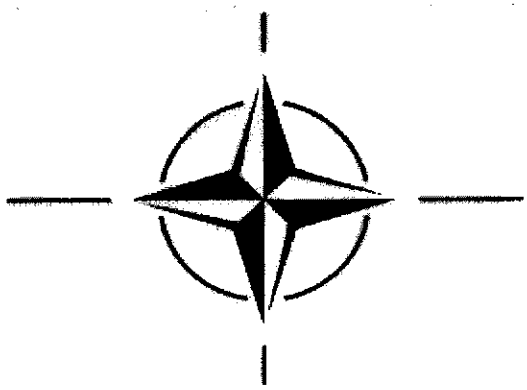
ALLIED
ENGINEERING
DOCUMENTATION
PUBLICATION

AEDP-9
(Edition 1)



NATO Primary Imagery Format (NPIF)

Implementation Guide

MARCH 2006

AEDP-9
(Edition 1)

NORTH ATLANTIC TREATY ORGANIZATION

NATO STANDARDIZATION AGENCY (NSA)

NATO LETTER OF PROMULGATION

March 2006

1. AEDP-9 (Edition 1) - NATO PRIMARY IMAGERY FORMAT (NPIF) IMPLEMENTATION GUIDE is a NATO UNCLASSIFIED publication.

2. AEDP-9 (Edition 1) is effective upon receipt.

J. MAJ
Brigradier General, POL(A)
Director, NSA

RECORD OF CHANGES

Change Date	Date entered	Effective Date	By Whom Entered

FOREWARD

1. This Allied Engineering Documentation Publication (AEDP) was prepared by the NATO 7023 Custodial Support Team in response to user community requests for implementation guidance, related test plan and configuration management plan of STANAG 7023.

2. Questions or comments should be directed to the Custodian for this document.

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1 Introduction

1.1 Aim

This Allied Engineering Document Publication (AEDP) provides the North Atlantic Treaty Organisation (NATO) Primary Imagery Format (NPIF) community with technical guidance on developing and testing implementations of STANAG 7023

1.2 AEDP Scope

This document includes technical guidance information for developing and testing implementations of NPIF. The sections of this document are as follows:

Annex A: Implementation Guidance

Annex B: NPIF Test Plan

Annex C: NPIF Configuration Management Plan

1.3 Point of Contact

1.3.1 NPIF Custodian

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Annex A - Implementation Guidance

A-1 Preamble / Postamble

A-1.1 Preamble

A 7023 preamble is a collection of 7023 packets received (data link), or read from some medium (tape/disc etc.) before the first data segment. The contents of the preamble contains enough information for the receiving ground station to interpret the contents of the following data files/packets (the only proviso being the hardware and software capability exists within the chosen ground station).

For example one would expect to find the following category of data files in the preamble:

Format Description Data	Time Tag.
Sensor Parametric Data	Information required to decode the following sensor data.
Target Data	Target description data.
Mission Data	Mission Details.

Table A.1 – Example Preamble Data

The preamble is usually produced prior to the reconnaissance sortie and in this case is not related in time to dynamic tables generated during the sortie. For this reason the Time Tag in the preamble is set to zero. It is possible to post-write data to the preamble within a sortie. In this case the Time Tag in the preamble is also set to zero.

The default settings for the sensors, gimbals, etc are defined in the tables in the preamble. During a data segment these values may change but at the start of each new segment they will take on the default values again.

Preamble data may be repeated in the postamble (with a change of segment number and time tag). Should the preamble be corrupted in any way, the repetition of preamble information would enable imagery data to be recovered. As the size of the preamble data is likely to be minimal compared to the size of the sensor data this repetition is considered to have minimal overhead for transmission or recording.

A-1.2 Postamble

A postamble contains enough indexing data files to define the position, type of targets, events and sensor operating periods contained within the preceding data segment.

For example:

Sensor Index Data	Used to interpret the operating periods of the sensors e.g. to calculate possible target coverage by the chosen sensor.
Segment Index Data	Used to define the position of the data segment within the record.
Event Index Data	Used to interpret the targets/events contained within the preceding segment of imagery data. e.g. target position within the preceding data segment (either on media or previously received via data link).

Table A.2 – Example Postamble Data

Due to the minimal size of the preamble/postamble in comparison to sensor data, it would be advisable to send/record certain tables even though they have not changed, e.g. Mission Data Tables.

A record containing postambles after the data segments may have the format as:

Segment 0
- Preamble files
- End of segment marker

Segment 1
- Data Files
- Preamble files
- Index tables for segment 1
- End of segment marker

Segment 2
- Data Files
- Preamble files
- Index tables for segment 1
- Index tables for segment 2
- End of segment marker

Segment 3
- Data Files
- Preamble files
- Index tables for segment 1
- Index tables for segment 2
- Index tables for segment 3
- End of segment marker

End of Record Marker

A record containing a postamble appended to the preamble may have the format as:

Segment 0
- Preamble files
- Index tables for segment 1
- Index tables for segment 2
- Index tables for segment 3
- End of segment marker

Segment 1

Data Files
End of segment marker
Segment 2
Data Files
End of segment marker
Segment 3
Data Files
End of segment marker
End of Record Marker

A-2 Target Marking and Mensuration

One of the requirements of reconnaissance imagery is to be able to derive target coordinates from the imagery and to make distance measurements on or from the imagery. This is sometimes difficult because imagery has several types of distortions. NATO STANAG 7023 contains the required information to characterise the distortions of the imagery so the imagery interpreter can perform mensuration and target locating from the reconnaissance imagery.

The model presented below is a first order model and does not take first order and second order derivatives into account.

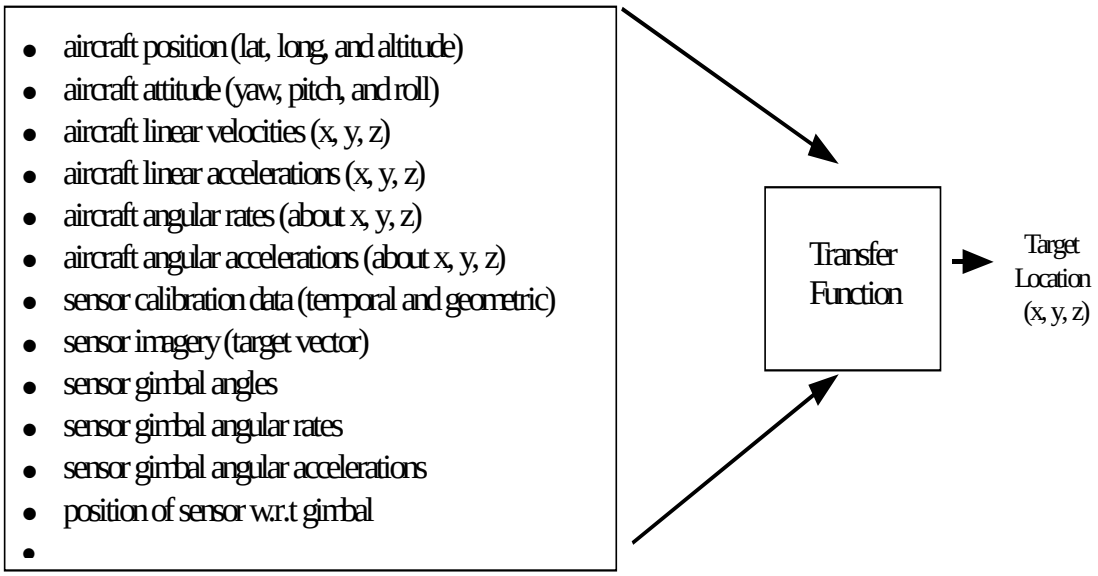

Figure A.1 – Transfer Function

In order to perform target marking and mensuration it is necessary to calculate the sample position vector (or base vector) and look vector for a given sample. This basically gives the position of the centre of optics and a unit vector in the look direction of the sample. If the image samples are transformed for display an inverse transform will have to be applied to the display pixel before performing the following calculation.

