



Towards Creating a NATO Standard Methodology for Assessing Multinational Interoperability: A Canadian Perspective

(UNCLASSIFIED)

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Outline

- What is SAS-156
- Relationship to other activities
- Canadian context
- Preliminary findings
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Developing a Standard Methodology for Assessing Multinational Interoperability (RTG SAS-156)

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Authorized	STOEOP NZL
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Objectives: To develop and demonstrate value of a NATO standard for interoperability data collection and assessment.

Topics:

- 1) What is the current state of data collection and management with respect to interoperability within NATO?
- 2) What best practices concerning interoperability data collection and management for analysis are suitable for adoption throughout NATO?
- 3) What are the data elements which make up communications interoperability observations and are common across NATO partners?

Exploitation

This research will help NATO move towards a standard for interoperability data definition, collection, and management. If successful, the proposed methods would allow military planners to better understand their state of interoperability with their partners, and discuss those assessments in a common manner among them. Additionally, these assessments would inform resourcing decisions of individual nations, pursuing their own interoperability objectives.

Status and Comments:

A number of gaps in domain and experiences were identified. The next virtual check-in and another short virtual meeting may be scheduled for April. The next virtual check-in meeting will be 23 March, likely Q1 or Q2 of 2022.



Relationship to other activities

- Intent to standardize the *assessment of interoperability*, not to create interoperability standards or to achieve a specific interoperability goal
 - As distinct from e.g., Federated Mission Networking initiative
 - While it could inform progress against plans and roadmaps, is not a plan in and of itself
 - Could be applied at existing interoperability exercises/experiments, operations
- May build on/take inspiration from the U.S. Army Interoperability Measurement System (AIMS), itself based on a U.S. Center for Army Analysis prototype
 - Also being considered by Aus/Can/NZ/US/UK Armies (ABCANZ)
- NATO ACT's Interoperability Verification & Validation director identified as possible custodian of the results



Canadian context

- Prep work with the Canadian Army/ABCANZ for Joint Warfighting Assessment (JWA) 2020, where AIMS and other tools were to be evaluated (disrupted by pandemic)
- Embedded with the Canadian Joint Operations Command (CJOC), which leads most Canadian operations globally, e.g.:
 - Canada as Framework Nation for NATO enhanced Forward Presence battlegroup Latvia
 - Participation in the Multinational Joint Commission in Ukraine
 - Periodic leadership of Combined Task Force 150
- CJOC maintains a Joint Task List similar to the U.S. and NATO, which includes multiple elements of interoperability, both explicitly and implicitly
- Canadian understanding reflects NATO terminology of technical, procedural and human *dimensions* of interoperability – includes what nations *actually* do together, not just what they can or could do



Preliminary findings



Granularity of interoperability

- Organizational level (nations/units/forces/commands/formations/units)
 - Certain units in two nations may work together all the time, but does their level of interoperability truly reflect nation or force level interoperability?
 - Even forces or units within a nation may have interoperability challenges
 - Small/medium-sized nations may not resonate with force level assessments
 - Ideally a framework should allow for questions like “how interoperable are Country A’s fighter aircraft with Country B’s joint terminal attack controllers?”
- Measurement scales
 - Broad scales like “not interoperable,” “deconflicted,” “compatible,” and “integrated” paint a broad picture, but will gloss over more specific challenges
 - Inter-rater reliability is always an issue, but particularly when levels are broad



De Jure and De Facto interoperability

- It is one thing for policy/procedures to allow *de jure* interoperability, and another to have the practical *de facto* ability to do so
- All the standards and agreements may be in place, but lack of training, experience or other human factors may prevent effective interoperation
- Conversely, units that do not have an official relationship may nonetheless be able to interoperate effectively when the situation demands
 - “Interoperability is valuable as a means to an end, not as an end in and of itself. Interoperability is only beneficial for what it allows multinational forces to accomplish” [1]
- De jure interoperability may be more important to a treaty organization like NATO, while de facto interoperability may be all that is necessary or indeed desirable in other situations
- In both cases, a standardized assessment framework should be built to assess what *is*, rather than define what *ought* to be



Pair-wise versus collective/standardized interoperability

- Why not just aim to implement every STANAG, and measure against that?
 - Can never be complete enough for conformance to directly imply interoperability
 - Nations have other allies and partners with whom they have interoperability goals
 - Some nations have particularly close relationships or use common hardware, so they may have a higher level of interoperability than the NATO standard
- Other motivations for pair-wise assessment
 - Interoperability may not be commutative – e.g., Country A operates both Link 16 and 22, so can talk to Country B on 16 and Country C on 22, but B can't talk directly to C
 - Nations may be sensitive to an 'assessment' being understood as a measure of quality, so broad sharing of results of all nations against a 'standard' may become sensitive
- Having a standard language and format is still useful for when countries are prepared to share, but does not require every assessment to be widely shared



Simplicity, Ease of Use, Reliability and Validity

- While there are benefits to keeping any system simple, especially for use in the field, there are trade-offs to reducing complicated topics to dichotomous (yes/no) or ordinal scales
- If the results (aggregated or not) are unreliable, can put the whole assessment process into a “failure cycle” where the results are not valued, and the process is abandoned
- The literature on military assessment, including the NATO handbook, notes that simple scales lead to questions that require narratives, and that “smart staffs often provide such narratives anyway” [2] – understanding the why/root cause more important than the level
- Aggregation can be messy – if Units A-1&B-1 work well together, as do A-2&B-2, but A-1&B-2 and B-1&B-2 don't... how does this roll up to A and B working together?
- Key challenge for SAS-156 is to craft a framework with adequate qualitative detail, without reducing to a totally unstructured narrative that cannot be standardized



Expecting the unexpected

- Only constant in life is change
- Building a framework around today's five or ten-year goals is unlikely to be robust for even that long
- In military circles, not even the goals but the groupings of functions, dimensions and elements tend to change over time, and are rarely consistent between nations and alliances
- Crises bring unexpected interoperability items to the fore – e.g., end-of-tour testing protocols for COVID-19 varied by nation
- Almost by definition the newest capabilities are unlikely to have standards, so need to be able to add, subtract, and re-arrange assessment items



Conclusion

- While at an early stage, key aspects of an acceptable standard coming into view
- Sufficient granularity needed for it to be of use to smaller nations and to assess the interoperability of specific types of units
- Both policy and practical concerns need to be included
- Both pair-wise and group-wise assessments are valid use cases, including pairing with nations outside of NATO
- While keeping it simple, need to leave room to describe problems sufficiently to allow them to be understood – and hopefully solved
- As with any military capability, an assessment framework will require adequate training in its use