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Section 1 MATERIAL DESCRIPTION & PURPOSE

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| 7. Work Address Code 4353, Bldg. 120-3 JB-MDL, NJ 08733 | 8. Material Title Aerial Refueling Clearance Process Guide |
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9. List all contributing organizations (Programs/Codes/Services) whose subject matter is discussed in this material
NAWCADLKE 4353 and USAF AFLCMC/EZFA.

10. Information Category (Check all that apply)

Brief Documents Thesis Press Release

Video Abstract Photo/Graphics/Display

Other (Specify) _____

Related Contract Number _____

11. Proposed Venue and Date(s), or Publication for which this material has been prepared

The purpose of this generic clearance process guide is to provide a standardized manual for the establishment of technical and operational aerial refueling clearances.

12. Does NAVAIR have primary release authority for this material?

YES If NO, you must identify and obtain Public Release Authorization from the command(s) contributing to this material.

NO

Section 2 REQUESTOR

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REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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|---|------------------|--|-------------------------------------|---|--|
| 1. REPORT DATE 21-08-2014 | | 2. REPORT TYPE Guidance Document | | 3. DATES COVERED 2008-2014 | |
| 4. TITLE AND SUBTITLE Aerial Refueling Clearance Process Guide Attachment: Aerial Refueling Tanker/Receiver Clearance Compatibility Assessment Checklist | | | | 5a. CONTRACT NUMBER N/A | |
| | | | | 5b. GRANT NUMBER N/A | |
| | | | | 5c. PROGRAM ELEMENT NUMBER N/A | |
| | | | | 5d. PROJECT NUMBER N/A | |
| 6. AUTHOR(S) ARSAG Workshop/JSB Working Group 5 Group Lead: Swiderek, Tom Cox, Michael,; Taylor, Chad, Maj.; Benson, David; Choudhury, Farhad; Pasfield, Gregory; Burket, Mark; Tokarz, Joshua; Kalt, Dexter | | | | 5e. TASK NUMBER N/A | |
| | | | | 5f. WORK UNIT NUMBER N/A | |
| | | | | 8. PERFORMING ORGANIZATION REPORT NUMBER ARSAG Document # 43-08-14 | |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Aerial Refueling Systems Advisory Group (ARSAG) Dexter Kalt, Executive Director 1011 Ankeney Road Xenia OH 45385 | | | | 10. SPONSOR/MONITOR'S ACRONYM(S) NAVAIR | |
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| | | | | 12. DISTRIBUTION/AVAILABILITY STATEMENT A. Approved for public release; distribution is unlimited | |
| 13. SUPPLEMENTARY NOTES ARSAG is the DOD Joint Standardization Board (JSB) for Aerial Refueling Systems as chartered by DSPO | | | | | |
| 14. ABSTRACT The Aerial Refueling Clearance Process Guide provides a standardized manual for the establishment of technical and operational aerial refueling clearances. These standardized procedures will facilitate aerial refueling clearances. The Clearance Process Guide is not intended to address initial qualification for tanker or receiver aircraft. It is designed to be applicable to tanker and receiver aircraft operated within the military services and by cooperating and coalition nations, military and commercial aerial refueling services. The processes contained in this document are intended as a guide for multi-national standardization to facilitate clearances between tanker and receiver aircraft not previously cleared for joint aerial refueling missions. The processes are not mandatory and do not supersede national procedures. This document also provides, as an attachment, an aerial refueling tanker/receiver clearance compatibility assessment checklist. | | | | | |
| 15. SUBJECT TERMS Aerial Refueling (AR) Air-to-Air Refueling (AAR) Original Equipment Manufacturer (OEM) Standards Related Document ((SRD) | | | | | |
| 16. SECURITY CLASSIFICATION OF: U | | | 17. LIMITATION OF ABSTRACT UU | 18. NUMBE ROF PAGES 37 | 19a. NAME OF RESPONSIBLE PERSON Farhad Choudhury |
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AERIAL REFUELING SYSTEMS ADVISORY GROUP
AERIAL REFUELING CLEARANCE PROCESS GUIDE

ARSAG Document No: 43-08-14
Date: 21 August 2014



Original Document by:

**ARSAG Workshop / DoD Joint Standardization Board (JSB)
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Distribution Statement

This is an ARSAG Document prepared by a group of international contributors during scheduled ARSAG Workshop Sessions. This ARSAG document is intended to provide guidance derived from lessons learned and offer aerial refueling tanker/receiver interface guidance regarding standardization of aerial refueling systems.

It has been drafted to promote consistent, unambiguous communication among the international aerial refueling community. It does not contain proprietary, sensitive or classified information.

ARSAG documents are not DOD, MOD or NATO standards, but provide guidance regarding aerial refueling systems to United States military services, their allied military organizations involved in aerial refueling and their associated contractors.