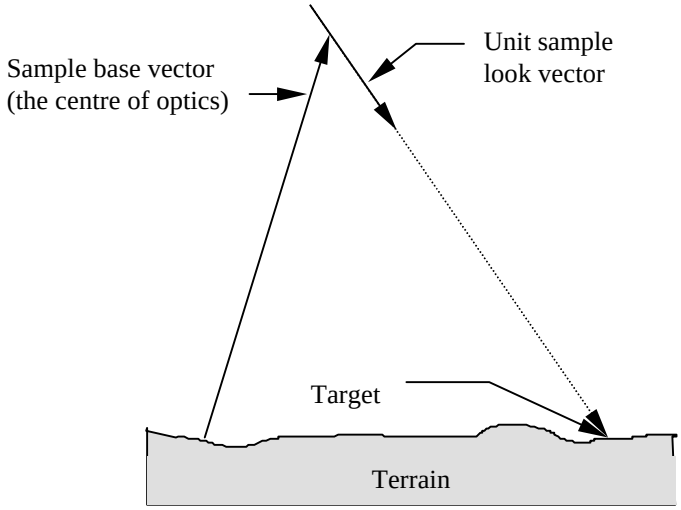

Figure A.2 – Base Vector and Sample Look Vector

Conceptually it is relatively simple to calculate the position of the sensor centre of optics and its look vector, from the platform, gimbals and sensor vectors described above.

$$[R] = [P_p] * [P_A] * [G_{P0}] * [G_{A0}] * \ldots\ldots [G_{Pn}] * [G_{An}] * [S_p] * [S_A]$$

where:

R is the resultant transformation matrix.
P_p is the translation matrix for the platforms position.
P_A is the rotational matrix for the platform. (Roll, Pitch, Yaw).
G_{P0} is the translation matrix for the first stage gimbals position.
G_{A0} is the rotational matrix for the first stage gimbals.
G_{Pn} is the translation matrix for the nth stage gimbals position.
G_{An} is the rotational matrix for the nth stage gimbals.
S_p is the translation matrix for the Sensor's position.
S_A is the rotational matrix for the Sensor.

This can then be used to determine the position of the centre of optics by evaluating the resultant transformation matrix for the Sensors centre of optics (0, 0, 0). This will result in a position vector Rp.

We then take the unit look vector for the sample in which we are interested.

The unit vector for the sensor's centre sample will be (1, 0, 0).

The transformation matrix is then re-evaluated for the unit look vector Rl, of the appropriate sample. The required Resultant unit look vector is then given by (Rl - Rp).

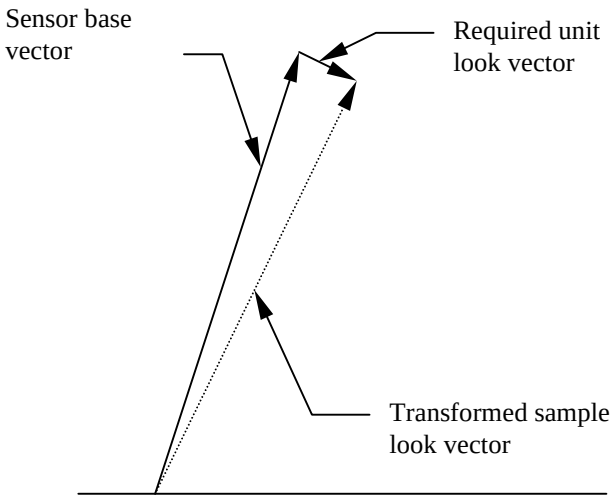

Figure A.3 – Calculation of Base and Sample Look Vectors

In practice the position of the platform is given in latitude, longitude and height. This does not lend itself to the above approach without some modification. Two possible approaches are available:

1. Define a local coordinate system at ground level for the aircraft's lat and long. Then assume a flat coordinate system referencing the platform at (0, 0, height) relative to this coordinate system. Any calculated target position would then be at the aircraft latitude and longitude plus an offset to the target.

2. Reference the aircraft location to the centre of the earth. The aircraft height and the target height can be calculated from the WGS-84 ellipsoid and local terrain data. For this it is necessary to define a world coordinate system and its relationship to latitude, longitude and WGS-84.

A-3 Cyclic Redundancy Check (CRC)

Details and examples of CRC are widely available in open literature. CRC algorithms treat any bit sequence to be checked as a binary polynomial. Given the original bit sequence, the CRC generates a check sequence and appends it to the original. The check sequence is generated so that the resulting bit sequence is exactly devisable by some pre-defined binary polynomial. This pre-defined binary polynomial is called the devisor or CRC polynomial.

Using CRC-16 for 8-bit transmission streams, an extra 2-Byte (16-bit) check sequence, that helps detect bit errors, is appended to the bit sequence to be checked. For the bit sequence represented by the hexadecimal number $(\text{FFFF FFFF FFFF FF01})_{\text{hex}}$, CRC-16 shall calculate a check sequence of 0026_{hex}.

A-3.1 Example Code for Bitwise CRC-16 Calculation

The C-language example code for CRC-16 calculation is provided to enable implementing nations to prove the outcome of other possible CRC-16 algorithms.

The bit shuffling algorithm used is easily implemented and consumes very little memory. However, its time performance is rather poor. The code calculates the CRC-16 check sequence in hexadecimal representation for an arbitrary bit sequence stored in a file, the name of which may be provided as a command line parameter. Other implementations than bitwise CRC calculation are possible. These table-driven algorithms process one byte at a time and are faster than a bitwise implementation. At the same time they consume more memory, as they have to keep tables in memory during runtime.

```
/* Begin of CRC-16 generation code */
/* ------------------------------------------------------ */

#include        <stdio.h>
#include        <stdlib.h>
#include        <string.h>

#define M16     0x8005  /* crc-16 mask */

unsigned short updcrc(unsigned short, short, unsigned short);
void perr(char *);

char            filename[100]; /* test data file name */
unsigned short  crc16; /* calculated crc-16 check sequence */
short                   ch; /* container for one byte of test data */
unsigned int            num; /* number of bytes in the checked test data file */
FILE                    *fp; /* test data file */

main(int argc, char *argv[])
{
        if(argc>2)      perr("Usage:    crc16exe [filename]");
        /* crc16exe represents the name of this executable program file */
        if(argc==2)     strcpy(filename, argv[1]);
        else
        {
                printf("\nEnter filename:  "); gets(filename);
        }

        if((fp=fopen(filename,"rb"))==NULL) perr("Can't open the file");
        num = 0;
        crc16 = 0;

        while((ch=(short)fgetc(fp))!=EOF) /* explicit cast to short */
        {
                num ++;
                crc16=updcrc(crc16,ch,M16); /* Insert the CRC-16 bit mask */
        }

        fclose(fp);
        printf("\nNumber of bytes = %lu\nCRC16 = %04X\n\n",num,crc16);
}

unsigned short updcrc(unsigned short crc, short c, unsigned short mask)
{
        int i;
```

```
        c<<=8;
        for(i=0;i<8;i++)
        {
                if((crc ^c) & 0x8000) crc=(crc<<1) ^mask;
                else crc<<=1;
                c<<=1;
        }
        return crc;
}

void perr(char *s)
{
        printf("\n%s",s); exit(1);
}
/* End of CRC-16 generation code */
```

A-4 Time Gaps

Experiences implementing the standard have shown that the concept of 'no time-gaps' is largely theoretical and in real instantiations of the standard time-gaps do exist. However, every effort should be made not to include gross time gaps.

