3TA NCSP will be forwarded to the NOSWG Secretary for formal distribution to all NATO nations.

g. Any Request For Change Proposals (RFCPs) or amendments proposed to the NC3TA NCSP (Volume 4) by NATO nations will be distributed in accordance with NATO policy for the release of NATO documents to non-NATO nations (via email to the maximum extent possible in accordance with NATO Policy on the use of the Internet) by the NOSWG Secretary

to the Australian and New Zealand representatives to the NOSWG for staffing nationally within Australia and New Zealand.

h. Australia and New Zealand will be provided access (in a readable electronic format wherever possible) to all standards and documents listed in the NC3TA NCSP to the maximum extent possible in accordance with NATO policy for the release of NATO documents to non-NATO nations and NATO Security Policy. The United Kingdom will sponsor release of the relevant NATO documents to Australia and New Zealand.

i. As necessary, the United Kingdom Mission in NATO will act as the Point of Contact for distribution of all NC3TA NCSP documents between NATO and Australia and New Zealand.

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B. CONFIGURATION MANAGEMENT OF NISP

B.1. INTRODUCTION

049. Updating of the NISP and its associated database will be conducted by a managed, rolling review process which will take into account information on standards available from a wide variety of sources. The IP CaT acts as the hub for this maintenance activity, supported by the NHQC3Staff and NC3A personnel as required.

B.2. CM ORGANIZATION

050. For the NISP, authority to act as the Configuration Management Board (CMB) lies with the NATO C3 Representatives on behalf of the NATO C3 Board. The IP CaT acts as the Configuration Control Board (CCB), to which all RFCP's must be submitted for evaluation, approval and inclusion. In conducting this task, the IP CaT will be supported by the NC3A (in technical and procedural considerations) and in particular instances by working groups where specific technical advice and reference may be required. Thus the CM organisation for the NISP may be represented as follows:

051. **CMB for the NISP is responsible for:**

- National Endorsement of the NISP

- Promulgation of the NISP throughout NATO

- Monitoring and highlighting project elements which are not in conformance with the NISP

- Replying to originators as to the acceptance/modification/rejection of their RFCPs

052. **CCB for the NISP is responsible for:**

- Processing Change Requests

- Updating and Maintaining the NISP documents

- Assessing related technical developments for inclusion

- Coordination with NC3Staff, NC3B Capability Panels and Teams

- Review and evaluate projects compliance with NISP

- Technical advice and support

- Reporting/recommending new versions to the NC3REPs.

053. The information updating process is based on Requests For Change Proposal (RFCP's).

054. Approval of RFCP's will be coordinated with the responsible subject matter experts when appropriate. In situations where a timely response is requested by the RFCP submitter, the IP CaT will make its recommendation directly to the NC3REPS. The paragraphs below contain a detailed description of the RFCP process and the form for submitting RFCPs.

B.3. REQUEST FOR CHANGE PROPOSAL (RFCP)

055. Updates to the NISP are handled through Requests For Change Proposal (RFCP). RFCPs are usually reviewed at regularly scheduled IP CaT meetings. RFCPs deemed urgent are handled in an expedited manner, outside the normal meeting schedule of the IP CaT with a reply to the RFCP originator within two weeks. Requests for Changes Proposal (RFCP) to the NISP will be processed by the IP CaT following the process outlined in Figure B.1.
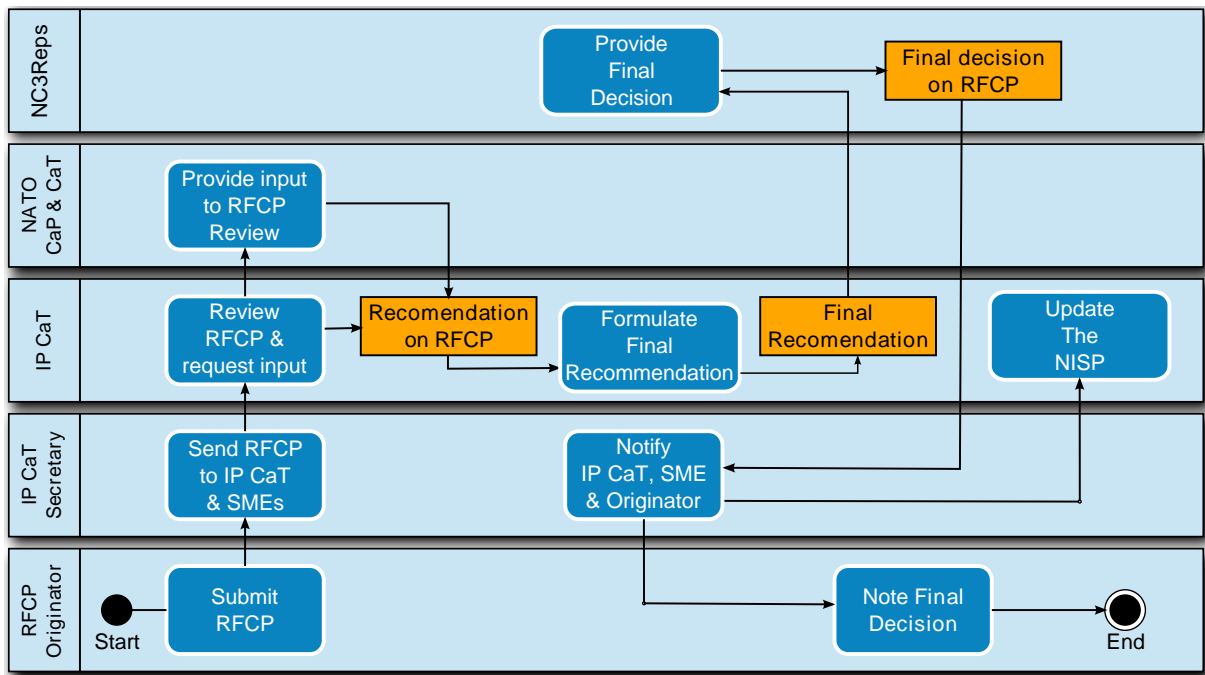
Figure B.1. RFCP Handling Process