Project Worksheet

ARSAG

AERIAL REFUELING SYSTEMS ADVISORY GROUP

AERIAL REFUELING CLEARANCE PROCESS GUIDE DOCUMENT

ARSAG Document No: 43-08-14WD
Date: 21 August 2014
Review (5 year) due date: TBD

ARSAG Workshop / DoD Joint Standardization Board (JSB) for Aerial Refueling Systems

Group # 5
Group Name: AR Procedures and Processes
Group Lead(s): Thomas Swiderek
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and by Group Participants

Project Phases, Reviews

Phase 1: Background, Scope, Purpose, Outline

Group Lead: T. Swiderek, M. Cox, Completion Date: 6 Mar.14

Phase 2: Research and Internal Workshop Coordination

Group Lead: T. Swiderek Completion Date: 6 Mar 2014

Submission to DRT: Date: N/A

Document Review Team Lead: N/A

Completion Date: N/A

Phase 3: Coordination, for Comments External to Workshop

Submission Date: N/A

Completion Date: N/A

Comment Resolution

Group Lead: T. Swiderek Completion Date: 21 Aug 2014

Approval/signed out:

JSB Chair: _____ Date: _____

JSB Deputy Chair: _____ Date: _____

ARSAG Exec. Director: _____ Date: _____

ARSAG Secretary: _____ Date: _____

Phase 4: Publication (as appropriate)

ARSAG Exec. Director: _____ Date: _____

AERIAL REFUELING CLEARANCE PROCESS GUIDE

ARSAG Document No: 43-08-14WD

Date: 21 August 2014

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**PROJECT INITIATION FORM
(PIF)**

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| 2. PROJECT REQUEST | |
| <i>(To be filled out by the requester)</i> | |
| Project Purpose: | <p>Over many years, ARSAG briefings and meetings have provided a forum where individuals identified a distinct lack of international and inter-service aerial refueling clearance guidance and standardization. This shortfall has resulted in wasted hours, excessive cost, delayed clearances, safety concerns and warfighter equipment delays. During a special ARSAG meeting on 8 July 2008 in Washington DC, it was determined that a workgroup would address this situation.</p> <p>This project will provide standardized international recommendations and considerations for the entire aerial refueling clearance process.</p> |
| Proposed Project Title: | Aerial Refueling Clearance Process |
| Product Outcome: (Check One) | <p>ARSAG Document: <input checked="" type="checkbox"/> Guide Document; <input checked="" type="checkbox"/> Recommendation Letter <input checked="" type="checkbox"/> Web Product</p> <p>Input to DoD Standardization Document: <input type="checkbox"/> Specification; <input type="checkbox"/> Standard; <input type="checkbox"/> JSSG; <input checked="" type="checkbox"/> Other</p> <p>Input to NATO Document: <input type="checkbox"/> STANAG; <input type="checkbox"/> STANREC; <input checked="" type="checkbox"/> Allied Publication</p> <p>Input to Industry Document: <input type="checkbox"/> Standard; <input type="checkbox"/> Other</p> |
| 3. PROJECT TIMELINE | |
| <i>(To be filled out by the requester)</i> | |
| Project Request Submittal Date: | Date <u>8 July 2008</u> |
| Requested Completion Date: | Date <u>Oct 2012</u> |
| 4. PROJECT DISPOSITION | |
| <i>(To be filled out by ARSAG, Int'l)</i> | |
| Project Request Receipt Date: | Date <u>July '08</u> |
| Project Disposition: | <p>JSB Chair Approved: Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/></p> <p>ARSAG Exec Director Approved: Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/></p> |
| Priority Assessment: | Priority <u>1</u> |
| Project Number Assignment: | Project Number <u>43-08-08WD</u> |
| Working Group Assignment: | ARSAG/JSB Work Group Number <u>5</u> |
| Response to Project Sponsor or Initiating Agency: | ARSAG Official Response Date <u>July '08 ARSAG International</u> |
| Transition to ARSAG/JSB Working Group: | Date <u>July '08</u> |

AERIAL REFUELING CLEARANCE PROCESS GUIDE

ARSAG Document No: 43-08-14WD

Date: 21 August 2014

Foreword

From its beginning in 1978, a basic element of ARSAG's work has been guidance standards for national and international aerial refueling clearances between tanker and receiver aircraft. In 1981, an ARSAG document identified tanker and receiver aircraft aerial refueling technical and operational characteristics for both the boom/receptacle and probe/drogue methods. This document was titled "Performance and Interface Survey" (P&I). This document and the need for standardized aerial refueling procedures was a high priority for ARSAG work in both our ensuing annual conferences and our workshops. (See Reference Documents listed herein) In 2003, the P&I Survey was revised and updated. The name of the document was changed to Standardized Technical Data Survey (STDS).

Purpose

The Aerial Refueling Clearance Process Guide, ARSAG Document No 43-08-14WD, (Clearance Process Guide) provides a standardized manual for the establishment of technical and operational aerial refueling clearances. These standardized clearance procedures will: facilitate aerial refueling clearances and provide for efficient use of time and resources. However, the Clearance Process Guide is not intended to address initial qualification for tanker or receiver aircraft.

The Clearance Process Guide is designed to be applicable to tanker and receiver aircraft operated within military services and by cooperating and coalition nations, military and commercial services. The processes contained in this document are intended as a guide for multi-national standardization. The processes are not mandatory and do not supersede national procedures.

Tanker and receiver aircraft may have been initially designed and qualified/certified to a set of fuel system and aerial refueling contractual requirements. These tanker aircraft may have been designed and certified to offload fuel to specific receivers. Receiver aircraft may have been designed and certified to download fuel from specific tanker aircraft. This Clearance Process Guide document does not supersede or replace those initial contractual qualifications and certifications. The Clearance Process Guide is designed to facilitate clearances between tanker and receiver aircraft not previously cleared for joint aerial refueling missions.

Scope

The Clearance Process Guide recognizes the requirement for definitive aerial refueling agreements between cooperating agencies, including commercial tanker support organizations, and nations. Aerial refueling support agreements may include monetary agreements, contracted commercial tanker support agreements and contractual tanker support requests from one agency or nation to another agency or nation. The Clearance Process Guide assumes that these agreements will be comprehensive and include the five pillars that are identified strategic requirements to interoperability: they include Technical Compatibility, Operational Compatibility, Minimum Crew Training/Currency, Minimum Maintenance, and Fiscal/Legal Arrangements. The Clearance Process Guide is not intended to include directions for the development or content of these contractual agreements.