A-5 Encapsulation

A-5.1 STANAG 4607

GMTI data may be carried in STANAG 7023 through statistical (packet level) multiplexing. The GMTI data should be formatted in accordance with STANAG 4607 and treated as such when de-multiplexed out of the 7023 stream.

A-5.2 STANAG 4609

Motion Imagery data may be carried in STANAG 7023 through statistical (packet level) multiplexing. The motion imagery data should be formatted in accordance with STANAG 4609 and treated as such when de-multiplexed out of the 7023 stream. This is seen as a short-term solution and not the best option for the transportation of Motion Imagery.

Annex B – Interim NPIF Test Plan

B-1 Introduction

B-1.1 Aim

To establish a North Atlantic Treaty Organisation (NATO) Primary Imagery Format (NPIF) Test Plan for achieving and sustaining NPIF compliance by all architectures taking advantage of NPIF.

B-1.2 Scope

This document encompasses the following NPIF testing information:

- Test plan authorities;
- Testing responsibilities;
- Standards document validation test planning/reporting;
- Implementation compliance test planning/reporting;
- Interoperability test planning/reporting;
- Registration of successful test results;
- Reporting problems with NPIF compliant implementations.

B-1.3 Related Documents

NIIA TEPP	NATO ISR Interoperability Architecture Test and Evaluation Program Plan

B-1.4 Referenced Documents

STANAG 7023	NATO Primary Imagery Format (NPIF)

B-1.5 Definitions

B-1.5.1 Validation Test

A test conducted to show that a standard is accurate, complete and understandable.

B-1.5.2 Compliance Test

A test conducted on a single implementation to show that the implementation complies with the provisions of the standard.

B-1.5.3 Interoperability Test

A test conducted on two or more implementations to show whether they can function together in an operational environment.

B-1.5.4 ‘Golden Files’

A set of predetermined compliant data files artificially derived from the NPIF standard. A panel of experts appointed by the NPIF Custodian will validate the files.

B-1.5.5 Full Interoperability Testing

Full interoperability testing requires that all interfaces (e.g. STANAG 7085, STANAG 7024 and/or STANAG 4575), transporting all the types of primary imagery data (sensor and auxiliary) exchanged between the collection and exploitation systems, be tested. This includes the use of actual collection platforms and exploitation systems, containing all their equipment – thus giving a test of the physical layer interfaces specified within the NIIA.

B-1.5.6 Partial Interoperability Testing

Partial interoperability testing only involves testing the NPIF data. Therefore, only systems directly involved with the processing of STANAG 7023 data are required and all other equipment may be simulated. The NPIF data will typically be input/output through the system's interface via CD/laptop.

B-1.6 Applicability

Document validation testing is recommended and conducted at the discretion of the NPIF Custodian.
Compliance testing is **highly recommended** for all systems utilising NPIF and mandatory for compliance registration.
Interoperability testing is **highly recommended** for all systems utilising NPIF.

B-1.7 Test Plan Responsibilities

The following bodies have the responsibility for participating in the NPIF evaluation program.

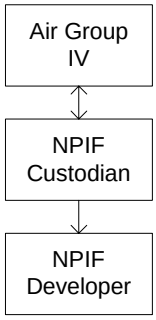

Figure B.1 – Test Program Organisational Relationships

B-1.7.1 NAFAG Air Group IV

AG IV (under the NATO Air Force Armaments Group – NAFAG) manages the 7023 STANAG and related documents though the assignment of a NPIF Custodian.

B-1.7.2 NPIF Custodian

The Air Group IV NPIF Custodian is the delegated NATO authority for the management oversight of the NPIF test program. The testing of the standard is embedded in the development and configuration management procedures that are within the responsibility of the NPIF Custodian. Because of the close relationship of configuration management and testing, the Custodian shall be responsible for the day-to-day oversight of the NPIF test

program and maintaining configuration control of STANAG 7023. This includes the following responsibilities:

- Full authority and responsibility for the management of the NPIF test program;
- Produce and maintain the NPIF Test Program Plan;
- Arbitrate and advise on testing issues and direction;
- Assist in resolving functional and interoperability problems with NPIF compliant implementations.

B-1.7.3 Test Facilities

There is no requirement for a NPIF test facility.

B-1.7.4 NPIF Developer

The NPIF system developers should conduct testing in accordance with the test plan.

B-1.8 Point of Contact

B-1.8.1 NPIF Custodian

See 1.3.1.

B-2 NPIF Test Program

B-2.1 Overview

Figure B.2 gives an overview of the testing process.

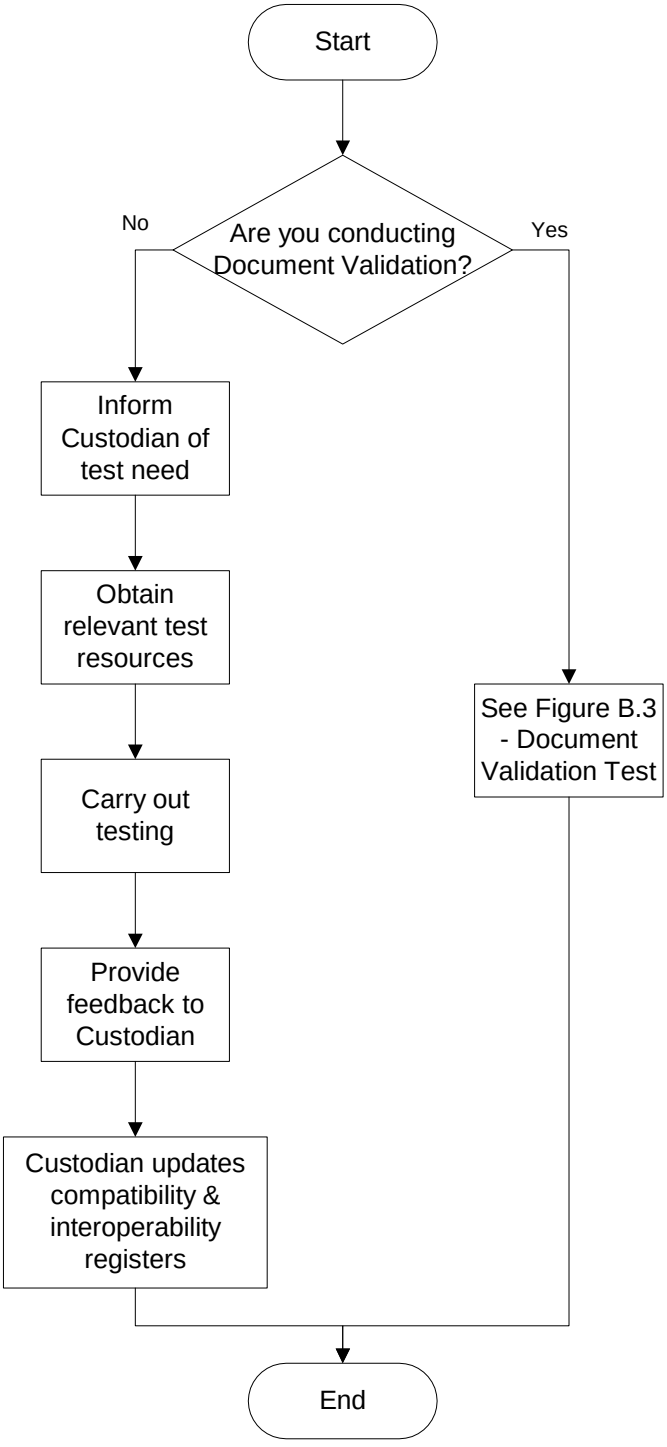

Figure B.2 – Test Overview

B-2.2 Procedure

Any NATO developer of a NPIF system may request testing resources from the NPIF Custodian. The request should be submitted using the 'Test Resource Request Form' [Annex B - Appendix 1], upon acquiescence, the appropriate resources will be allocated to the developer. On completion, results should be submitted to the Custodian using the 'Test Result Feedback Form' [Appendix B –Appendix 1]. The Custodian reserves the right to oversee or independently verify the testing of any NPIF system.