B.4. ROLE AND RESPONSIBILITIES OF THE NC3B SUB-STRUCTURE

056. The NC3B Capability Panels will contribute to the development of the NISP in their respective C3 areas of responsibility by responding to the RFCP as indicated above. The co-ordination of NISP development effort throughout the NC3B sub-structure should be based on the following guidance.

057. RFCPs are handled at the IP CaT and national levels. The normal procedure for handling RFCPs call for the IP CaT to review the status of the RFCPs presented at its previous meeting, their content is discussed and the IP CaT defines its position with respect to these RFCPs. If the RFCP issue is covered by other working groups, these groups must be formally requested to provide comments. National subject matter experts may look for some additional review of the RFCPs at a national level. Significant problems identified in this process should be brought to the attention of the IP CaT within a period of eight weeks. The final deadline is however the date of the meeting of the final review of the NISP. This period is meant to encourage tasking of national experts to verify national positions and to co-ordinate with national representatives in other capability panels.

058. The secretaries of the Capability Panels will constitute the primary point of co-ordination with the IP CaT, to help the IP CaT to obtain the adequate support from each Capability Panel;

059. In special cases, specific requests for information or even questionnaires will be sent to the relevant Capability Panels or Teams, in order to receive expert views on specific issues, technologies, or other relevant information.

060. The IP CaT Leader (or suitably delegated IP CaT subject matter experts) will be available to participate in any Capability Panel or Team meeting when necessary or required.

061. RFCPs requiring a response in a more timely manner will be handled by the IP CaT outside its scheduled meetings and within a two week period from receipt of the RFCP. The IP CaT will use a web based collaboration tool, to discuss and develop a recommendation regarding these urgent RFCPs. The IP CaT recommendation will be passed directly to the NC3REPS, via its secretary, for approval by the NC3REPS. Once approved by the NC3REPS, the NISP database will be updated to reflect the NC3REPS decision.

062. The chairman IP CaT will give an annual update to the NC3REPS highlighting the RFCPS handled by the IP CaT including:

• RFCPS related to the POW of Capability Panels

• IP CaT recommendations for standard status to be reviewed by Capability Panels

B.5. RESOURCES

063. As described above, the CM organisation is dependent on resource contributions from NATO and the NATO nations through their participation in the various Capability Panels and Teams involved in the CM process. This support will typically take the form of reviews and submitting RFCPs and to exercise the responsibilities of the CMB and CCB.

064. As NISP custodian, the IP CaT annually determines the overall update task requirement and associated resources necessary for its completion. Tasks that will be undertaken by national sources will be initially consolidated under the IP CaT. Those that can be more effectively

undertaken by the NC3A (e.g. specialist technical or procedural support), will be endorsed by the IP CaT as part of the NC3A Programme of Work, and funded from NC3B resources.

B.6. BASELINE

065. The rationale for establishing a formal NISP Baseline derives from the interdependency of all volumes, and the need to maintain coherence throughout their individual and collective content, in particular across Volumes 2 through 5.

066. When a version of the NISP is considered updated, that is, all applicable RFCP's submitted have been actioned, it will be baselined by the IP CaT for release to the NC3B and recommended for promulgation to NATO. This Baseline applies to the NISP in its entirety, regardless of whether any particular volume has been subject to RFCP procedure or not since the previous Baseline was issued, and replaces the previous Baseline in totality. It signifies a specific point in the update cycle of the NISP as described previously.

067. Standards and profiles will be maintained in an online database that will be updated when approved by the authorized authority.

068. The formal publication of the NISP, ADatP-34 will be developed in accordance with AAP-3: Procedures for the Development, Preparation, Production and the Upgrading of NATO Standardization Agreements (STANAGs) and Allied Publications (APs).

B.7. REQUEST FOR CHANGE PROPOSAL (RFCP) GUID-ANCE

069. In order to process any RFCP it is important to provide as much information as possible.

070. Changes should outline the key elements of the proposed change(s), references to associated documentation and description of perceived technology trend (if appropriate). Changes should only be proposed in areas where a technology is gaining a broad market acceptance and mature product base.

071. Requests for new standards will address details such as a full specification title, description of applicability, and reference to a Web address or other source. Changes to, or deletion, of existing standards will require appropriate support justification.

072. Under normal circumstances, changes to mandatory standards will have already, for example a standard possibly proposed as maturing from 'emerging' to 'mandatory'.

073. Rationale for changes must be adequately supported with implementation evidence in order to allow the review process to proceed.

074. The rationale used by the IP CaT for determining the selection of standards and profiles for inclusion in the NISP will be part of the IP CaT Standard Operating Procedures.

B.8. RFCP FORM

075. NISP RFCPs are submitted via the web enabled RFCP submission form under the IP CaT web site.

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