AERIAL REFUELING CLEARANCE PROCESS GUIDE

ARSAG Document No: 43-08-14WD

Date: 21 August 2014

Terms and Definitions

| | |
|----------------------------|--|
| A/C | Aircraft |
| AR | Aerial Refueling |
| AAR | Air-to-Air Refueling |
| Tanker Aircraft | An aircraft that carries extra fuel available for transfer to a receiver aircraft through a boom when matched with a receptacle equipped receiver and/or a drogue when with a probe equipped receiver. |
| Receiver aircraft | An aircraft that receives fuel through a receptacle when matched with a boom equipped tanker and/or a probe when with a drogue equipped tanker. |
| AR Boom | Tanker fuel delivery system via telescoping tubes and flying surfaces. |
| Receptacle/UARRSI | Receiver system for accepting tanker boom equipped nozzle. Includes the Universal Aerial Refueling Receptacle Slipway Installation (UARRSI) |
| AR Drogue/Hose Reel | Tanker delivery system via , take-up reel, hose MA 2, 3, 4 coupling and hose stabilizing drogue |
| Probe/Nozzle/Mast | Receiver system for accepting the tanker coupling |
| OEM | Original Equipment Manufacturer |
| SRD | Standards Related Document |

Reference Documents

Compatibility Assessment Checklist with Instructions

Attachment # 1

Standardized Technical Data Survey (STDS), ARSAG Document 17-81-03R Apr '14

Aerial Refueling Test Methods Guide, ARSAG Document 41-09-14WD 6 March '14

Aerial Refueling Pressures Definitions & Terms, Design & Verification Guide,
ARSAG Document 03-00-03R, 21 Sept '10

NATO ATP 3.3.4.5 (STANAG 7191)

NATO ATP 3.3.4.7 (STANAG 7215)

NATO ATP 3.3.4.2 Edition C (formerly ATP-56)

NATO ATP 3.3.4.6 (STANAG 3447 Ed 5) (ratification pending)

1.0 Introduction

An AR clearance is used to document the interoperability of aircraft to safely on-load and off-load fuel to each other in flight. This interoperability must be confirmed and promulgated prior to the platforms performing operational AR. It is important to keep in mind an AR clearance is not a single issue item, but rather the result of a complex process that requires appropriate government authority to examine all applicable technical and operational variables.

It is common for new receiver aircraft to be designed and initially qualified/certified to a set of fuel system and AR contractual requirements based on a specific tanker using a specific configuration. Tanker aircraft are typically initially qualified/certified in a similar manner with a focus on specific fuel system and AR contractual requirements for a specific receiver with a specific configuration. Typically, initial tanker and receiver contractual requirements are unrelated since they are most likely procured at different times, under different contracts, often with different manufacturers, and frequently by different nations.

Since tanker and receiver aircraft are designed independently of each other, the AR systems must be evaluated for key differences that may exist. AR limitations may have to be imposed to mitigate problem areas identified resulting in restricted AR operations. Identified differences may require ground/flight testing with instrumentation to better assess the impact of these differences and minimize restrictions. In some cases, the differences may require tanker and/or receiver AR system or aircraft modifications to achieve the desired compatibility level.

The attached Aerial Refueling Tanker/Receiver Clearance Compatibility Assessment Checklist is provided to assist AR clearance evaluators as they insure all aspects of the AR operation are considered and to assist both the technical and operational agencies in assuring the tanker and the receiver aircraft are compatible for safe AR operations. (See Attachment # 1.)

2.0 AR Clearances

After an assessment of all key variables, an AR clearance is the final determination which defines the authorized conditions that mechanical coupling and AR transfer of fuel can occur between two aircraft during flight. The resultant document should be available for reference by other nations or agencies operating similar aircraft. The AR clearance is promulgated in each Standards Related Document within the NATO Standard ATP-3.3.4.2 Air-to-Air Refuelling, (formerly ATP-56).

Although an AR clearance may already exist between a similar tanker and a similar receiver, it does not mean this existing AR clearance can automatically be utilized by other operators. There are many factors that impact the depth of analysis required to establish an AR clearance in this situation or if the existing clearance is even applicable. Some of these factors include:

- Who is operating the similar tanker/receiver? One nation may operate under very different rules than another.
- Under what guidelines was the first AR clearance produced? The AR clearance could have been approved with a simple hand shake and no assessment.
- Just how similar are the tankers/receivers that are involved? Aircraft are frequently modified over the years and different operators may have made hardware or software changes on the aircraft that would impact an AR clearance.
- Is there a multi-national or user agreement on AR configuration? A trend to help eliminate repetitive AR clearance efforts is to have users agree to keep the AR configuration standardized. This way, the technical compatibility of one operator's aircraft will be fully applicable to all operator's of the same type of aircraft that participate in the agreement.

3.0 AR Clearance Categories

There are three categories of AR clearances depending on the urgency of the AR requirement. The categories are:

3.1 Category 1 AR Clearance

3.1.1 Definition

CAT1 is used when an urgent AR clearance is required due to war, conflict, contingency operation, or other urgent operational needs.

3.1.2 Period

This clearance will have a limited duration of validity. In addition to being withdrawn at the termination of the war, conflict or contingency operation, it is recommended that an expiration date also be included. If the war, conflict or contingency operation continues beyond this date, a review should be initiated in time to extend, cancel and/or modify the clearance. Whenever it is continued, a new expiration date should be established.