B-2.3 Test Program Responsibilities

B-2.3.1 NPIF Custodian

The NPIF Custodian has the following responsibilities:

- Publish and maintain a master register of NPIF compliant systems;
- Provide developers the necessary resources to test NPIF systems;
- Arbitrate any testing issues from validation or compliance testing.

B-2.3.2 Developer

A developer has the following responsibilities:

- Application for allocation of test resources with the NPIF Custodian;
- Conduct testing;
- Promptly report functional/operational problems experienced with NPIF test resources;
- Submit test results to the NPIF Custodian.

B-2.4 Document Validation Test

B-2.4.1 General

Document validation testing is performed for technical changes to STANAG 7023. Editorial changes do not require validation testing unless directed by the Custodian. An overview is depicted in Figure B.3 - Document Validation Test Overview.

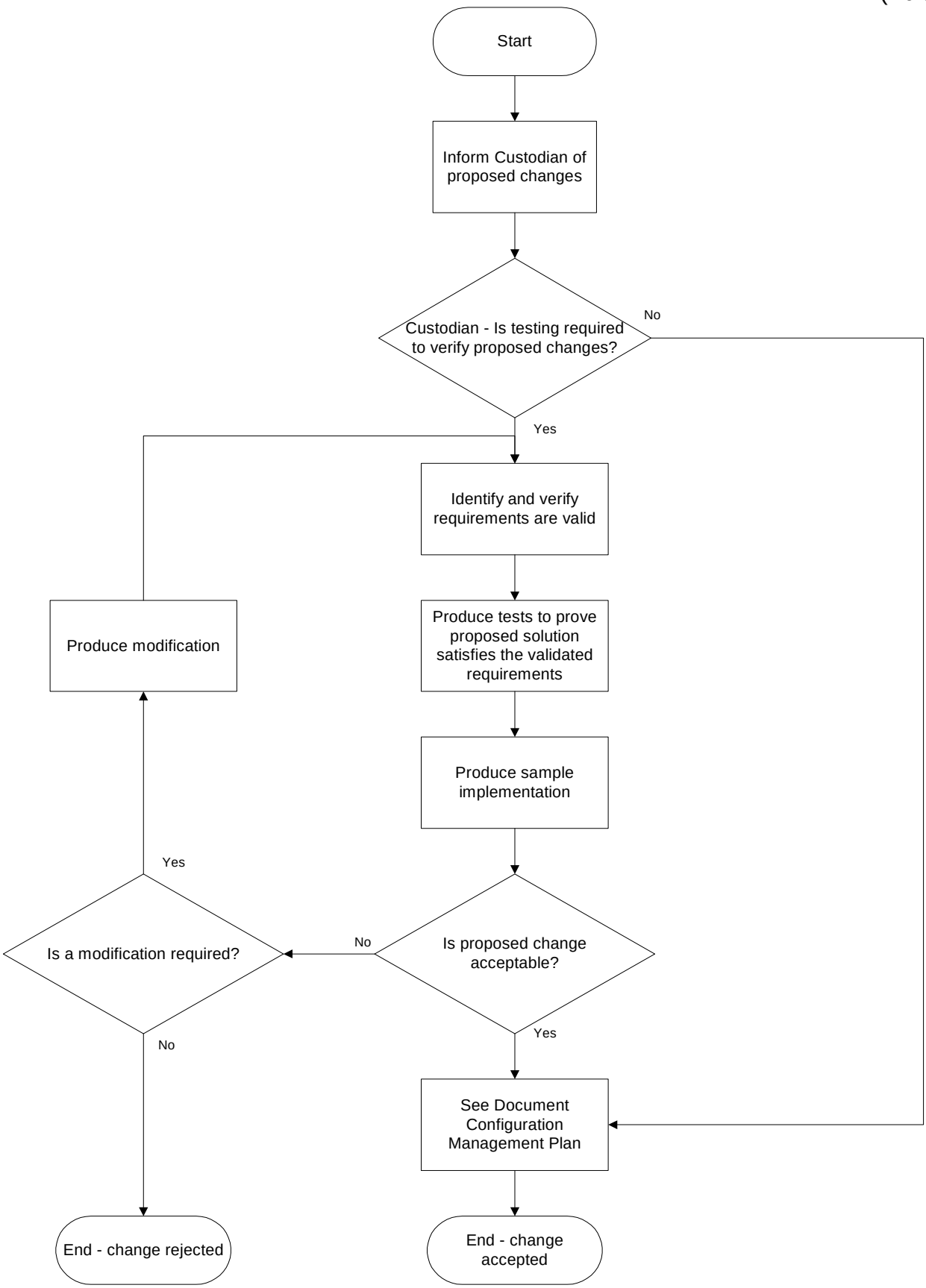

Figure B.3 - Document Validation Test Overview

B-2.4.2 STANAG Change Validation Testing

As changes or additions are nominated to STANAG 7023 CST, they can be validated, if deemed necessary by the Custodian, through testing, prior to approval for incorporation into STANAG 7023. These tests ensure that the changes or additions are technically correct, consistent, complete and testable. In addition, changes to the compliance requirements of the respective test criteria/procedures may be required. Consult the Configuration Management Plan for further guidance.

B-2.4.3 Validation Test Methodology

The process for the validation of proposed changes is listed below:

1. The nation, service, functional and/or performance requirements are fully identified and Custodian ratifies that the requirements are valid;
2. As the proposed change is written, compliance test objectives, criteria, and test cases are also written that will be used to ascertain whether the proposed solution satisfies the validated requirements;
3. A sample implementation of the proposed change should be implemented. The test procedures and tools necessary to conduct compliance testing should also be developed independently of the developer, but in synchronisation with the development of the sample implementation;
4. The compliance test procedures, tools and sample implementation are used to validate the changes to the standard. Based on the review of the validation test results, a modification to the standard or propose change, test criteria, test procedures, or sample implementation may be required. Follow-on testing should be conducted to validate the modification.

B-2.5 Compliance Test

The aim of compliance testing is to promote interoperability through the production of a list of compliant systems.
There are two interfaces where compliance evaluation is required - input (unpacking) and output (packing). Compliance is ascertained through the use of ‘golden files’, where compliance is attained since the ‘golden files’ are 100% compliant with the standard. When packing NPIF data, comparison between the rules for generation of ‘golden files’ and output NPIF data from the system under test validates the data. When unpacking NPIF data, the system must be compliant to interpret the ‘golden files’ input to the system under test.

B-2.5.1 Input of NPIF data

Compliance at the exploitation station is verified using a set of ‘golden files’. The files are input, initially via CD, to the system under test and the results observed at the system’s user interface. The ‘golden files’ consist of a comprehensive range of data types supported by the standard – the system is only required to receive (not process) all data types. Ideally the ‘golden files’ will contain:

EO & IR data for framing, pan, step, linescan and pushbroom sensors	= 10 sets of data
Radar data.	= 1 set of data
MTI data	= 1 set of data
SAR data in spotlight and swath modes.	= 2 sets of data

Data set with CRC errors	= 1 set of data
Encapsulated GMTI (STANAG 4607) data	= 1 set of data
Encapsulated MI data (STANAG 4609) data	= 1 set of data
Range Finder data	= 1 set of data

For each case, both compressed and uncompressed versions are present (where applicable) – resulting in 33 sets of data. The supporting auxiliary data covers a broad range of possible metadata combinations. The process at the receiver for each data set is depicted Figure B.4 – NPIF Input Process). For further information, the latest version of the Golden Files may be obtained from the NPIF Custodian.

