MSIAC
Munitions Safety Information Analysis Center

Supporting Munitions Safety

MSIAC

Highlights and Future Priorities

Dr Michael Sharp
MSIAC PM
m.sharp@msiac.nato.int

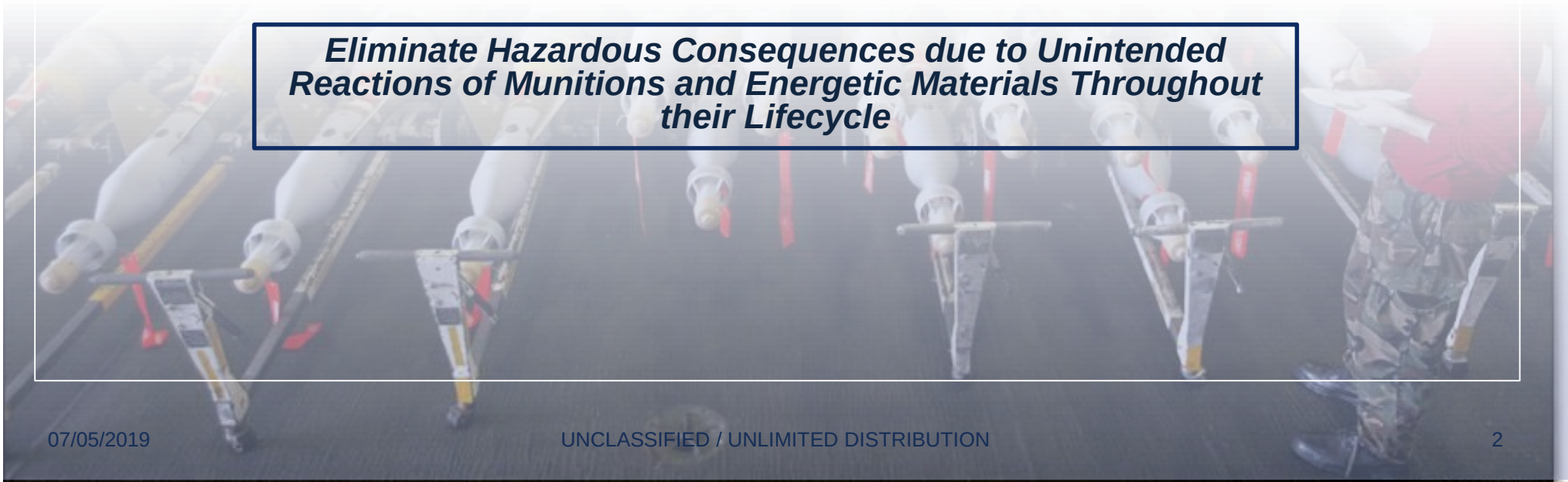
MSIAC

Technical Information & Analysis Center Focusing on Munitions Safety

- NATO Project Office
- Independently Funded by its Member Nations

MSIAC Strategic Goal:

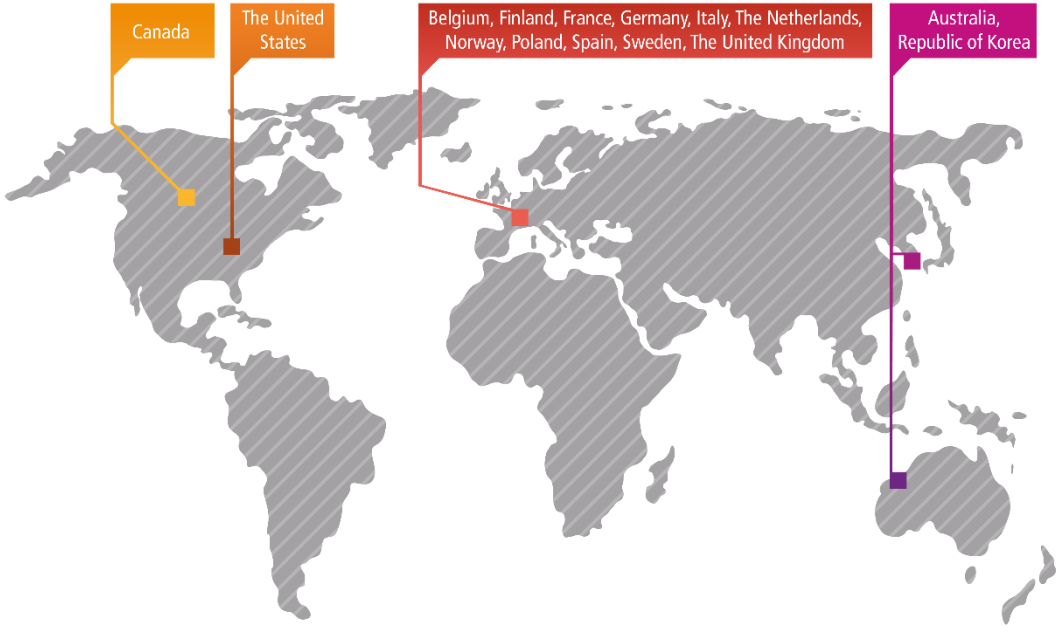
Eliminate Hazardous Consequences due to Unintended Reactions of Munitions and Energetic Materials Throughout their Lifecycle