3.1.3 Considerations

Due to the urgent timescale, there will be little to no opportunity for testing. Lack of this critical test data will often generate AR restrictions that will be listed in the AR clearance. These restrictions may limit the AR envelop or could restrict the operation of certain systems/equipment during AR. To be able to comply with the urgent situation while maximizing safety, it is essential that there is an open and rapid exchange of information between all agencies. A successful outcome will be enabled by:

- Ready availability and maximum use of applicable technical information including full access to accurate data from all equipment manufacturers. Nations and commercial operators that appoint either the OEM or another representative as the platform engineering authority should confirm that responsibility for engineering related communication has been transferred to that party.
- Ready availability and use of a fully completed Standardized Technical Data Surveys (STDS) for receiver aircraft and tanker aircraft specifying AR method to be used.
- Acceptance that no ground/flight testing or instrumentation will most likely not be performed.
- An early decision as to whether the AR clearance is required for day and/or night AR

3.2 Category 2 AR Clearance

3.2.1 Definition

CAT2 is used when an AR clearance is required due to war, conflict, contingency operation or other operational need but with time available to conduct supplemental testing to reduce restrictions in the AR clearance envelope or reduce limitations that would be imposed on systems/equipment during AR.

3.2.2 Period

This clearance should have a limited duration of validity. In addition to being withdrawn at the termination of the war, conflict, contingency operation, or operational need, it is recommended that an expiration date also be included. If the war, conflict or contingency operation continues

beyond this date, a review should be initiated in time to extend, cancel and/or modify the clearance. Whenever the AR clearance is continued, a new expiration date should be established.

3.2.3 Considerations

CAT2 clearance has many similarities to CAT1 and is expected to be achieved within a limited timescale. When the technical assessment establishes a possibility that the two aircraft or their systems may adversely interfere with each other during AR, ground/flight tests will be conducted to reduce the use of restrictions or limitations on the AR clearance. The cost of these test flights are often paid by the nation or organization requesting the clearance or as mutually agreed.

- Ready availability and maximum use of applicable technical information including full access to accurate data from all equipment manufacturers. Nations and commercial operators that appoint either the OEM or another representative as the platform engineering authority should confirm that responsibility for engineering related communication has been transferred to that party.
- Ready availability and use of a fully completed Standardized Technical Data Surveys (STDS) for receiver aircraft and tanker aircraft specifying AR method to be used.
- An early decision as to whether the AR clearance is required for day and/or night AR

3.3 Category 3 AR Clearance

3.3.1 Definition

CAT3 is used when an AR clearance is required in support of a routine AR requirement as defined by the requester.

3.3.2 Period

The CAT3 clearance can have an open-ended duration of validity, but is subject to review if there are changes impacting key elements of the AR Clearance such as changes in tanker/receiver equipment, visual aids, refueling/mission procedures and more. In addition, it is recommended that all AR clearances be reviewed periodically to ensure currency.

3.3.3 Considerations

Potential restrictions to the AR envelope, as drafted by the evaluating agency, will be identified. The technical assessment identifies situations where the two platforms may adversely interfere with each other during AR. Ground/flight testing will be utilized to eliminate or minimize these restrictions. The cost of these tests will typically fall to the nation or commercial company requesting the clearance, or as mutually agreed. A successful outcome will be enabled by:

- Ready availability and maximum use of applicable technical information including full access to accurate data from all equipment manufacturers. Nations and commercial operators that appoint either the OEM or another representative as the platform engineering authority should confirm that responsibility for engineering related communication has been transferred to that party.

- Ready availability and use of a fully completed Standardized Technical Data Surveys (STDS) for receiver aircraft and tanker aircraft specifying AR method to be used.
- Meetings to involve technical, operational and identified test agencies as well as aircraft hardware manufacturers.
- Completed ground and flight tests with instrumentation as necessary to minimize limitations to the AR envelope and other systems/equipment operation.
- Consensus on AR requirements including whether the AR clearance is required for day and/or night AR

4.0 AR Clearance Pillars

There are five fundamental elements that need to be addressed throughout the entire AR clearance process. These elements are often referred to as the five pillars of an AR Clearance. They include Technical Compatibility, Operational Compatibility, Minimum Crew Training/Currency, Minimum Maintenance, and Fiscal/Legal Arrangements. These pillars are to be thoroughly assessed by both the receiver and tanker nations/organizations during the AR clearance process. These pillars encompass broad concepts to be addressed; however, specific national requirements will take precedence. It is recommended that the impact of these pillars be understood early in the AR clearance process to avoid a last-minute crisis.

4.1 Formalized Request

A formal request for an AR Clearance could be tanker or receiver initiated. The following information is the minimum required to be sent by the requesting agency. The requesting nation/organization should make its request to the agency identified in the other nation/organization's SRD to ATP3.3.4.2. National SRDs should list a formatted letter/example of the requirement based on the asset combination. The below information is an example of, but not limited to, what should be included in the formal request.

- AR Clearance Category sought. (CAT1, CAT2, CAT3)
- Estimated magnitude of support. Location and timeline of support required.
- Operational Mission Requirements
- Type of refueling system involved. (hose/ drogue, boom/receptacle, BDA or all three)
- Type and mark of all aircraft requiring AR. (Can be model IE F-16D, receiver flagged nation)
- Authority for direct contact with receiver and tanker aircraft manufacturers, AR system manufacturers, OEM or others.
- POC of receiver and tanker aircraft and AR system manufacturers, OEM or others.
- Previous AR clearances between the designated receiver and other tankers.
- Fuel type required

NOTE: Submission of previous AR clearances between the specified receiver aircraft and other tankers will provide evidence of previous compatibility assessments, AR envelope parameters, cautions, warnings and

general information that may be of useful in the development of the requested clearance. Also, if the receiver aircraft type is established as having significant technical and operational similarities to those already having an AR clearance, the scope of the AR interoperability assessment may be reduced.