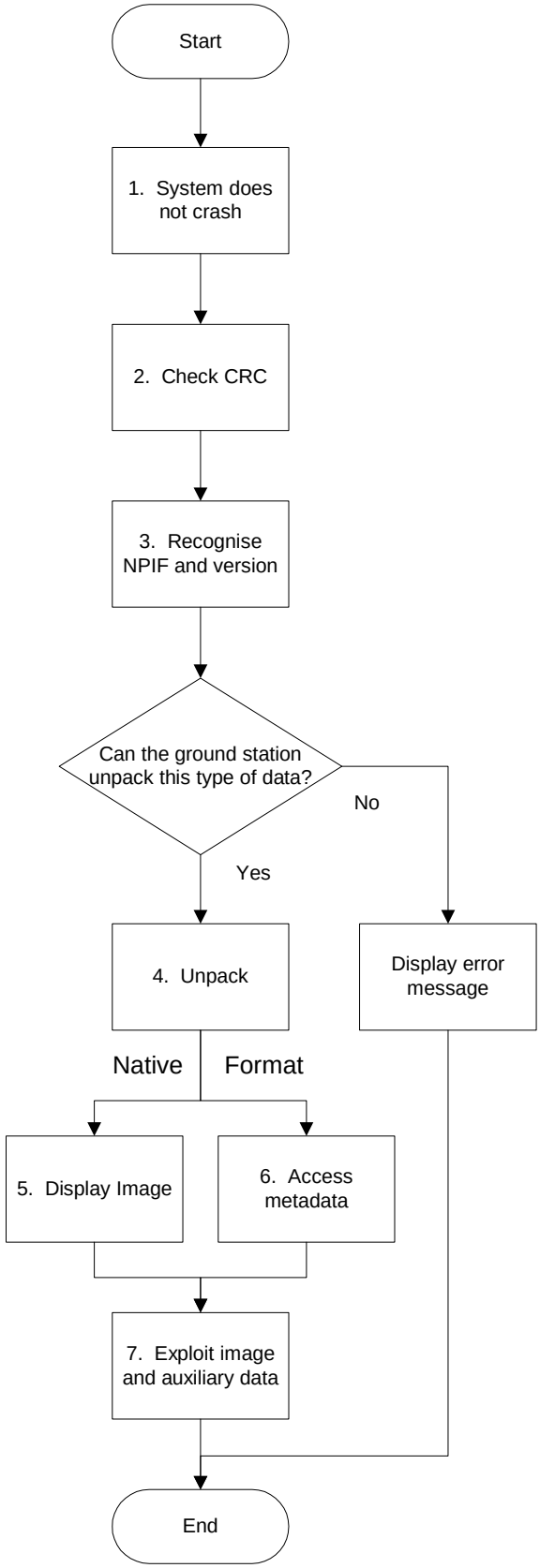

Figure B.4 – NPIF Input Process

To achieve compliance for each data set the receiver must:

1. Flag faulty data.
2. Recognise NPIF data streams.
3. Discount any data streams, without crashing, that are unsupported by the ground station.
4. View sensor data streams supported by the ground station.
5. Provide access to auxiliary metadata.
6. Exploit supported sensor data and associated metadata.

B-2.5.2 Output of NPIF data

The output data stream from the system under test should be recorded to a storage medium for non-real-time processing. Compliance will be tested using an XML parser to verify the data structure is correct, all mandatory data fields are present and all data fields are within their prescribed limits.

B-2.5.3 Test Results

The NPIF Custodian will hold a list of compliant systems.

B-2.6 Interoperability Test

The aim is to produce a comprehensive database of interoperable NPIF systems to promote interoperability.

It is highly advised that interoperability testing should only be conducted with compliant NPIF systems.

The NPIF system owners dictate interoperability testing. However, to further interoperability, as a minimum it is requested that the Custodian is informed of testing and any results deemed pertinent. Additionally, it is recommended that the approach outlined below be considered.

B-2.6.1 Interoperability Testing Approach

Ideally, exhaustive testing of NPIF systems should be conducted, providing detailed technical feedback to engender improved interoperability and awareness within the NATO ISR community. To facilitate this, developers should send sample NPIF data streams on CD, to be held in a library controlled by the NPIF Custodian, from their compliant systems. Consequently, developers can obtain data from the library, through the NPIF Custodian, for comprehensive interoperability testing. Feedback from the testing is returned to the NPIF Custodian for entry into an interoperability database.

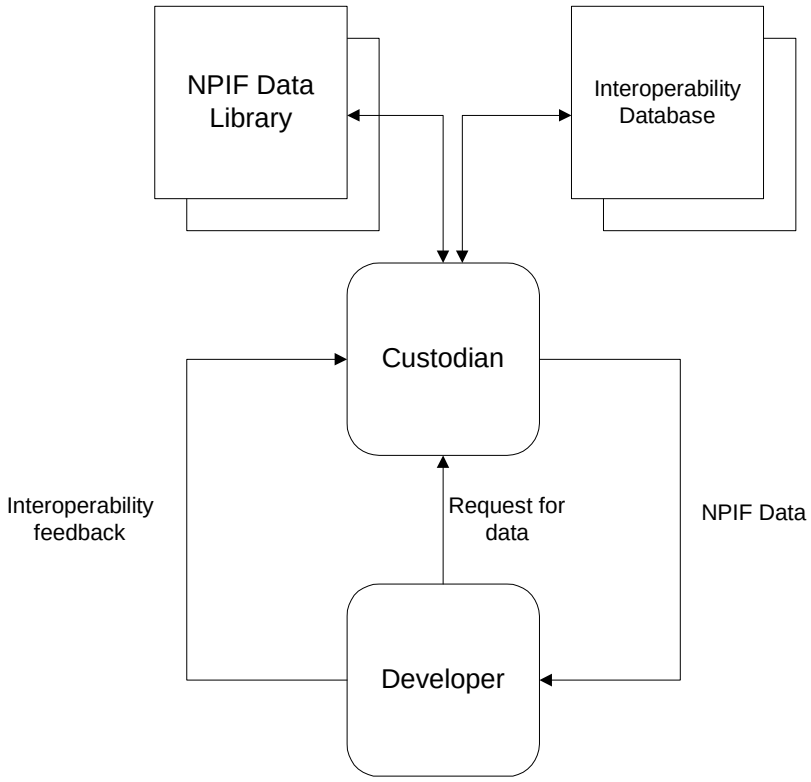

Figure B.5 – Interoperability Overview

B-2.6.2 Interoperability Testing

Interoperability testing may be conducted in two modes – full interoperability testing and partial interoperability testing.

Interoperability testing is normally conducted between two systems (an air platform and a ground station); larger networks of interoperability can then be inferred from the individual tests. In normal operation an air platform operates as a pair with a ground station. For the purpose of the test, one of the systems will be replaced by the system under test. The original equipment (primary configuration) should be used as a control to access the performance of the system under test (slave configuration).