4.2 Technical Compatibility

Safe, efficient AR operations between two aircraft are dependent on their technical compatibility. NATO STANAGs provide standardized specifications for AR equipment. The technical compatibility assessment confirms that the aircraft are able to mechanically couple, off-load or on-load fuel and then decouple without damaging either aircraft or creating an unsafe situation. The technical compatibility assessment is conducted by the engineers of both tanker and receiver aircraft.

Each aircraft owner must conduct an independent technical analysis of the interface between their aircraft and that of the other AR participant to ensure that both meet agreed AR design standards. (Reference NATO ATP 3.3.4.5 (STANAG 7191), NATO ATP 3.3.4.7 (STANAG 7215), NATO ATP 3.3.4.2 Edition C (ATP-56), and NATO ATP 3.3.4.6 (STANAG 3447 Ed 5) and ARSAG Document Ref 03-00-03R.

4.2.1 Standardized Technical Data Survey (STDS)

The questions in the STDS address critical factors involving AR altitude/airspeed capabilities, hardware mating interfaces, structural loads, fuel line pressure capabilities, fuel pressure regulation capabilities, formation aids (lighting /marking, director lights and status lights, rendezvous equipment, including radios, radar, etc.), emergency procedures/engine out capability, redundancy and more.

Even before data has been entered into the STDS, the STDS document can be effectively used as a comprehensive technical and operational tool. It provides the critical questions that must be answered in planning for an aerial refueling mission. It provides an excellent starting point to support a dialog between tanker and receiver aircraft compatibility evaluators.

In an attempt to standardize the AR clearances process and provide a template that details AR equipment data specific to AR-capable aircraft, the Standardized Technical Data Survey (STDS) is included as an attachment to the NATO AAR Clearance Process SRD to NATO ATP 3.3.4.2 Edition C (formerly ATP-56). A properly completed STDS contains both technical and operational tanker/receiver data based on its use of boom/receptacle or probe/drogue AR equipment necessary for the operational compatibility assessment. (Reference STDS)

4.2.2 Technical Airworthiness Regulations

Each nation, service or agency involved will have their own technical airworthiness regulations that form the basis of any technical assessment. These regulations will often specify the background, procedures and requirements for all technical aspects for the aircraft. In most cases they will also identify the position that has the vested authority to approve technical assessments made under these regulations and will provide advice throughout the process. This position is often identified as the Engineering Authority or Chief Engineer for the aircraft.

4.2.3 Technical Risk Analysis

The Technical Risk Analysis will list technical risks that are identified by either of the Engineering Authorities/Chief Engineers. Appropriate national/organizational authorities may assess the technical risk as low enough to choose to accept the condition or they may choose to

mitigate the risk by requesting a test agency conduct applicable ground or flight test activities. The test activities should be specifically designed to assess the identified risk(s) and can provide risk mitigation through design changes or other means. The test activities could also determine the identified risk is acceptable. A report with recommendations will be provided to the engineering authority. This technical risk analysis process provides the first of two risk mitigation loops inherent in the AR clearance process.

4.2.4 Ground and Flight Test

The engineering authority may request a test agency plan and execute ground and/or flight tests to collect data on specifically identified risks with the goal of eliminating or minimizing AR restrictions. This testing often requires instrumentation. The methods and procedures of the tests will be determined by the test agency and agreed to by the engineering authority. They may include simulation and modeling. The scope of ground and flight tests will be in accordance with the type of clearance sought. (Reference ARSAG Test Methods Guide Document DRAFT). A report will be supplied to the engineering authority following analysis of the test data.

4.2.5 AR Envelope Development

A chart depicting altitude and airspeed (equivalent) as a function of gross weight must be submitted and should be a part of the completed STDS. The AR envelopes of the tanker and receiver aircraft can be overlaid and compared at this stage to assist in compatibility assessment. Any operational issues may require further assessment during the operational compatibility assessment.

4.2.6 Technical Compatibility Authorization

When the engineering authorities have completed the technical compatibility assessment and they are satisfied that all risk has been mitigated or are acceptably low risk, a Technical Compatibility Authorization can be issued by letter, memo, message or other means. When used, this authorization is generally endorsed and approved by both engineering authorities and as such is the compliance finding. This technical compatibility authorization can be used as a data baseline with later assessments where similar aircraft from other countries seek AR clearances.

4.3 Operational Compatibility

The operational compatibility of tanker/receiver aircraft will validate the ability of the two aircraft to conduct AR operations safely and effectively in accordance with operational considerations and procedures.

4.3.1 Standardized AR Procedures

ATP-3.3.4.2 covers general operational procedures for AR and national/organizational SRDs cover data and procedures specific to their AR platforms, equipment and procedures.

4.3.2 Operational Compatibility Assessment

An operational compatibility assessment considers operational aspects such as role, configuration, environment, procedures, training and currency. The operational compatibility assessment confirms that the two aircraft being assessed to perform air refueling operations can do so safely and effectively under all operational conditions. A properly completed STDS,

contains vital data relevant to this assessment. The operational compatibility assessment is conducted by the operational command element that operates the aircraft being assessed.

4.3.2.1 Operational Airworthiness Regulations

Each nation, service or agency involved will have their own operational airworthiness regulations that form the basis of all operational activities and assessments. These regulations typically specify the background, procedures and requirements for aircraft operations as well as other operational considerations. In most cases they will also identify the position that has the vested authority to approve operational assessments made under these regulations and will provide advice on the regulations. When used, this position is often identified as the Operational Airworthiness Authority or Operational Commander of the aircraft type.