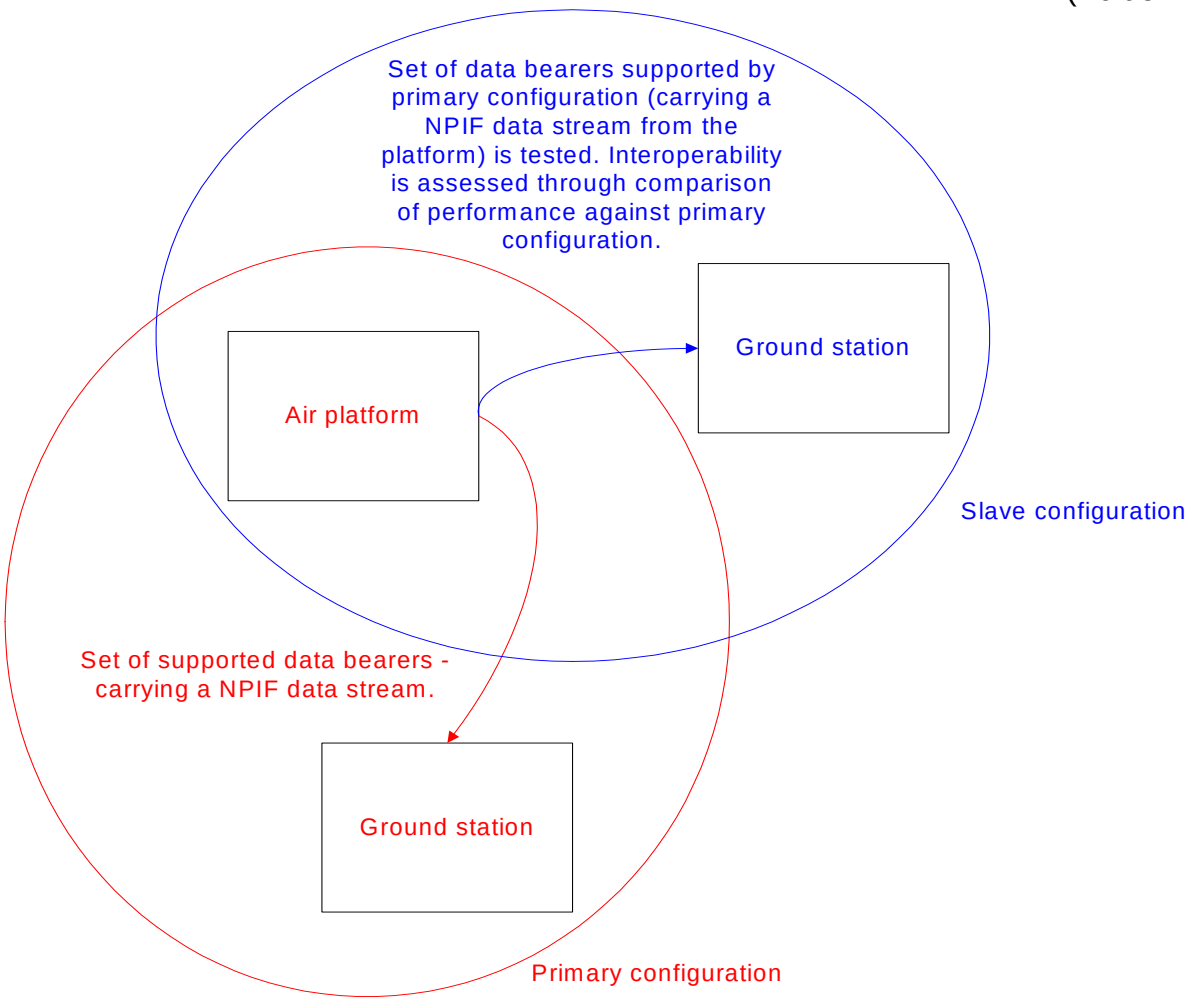

Figure B.6 – Interoperability Test Configuration

[with ground station as the system under test]

The slave configuration should therefore be assessed against the operation of the primary configuration. In order to ascertain the level of interoperability the following questions should be answered for the system under test:

- Does it pack/unpack all the data types (sensor and auxiliary) supported by the primary configuration?
- Does it support compression/decompression for any decompression/compression used by the primary configuration?
- Does it support all the data bearers utilised by the primary configuration (full interoperability testing only)?
- Can it provide all data exploitation capabilities supported by the primary configuration?
- Can it provide the above functionality in a similar time frame to the primary configuration?

Technical feedback and recommendations for future development should be passed to the Custodian.

Annex B – Appendix I
B-I-1 Test Resource Request Form

Test Resource Request Form	
Name of organisation conducting test:	
Address: _____	Name of system under test:
Date of application:	
Testers Name Position	
Type of test required: Output NPIF data stream parser ❑ Input NPIF 'golden files' ❑	
Please use continuation sheet if necessary	

B-I-2 Test Resouce Feedback Form

Test Resource Feedback Form

Name of organisation:

Address: _____

_____

_____

Name of system under test:

_____

_____

_____

Date of testing:

Output of NPIF

Were all mandatory data fields present? Yes ❑ No ❑
Were all relevant data fields in range? Yes ❑ No ❑

Input of NPIF

The system was able to view:

	Without compression	With compression		Without compression	With compression
EO Framing	❑	❑	EO Pushbroom	❑	❑
EO Pan	❑	❑	EO Step	❑	❑
EO Linescan	❑	❑	IR Framing	❑	❑
IR Pushbroom	❑	❑	IR Pan	❑	❑
IR Step	❑	❑	IR Linescan	❑	❑
Radar	❑	❑	MTI	❑	❑
SAR Spot	❑	❑	SAR Swath	❑	❑
Encapsulated STANAG 4607 GMTI	❑		Encapsulated STANAG 4609 MI	❑	
Range Finder data	❑				

Testers

Name	Position	Signed	Date

I confirm that the afformentioned system is compliant with all the relevent sections of STANAG 7023

Named: Signed: Date(DD/MM/YY):

Please use continuation sheet if necessary

Annex C - Configuration Management Plan

C-1 Introduction

C-1.1 Purpose

The purpose of this Annex is to provide the framework for the management of STANAG 7023 and all associated documents.

C-1.2 Related Documents

C-1.2.1 Included Documents

Documents included in this configuration management structure are as follows:

STANAG 7023
AEDP-9, 7023 Implementation Guide
Other as designated by the STANAG 7023 Custodian

C-1.2.2 Other Referenced Documents

AAP-3	*Procedures for the Development, Preparation, Production, and the Updating of NATO Standardisation Agreements (STANAGs) and Allied Publications (APs)*

C-1.3 Points of Contact

C-1.3.1 NPIF Custodian:

See 1.3.1.

C-1.3.2 NATO Air Group IV Secretary

Georges Thibaut,
G.Thibaut@hq.nato.int

C-1.4 Scope

This document provides the framework for configuration management of STANAG 7023 and all associated documents. The participating NATO member nations define their respective levels of participation and all NATO member nations have equal opportunity to have their respective positions voiced in the STANAG 7023 community. Decisions made within this framework are subject to final approval of NATO NAFAG Air Group IV (AG IV), in order to ensure the proper placement of STANAG 7023 within the overall NATO Imagery Interoperability Architecture (NIIA). Overall, the configuration management structure is consistent with the NATO guidelines defined in AAP-3, *Procedures for the Development, Preparation, Production, and the Updating of NATO Standardisation Agreements (STANAGs) and Allied Publications (APs).* The key element of the configuration management process is the management of requests for change by individual nations.

C-2 STANAG Management Organisation

C-2.1 General

C-2.1.1 NATO Nation Responsibility

Each NATO member nation is responsible for funding its own participation. Each NATO member nation can assign representatives to the STANAG 7023 activities, however any assigned representatives are expected to be active participants.

C-2.1.2 Participation Requirements

If the STANAG 7023 Custodian is unable to conduct business due to repeated lack of participation at the meetings, the Custodian shall report the lack of participation to AG IV. AG IV shall request the AG IV representative of the respective nation(s) to either withdraw from STANAG 7023 participation or appoint a new STANAG 7023 representative who will be able to fully participate.

C-2.1.3 Custodian/Chairman

The STANAG 7023 Custodian, or appointed deputy, serves as the chairman for all meetings of the configuration management functions. The Custodian is responsible for all STANAG 7023 activity. Specific duties include, but are not limited to the following tasks:

- Track changes and provide "official" copy of STANAG 7023 for promulgation;
- Report to AG IV on status;
- Chair STANAG 7023 Custodial Support Team (CST) meetings;
- Responsible for Administrative Tasks (detailed in C-2.1.12);
- Assign administrative support as required.

C-2.1.4 Tasking and Reporting Responsibility

The Custodian is the only individual to receive tasking from and report to AG IV on STANAG 7023. This authority can be delegated to other members of the STANAG 7023 community, but responsibility for the tasking and reporting resides with the Custodian.

C-2.1.5 STANAG 7023 Custodial Support Team (7023 CST)

The Custodial Support Team supports the Custodian - providing national perspectives, additional expert advice and counsel on changes to STANAG 7023.

C-2.1.6 STANAG 7023 Representatives

Each national AG IV representative may appoint representatives to the 7023 CST. The name, organisation, address, telephone number, facsimile number and electronic mail address of the appointed 7023 CST member shall be provided to the STANAG 7023 Custodian. (The STANAG 7023 Custodian will document the members of the 7023 CST and provide the information to the AG IV Secretary for recording in the AG IV decision sheet.) The national representative to the 7023 CST can be from government or industry as chosen by the AG IV representative. The national representative to the 7023 CST is the official spokesman for all participants from that nation.

C-2.1.7 National Representative's Responsibilities

Each national representative shall define procedures for establishing the respective national position on proposed changes. These procedures can use whatever process is appropriate to that nation, but ultimately the national representative will voice the official national position to the 7023 CST.

C-2.1.8 National Representative's Delegation Authority

The authority of the national representative can be delegated to another individual from that nation in absence of the national representative. The delegation shall be in writing to the Custodian/chairman prior to the start of the meeting at which the delegation of authority is effective. The substitute representative shall have all authority and responsibility of the regular representative.

C-2.1.9 Other Participation

Other individuals from nations with representatives may participate at the discretion of national representatives or the Custodian/chairman. The participants can be additional government personnel or contractor personnel. The intent of having additional personnel participate is to provide technical, operational, or procedural expertise that may not be resident with the representatives and to allow participation by those who are developing systems using STANAG 7023.

C-2.1.10 AG IV WEB Page

The AG IV Secretary is responsible for maintaining the configuration management of the AG IV web page on which STANAG 7023 is posted. The Secretary will update the postings for past and upcoming meetings based on information provided by the Custodian. Once changes to STANAG 7023 are approved, the Secretary will post the revision to the AG IV web page within 45 days of the meeting, unless other arrangements are agreed during the AG IV meeting. The Secretary will maintain a list of the national representatives to the 7023 CST on the web page, based on the nominations made during the AG IV meetings as documented in the AG IV meeting decision sheets.

C-2.1.11 STANAG 7023 Administrative Support Team

There will be no permanent STANAG 7023 Administrative Support Team. Planning and maintenance activities for STANAG 7023 will be carried out by the Custodian or by staff appointed by the Custodian.

C-2.1.12 STANAG 7023 Administrative Tasks

Administrative tasks include:

- Preparation for the meeting – including identification of location and dates, and preparation of announcements, presentation material and handouts.
- Presentation of recommended changes during the meetings.
- Track recommended changes submitted through 7023 CST channels.
- Prepare minutes of all meetings.
- Prepare revisions for distribution to AG IV secretary and members.
- Perform the configuration management STANAG 7023, including maintaining the current version of document.

- Disseminate all proposed changes to the 7023 CST as they are received and logged.

C-2.1.13 Special Teams

The Custodian has the authority to convene special teams to examine major technical issues beyond the scope of routine change proposal activity. Technical issues of this type may include major changes to the format or development of future strategies for advanced data storage, interface and data download. The Custodian may chair the special team or select another member of the community to chair the special team and report on its progress. The Custodian will appoint the team members (based on the recommendations from the national representatives). The Custodian will identify any special teams to AG IV, detailing the members, tasking, planned schedule and expected products.

C-2.2 Change Identification

C-2.2.1 Change Request Procedure

All representatives can submit change requests to alter the content or structure of STANAG 7023. Other personnel requesting changes shall submit their requests through their national representative. For persons from NATO nations without formal representation on the 7023 CST, the change requests shall be submitted through their respective AG IV representative.

C-2.2.2 Change Request Format

All change requests shall use a standard format, either by completing the form in Appendix 1 or electronic mail containing the same information and order as the form. The paper form can be submitted either through the mail or by telefax. The change request is submitted to the appropriate national representative, who has disapproval authority over any proposed change from their respective nation prior to submission to the Custodian. Upon endorsement the change is forwarded to the Custodian. The Custodian logs the change request and disseminates the proposal for discussion and review if necessary.

C-2.2.3 Class of Changes

All change requests shall identify the proposed change as either Class 1 (amendments of substance) or Class 2 (editorial amendments). Class 1 changes are those identified as changes of substance in paragraph 214.2 of AAP-3 (G) and affect the technical compliance/interoperability requirements of NPIF systems. Class 2 changes are administrative or editorial revisions to clarify the usage of the STANAG; identified as editorial amendments in paragraph 214.3 of AAP-3 (G).

C-2.2.4 Configuration Management

Configuration Management, as defined in AAP-3(G), defines the top-level process. It specifies that once changes are produced, they should be forwarded to the NATO Standardisation Agency (NSA). AAP-3(G) does not specify the process within the sponsoring agency or for the Custodian to use in recording proposed changes and managing the change approval process. The primary purpose of this plan is to specify the process to be used by the STANAG 7023 Custodian.

The STANAG 7023 Configuration Management is conducted at the discretion of the NPIF Custodian. The process is shown in Figure C.1 - Configuration Management Plan. Changes can be submitted at any time and are reviewed by the Custodian. The CST will only be required to agree on Class 1 changes, the Custodian will decide on class 2 changes.