4.3.2.2 Role, Capability and Environment

The primary assessment components of an operational compatibility assessment are role, capability and environment. If the receiver aircraft introduces a new role, environment or capability to the aircraft type; or a change modifies an existing role, environment or capability such that there is an appreciable effect on aircrew training curriculums, competency management, cockpit workload, and human-machine-interface or flight authorization considerations, a second review must should be accomplished.

4.3.2.3 Operational Risk Analysis

An essential component of an Operational Compatibility Assessment is the Operational Risk Analysis. The analysis will assess operational risks that are identified by either of the Operational Authorities who are usually the operational commanders for the aircraft type. At any point the authorities may assess the risk as low and choose to accept them or they may choose to mitigate identified risk(s) by requesting a test agency to conduct ground/flight test activities. These tests will assess the identified risk(s) and to establish whether any design changes are required or the risk is acceptable. A report with recommendations will be provided to the Operational Authority. This operational analysis process provides the AR clearance process with the second of two risk mitigation loops.

4.3.2.4 Operational Compatibility Authorization

When the operational authorities have completed the operational compatibility assessment, and they are satisfied that all risk has been mitigated or reduced to an acceptable level, then an Operational Compatibility Authorization can be issued. This authorization is often approved and endorsed by both Operational Authorities and, as such, is the compliance finding. This operational compatibility authorization can be used as a data baseline with later assessments where similar aircraft from other countries seek AR clearances

4.4 Minimum Crew Training & Currency

4.4.1 Tanker Aircrew

To be determined bi-laterally. A multinational recommendation is under consideration.

4.4.2 Receiver Aircrew (To be determined)

To be determined bi-laterally. A multinational recommendation is under consideration.

4.4.3 Maintenance Crew (To be determined)

To be determined bi-laterally. A multinational recommendation is under consideration.

4.5 Minimum Maintenance

Minimum maintenance requirements are currently based on bilateral agreements however a multinational minimum recommendation is under consideration. Some of the items to consider include fuel pressure regulation and the functionality of the AR equipment.

4.6 Fiscal/Legal Arrangements

Fiscal and legal arrangements are a critical component of being able to conduct AR operations. Although these items are typically bilateral in nature, it is recommended that these issues be addressed early in the AR clearance process. Many of the required agreements can take many months to years to put in place. Some of the key fiscal issues relate to how payment for flight hours and fuel will be handled? How will transit time or loiter time be paid for if conducting operations with numerous nations? Compensation for services can be done using multinational/bi-lateral agreements such as the ATARES Agreement, cross servicing agreements, replacement in kind agreements, Foreign Military Sales agreements, or with cash transfers. Some key legal issues related to liability in the case of an accident or incident. Third party liability. Status of Forces Agreements. Bi-lateral or multi-lateral agreements. SPINS or operations plans for specific theaters of operation.

5.0 Activity Approval

5.1 AR Clearance Authorization

The AR Clearance Authorization (ARCA) is the final set of documents that provides command authority for an AR clearance between two aircraft. This authorization specifies the type of clearance. It includes all necessary details of the clearance including standard coupling equipment specifications as well as any identified additional restrictions, cautions and warnings other than those found in the National SRDs to ATP-3.3.4.2.

5.2 Cautions and Warnings

The ARCA will defined warnings and cautions for both the tanker and receiver.

5.3 General Information

Any additional relevant information on the aircraft, procedures or the AR clearance will be included in the ARCA.

5.4 Associated References

Any other relevant documents to the AR clearance will be listed. References such as other existing clearances will provide additional information to support the clearance.