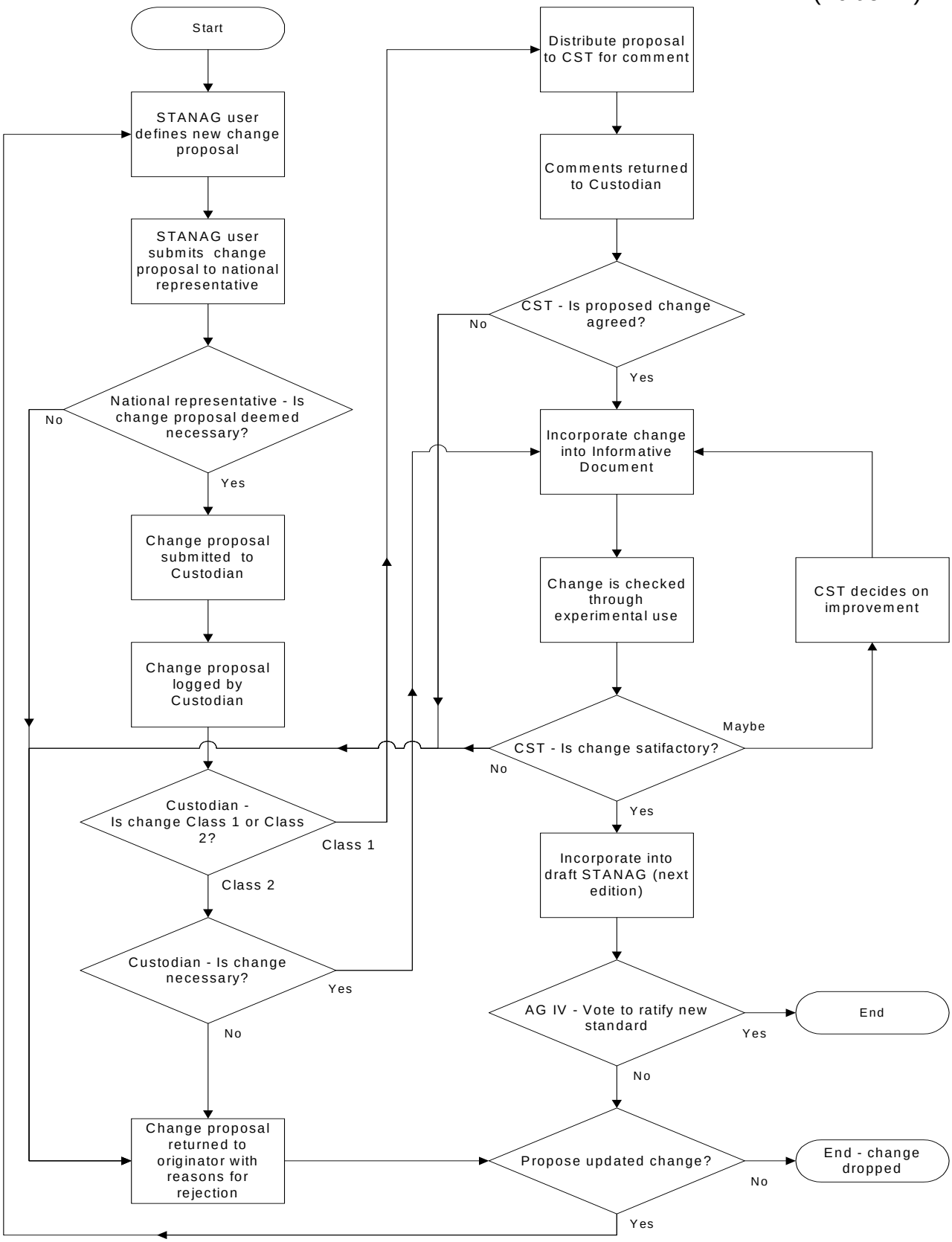

Figure C.1 - Configuration Management Plan

C-2.2.5 7023 CST Meetings

The 7023 CST shall meet as required at the discretion of the Custodian. In lieu of meetings, discussions may be conducted via email or teleconference chaired by the Custodian. Voting may be conducted by postal ballot if the Custodian considers a formal meeting unnecessary.

C-2.2.6 Procedure for Proposed Changes

Proposed changes are compiled and distributed to all national representatives no less than 14 days prior to the meeting. The format of the change compilation is shown in Appendix 2. National representatives then distribute the proposed changes to other interested individuals from the respective nation. National representatives and others are directed to establish impact of the proposed changes. The respective national positions are determined by procedures established by each nation. If a nation is unable to attend a 7023 CST meeting, the nation may submit written comments to the Custodian prior to the 7023 CST meeting. The comments will be provided to all attendees for consideration during deliberations.

C-2.2.7 Discussion of Change Proposals

During the 7023 CST meeting each proposed change is discussed under the Custodian's direction. Change proposals can be deferred pending additional investigation/review (for which the Custodian assigns responsibility for additional study/review) or changes can be voted on (independently or in groups at the discretion of Custodian).

C-2.2.8 Voting on Change Proposals

Only the national representatives vote on final configuration decisions. Class 1 changes require unanimous consent from the national representatives (or designated alternates) in attendance and voting. Class 2 changes may be decided by the Custodian.

C-2.2.9 Custodian's Options and Approval Authority

The Custodian can defer the decisions of the national representatives for AG IV review, request additional discussion and review by the national representatives. The Custodian incorporates approved decisions into the STANAG.

C-2.2.10 Informative Document

The Informative Document is an ongoing record of the changes and enhancements suggested or agreed by the 7023 custodian and the custodial support team. The Informative Document and any associated addendums **are not intended to replace the Ratified STANAG** but to provide intermediate guidance to implementers between the publication of ratified versions of the STANAG. It is a living document and liable to change. To keep track of the document's status, each version will be based on the latest STANAG edition with its status shown by a date group. The date group takes the form as follows: yyyy-mm-dd, thus, 28 February 1998 becomes 1998-02-28. Implementers are advised to check that they are using the latest version.

C-2.2.11 AG IV Meetings

The Custodian presents to AG IV completed amendments to the STANAG along with a summary of the changes for ratification. Revisions with Class 1 changes are then submitted to the AG IV Secretary to formally present the modifications to the nations for ratification.

Revisions with only Class 2 changes are considered ratified with AG IV approval. Regardless of the ratification process used, after ratification, the Secretary posts the revised STANAG 7023 to the AG IV web page and submits it to the Chairman of the MAS for promulgation.

C-2.3 Meeting Procedures

C-2.3.1 Language

All meetings will be conducted in English. Those nations requiring the materials in different languages are responsible for translating the materials.

C-2.3.2 Meeting Advance Notice

All meetings will be announced with a minimum of 60 days notice.

C-2.3.3 Quorum

The quorum for approving changes for submission to AG IV is 2 nations formally represented by approved representatives or their delegates.

C-2.3.4 Meeting Minutes

Minutes of all formal meetings will be distributed within 14 days of the completion of the meeting. The minutes will include a record to document approved and disapproved changes, identify the status of all outstanding changes and highlight issues to be taken forward to AG IV.

Annex C - Appendix 1 - Change Proposal Form

AEDP-9
(Edition 1)

STANDARDISATION DOCUMENT CHANGE PROPOSAL

INSTRUCTIONS

1. Change proposals may be submitted on this form through either mail or telefax, or by electronic mail following the same order and content as this form.
2. Originator completes sections 1-16.
3. Originator forwards to the respective national representative. National representative is official representative to 7023 CST, or if none from the originator's nation, then the representative to Air Group IV. (See the NATO NAFAG AG IV Internet web page for names and addresses.)
4. National representative approves or rejects proposal from their nation by completing sections 17-25.
   - Approved proposals are forwarded to the STANAG 7023 Custodian.
   - Rejected proposals are annotated with the reason for disapproval and returned to the originator.

Note: This form may be used to submit changes to any document included in the STANAG 7023 data set. This form may not be used to request copies of these documents. The documents are available on the NATO NAFAG AG IV Internet home page (www.nato.int/structur/AC/224/home.htm), or through normal NATO document distribution channels.

RECOMMENDED CHANGE: (continue on additional sheets as necessary) page | | of | |

1. Document Number:	2. Document Version/Release Number:	3. Document Date:

4. Document Title:

5. Proposed Change to: (Section, Paragraph, Line, Page)	6. Change Class: I		II	

7. Current Wording:	8. Proposed Wording:

9. Reason/Rationale:

10. Originator's Name:	13. Originator's Telephone Number:
11. Originator's Organisation:	14. Originator's Telefax Number:
12. Originator's Mailing Address:	15. Originator's E-Mail Address: 16. Date Submitted:
17. Nat'l Rep Name:	20. Nat'l Rep Telephone Number:
18. Nat'l Rep Organisation:	21. Nat'l Rep Telefax Number:
19. Nat'l Rep Mailing Address:	22. Nat'l Rep E-Mail Address: 23. Date of Approval/Rejection:

24. Change Proposal: Approved |___| Rejected: |___|
25. Rejection Rationale:

Mail, Telefax, or E-Mail Change Proposals To: STANAG 7023 Custodian	26. Date Logged/initials:

Annex C - Appendix 2 - Consolidated Change Proposal Report Format

CHANGE SUMMARY
Date

Notes:
1) Initials of initiator are shown in Source Column (SRC), and/or next to respective comments.
2) Changes from multiple sources on the same section are shown with the same number and sequential suffix letters in the # column.

#	LOCATION	SRC	OLD TEXT	NEW TEXT	COMMENTS
99-01					
99-02a					
99-02b					