5.5 AAR Clearance Matrix

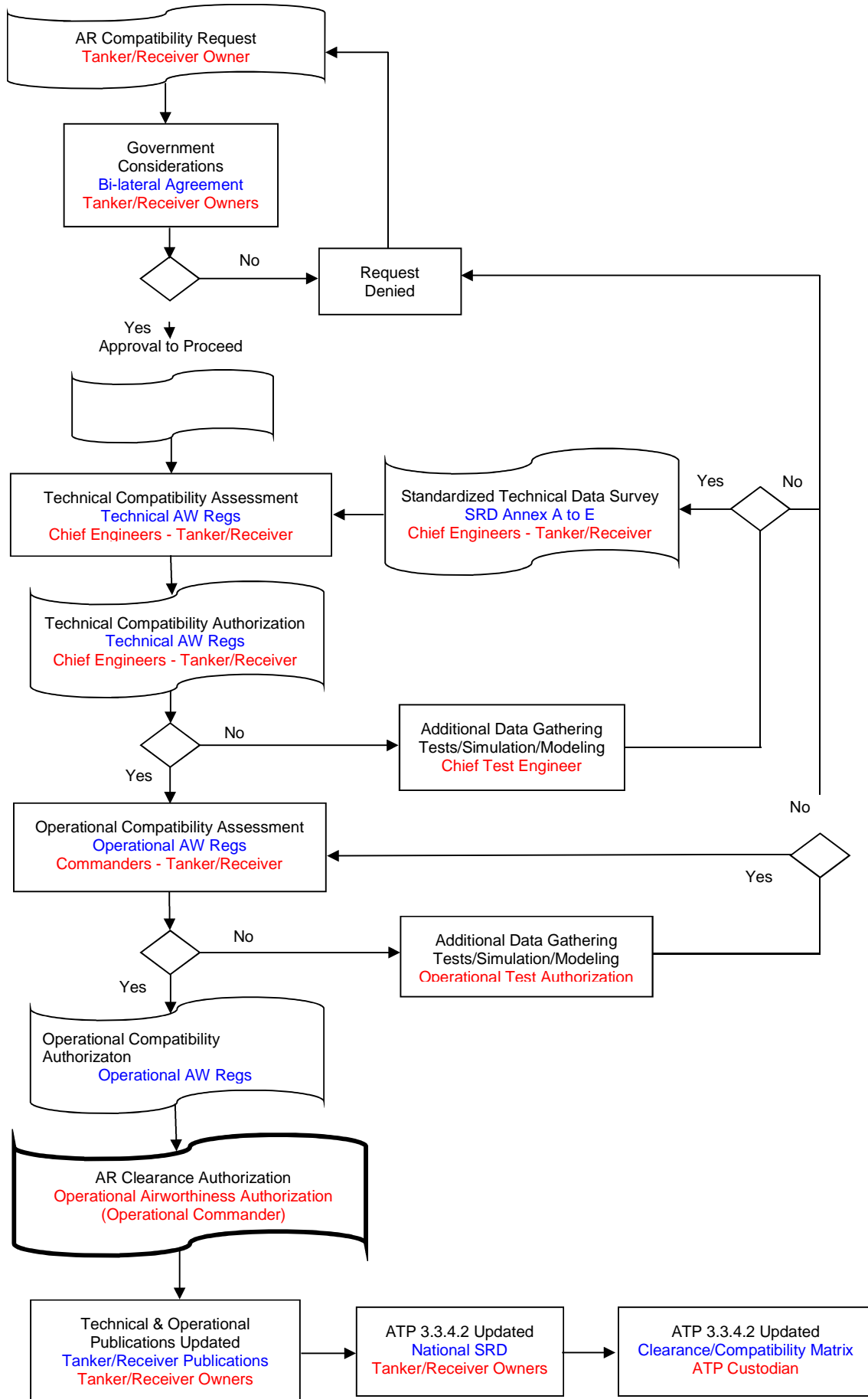
ARSAG documents are available through ARSAG at arsaginc@earthlink.net. Additional ARSAG information is available on line at www.arsaginc.com.

Nations, Operators, or their designated representatives should provide all publically releasable ARCA source documentation to include any technical or operational compatibility authorizations to the JAPCC for inclusion in and update of the NATO AAR Clearance Matrix. Information that is not publically releasable (up to NATO Secret) can be sent to the JAPCC via the appropriate secure means. This info will be stored appropriately and released only to those who have proper access. The JAPCC AAR Section can be reached via email at aar@japcc.org.

Clearance Process Guide Flow Chart

The flow chart on the following page is intended to provide an example clearance process that would need to be tailored to meet specific national or organizational requirements. It is intended to highlight critical decisions points and key positions to facilitate a streamlined clearance process. See flow chart following.

AR Compatibility Assessment Process



**Aerial Refueling Tanker/Receiver Clearance
Compatibility Assessment Checklist**

Aerial Refueling Tanker/Receiver Clearance Compatibility Assessment Checklist Instructions

1.0 Purpose:

Instructions and guidance for use of subject checklist, as related to below references.

2.0 References

- 2.1 Standardized Technical Data Survey (STDS), ARSAG Document 17-81-03R, April '14
- 2.2 Aerial Refueling Clearance Process Guide, dated 22 August '14 DRAFT
- 2.3 Test Methods Guide doc no.41-09-14WD dated 22 July '14 DRAFT
- 2.4 AR Tanker/Receiver Clearance Compatibility Assessment Checklist for Boom/Receptacle, Probe/Drogue, and Boom-to-Drogue Adapter (BDA) Kit Method dated 21 Jan.13_rev. 7 22 July '14.

3.0 Instructions

3.1 Document Description

- 3.1.1 The checklist is prepared to insure all aspects of the aerial refueling operation are considered and to assist both the technical and operational agencies for assuring the tanker and the receiver aircraft are compatible for safe aerial refueling operations. The category level 1, 2, or 3 is to be specified by the requesting agency. These 3 levels are described in reference 2.2 above, Paragraph 3.0 ., Categories1., 2. and 3.
- 3.1.2 The chart provides for assessment items for the three aerial refueling methods, Boom/Receptacle, Probe/Drogue, and BDA Kit.
- 3.1.3 The items for assessment consideration cover several areas of interface for both the tanker and the receiver aircraft. Some items apply to the tanker/receiver direct interface system and others are peculiar to each aircraft as designated.
- 3.1.4 Evaluation Assessment: The evaluation assessment covers normal system functions, analysis, STDS questions completed, contractor data (interface documents), similarity claims to previous testing/analyses, restrictions, laboratory, and ground and flight tests with and without instrumentation.
- 3.1.5 Category 1 Evaluations: It can be noted that since Category 1 is an urgent requirement, actual testing may not be possible and therefore the evaluation assessment will necessarily be restricted to existing data obtained from contractor interface data and the STDS questionnaire (contractor technical documents etc. type data). In some cases similarity to other A/C may be used. Functional checks of all aerial and fuel systems should be a mandatory check as appropriate. The Category 1 should utilize AR restrictions when substantial technical/test data is not available. This could include fuel top-off restrictions (over pressure concerns), limited AR speeds and altitudes. When ground support equipment (GSE) is available it should be used to its fullest, for functional A/C systems checkout.
- 3.1.6 Category 2 Evaluations: This category of clearance evaluation may be required when an AR operational need is not urgent and some time and resources are available for testing. In Category 1 AR restrictions may have been necessary. In order to remove or mitigate these operational restrictions, laboratory, ground, and/or flight testing may be possible during the Category 2 evaluation. Also, instrumentation may be necessary to provide quantitative data to verify design capability, i.e. probe strength, closure speeds, and/or boom pullout loads to ensure structural integrity. Actual ground tests with tanker to receiver hookups may be necessary during

this phase. This category is used when some AR restrictions are permissible but the AR operational usage is low. Data retained from the Category I clearance may be valuable for use during the Category 2 evaluation.

- 3.1.7 Category 3 Evaluations: When an organization plans to do AR operations on a routine, ongoing basis a full tanker/receiver clearance should be sought. This AR clearance may require considerably more testing & instrumentation to minimize AR restrictions. It should be point out that if the tanker/receiver combinations have previously been cleared for Category 1 and/or 2 evaluations that data & records should be maintained and may be useful in the category 3 full clearance evaluations and minimize re-evaluations.
- 3.1.8 General: various methods of symbology may be used to fill in the square spaces after each assessment item. Examples are as follows:

(#): Complied with
N/A: Not applicable
N/O: Not obtainable
S/A: See Attached

Notes:

1. The evaluators of both the tanker and receiver for the clearance process should review the checklist items and identify other areas as needed that should be added to the list considering their particular aircraft and its aerial refueling capability for tanker/receiver compatibility.
2. The first column on the left side of the checklist chart should be completed by the evaluators using the Standardized Technical Data Survey (STDS) to fill in the appropriate paragraphs for each assessment item being evaluated. Likewise the second column from the left side of the checklist chart should be filled in using ARSAG "Test Methods Guide" document doc no.41-09-14WD dated 22 July '14 DRAFT for the appropriate assessment item being evaluated.
3. It should be noted that the first column in the checklist addresses the functionality of the aerial refueling systems. Ground support equipment (testers) should be used to verify that all systems are in a "GO" condition before any aerial refueling missions are initiated.

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|--|---|----|---|----|---|-----------------------|---|----|---|----|---|-----|-----------------------|---|---|----|---|--|---|------------------|--------------------------|-----|
| | DHK ARSAG DOC. Org. 6Dec. 13 | Aerial Refueling Tanker/Receiver Clearance Compatibility Assessment Checklist | | | | | | | | | | | | | | A - Analysis C - Contractor Data Fu - Functional Ft - Flight Test G - Ground Test | | | | /I - Instrumentation Req'd L - Lab Test R - Restrictions St - STDS Si - Similarity | | | | |
| | Revised : 21Jan 14 | | | | | | | | | | | | | | | | | | | | | | | |
| | Revised 19 Aug '14 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Item | | Category 1 | | | | | | Category 2 | | | | | | | Category 3 | | | | | | | ARSAG STDS Para. | ARSAG Test Methods Para. | |
| Pg. | Tanker/Receiver A/C | Evaluation Assessment | | | | | | Evaluation Assessment | | | | | | | Evaluation Assessment | | | | | | | | | |
| | Probe/Drogue Method | Fu | A | St | C | Si | R | Fu | A | ST | C | Si | R | G/I | F/I | Fu | A | St | C | Si | R | | | G/I |
| 1.0 | Airspeed/Altitude Env | | | | | | | | | | | | | | | | | | | | | | | |
| | 1.1 Tanker | | | | | | | | | | | | | | | | | | | | | | | |
| | 1.2 Receiver | | | | | | | | | | | | | | | | | | | | | | | |
| 2.0 | Hose/Drogue Location & Hose Envelope | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.1 Tanker Deployed Hose Length | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.2 Fuselage C/L Mtd. | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.3 Fuselage Off Center | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.4 Wing Mounted Pod | | | | | | | | | | | | | | | | | | | | | | | |
| 3.0 | AR Fuel Type | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.1 Tanker | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.2 Receiver | | | | | | | | | | | | | | | | | | | | | | | |
| 4.0 | AR Fuel System | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.1 Press./Flow Curve T. | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.2 Press./Flow Curve R. | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.3 Surge Protection T. | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.4 Surge Protection R. | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.5 Press. Regulation T. | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.5.1 Press. Reg. On Board | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.5.2 MA-3 Coupling | | | | | | | | | | | | | | | | | | | | | | | |

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|-----------------|----------------------------------|--|---|----|---|----|---|-----------------------|---|----|---|----|---|-----|-----|---|---|----|---|--|---|-----|-----|------------------|--------------------------|
| | DHK ARSAG DOC. Org. 6Dec. 13 | Aerial Refueling Tanker/Receiver Clearance Compatibility Assessment Checklist | | | | | | | | | | | | | | A - Analysis C - Contractor Data Fu - Functional Ft - Flight Test G - Ground Test | | | | /I - Instrumentation Req'd L - Lab Test R - Restrictions St - STDS Si - Similarity | | | | | |
| | Revised : 21Jan 14 | | | | | | | | | | | | | | | | | | | | | | | | |
| | Revised 19 Aug '14 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Assessment Item | | Category 1 | | | | | | Category 2 | | | | | | | | Category 3 | | | | | | | | ARSAG STDS Para. | ARSAG Test Methods Para. |
| Pg. | Tanker/Receiver A/C | Evaluation Assessment | | | | | | Evaluation Assessment | | | | | | | | Evaluation Assessment | | | | | | | | | |
| | Probe/Drogue Method | Fu | A | St | C | Si | R | Fu | A | ST | C | Si | R | G/I | F/I | Fu | A | St | C | Si | R | G/I | F/I | | |
| | 10.4 Mil-PERF-81975C Coup. Spec. | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10.5 Joint Services Guide Doc. | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10.6 MIL-N-25161 Nozzle Spec. | | | | | | | | | | | | | | | | | | | | | | | | |