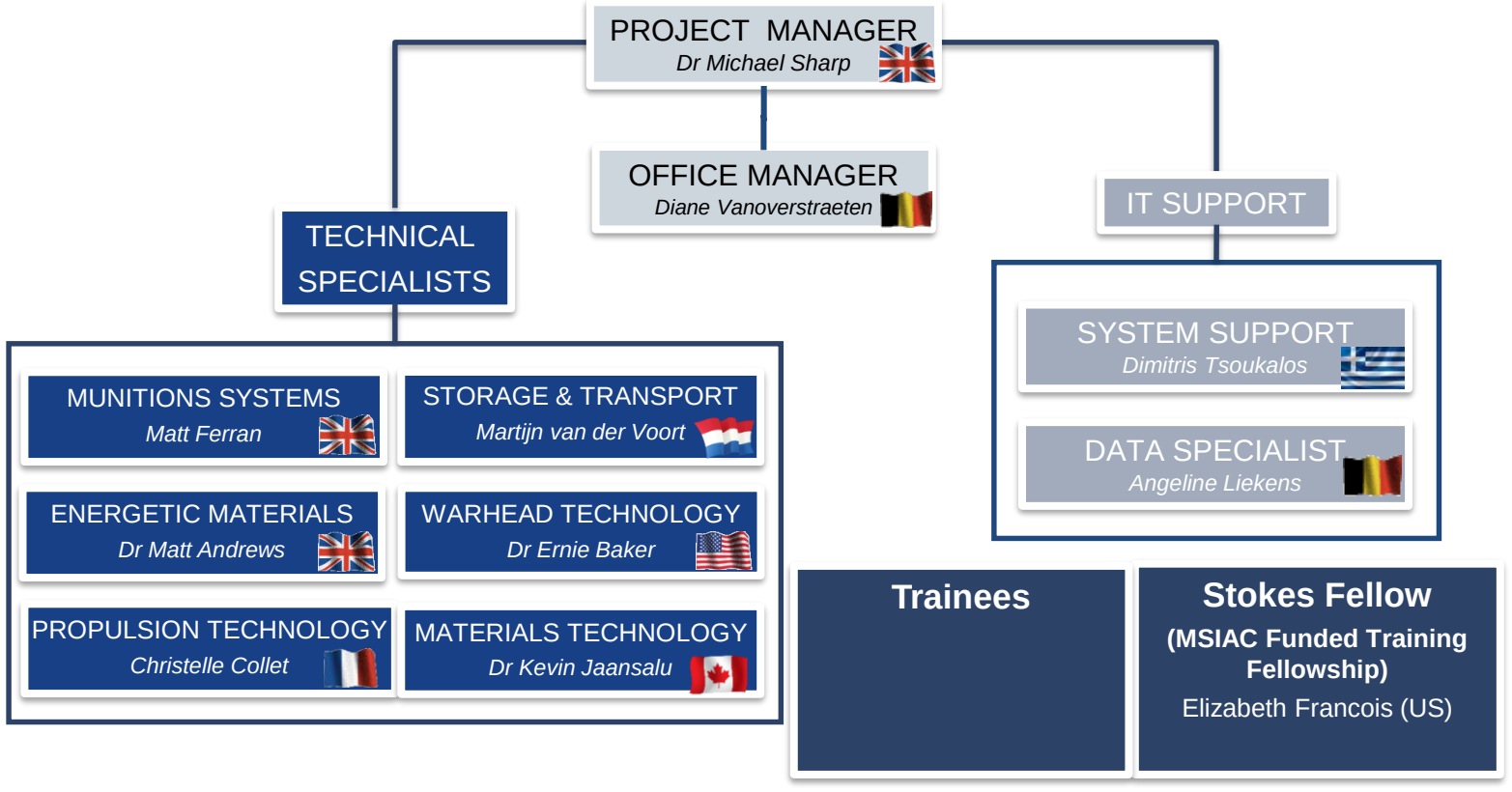
MSIAC Governance

- **MSIAC Strategies, Policies, & Work Efforts Defined by a Steering Committee (SC)**
  - 1 SC Representative per Member Nation, 1 Vote per Member Nation
  - 1 Elected Chairman (non-voting) from a Member Nation

- **15 Members**

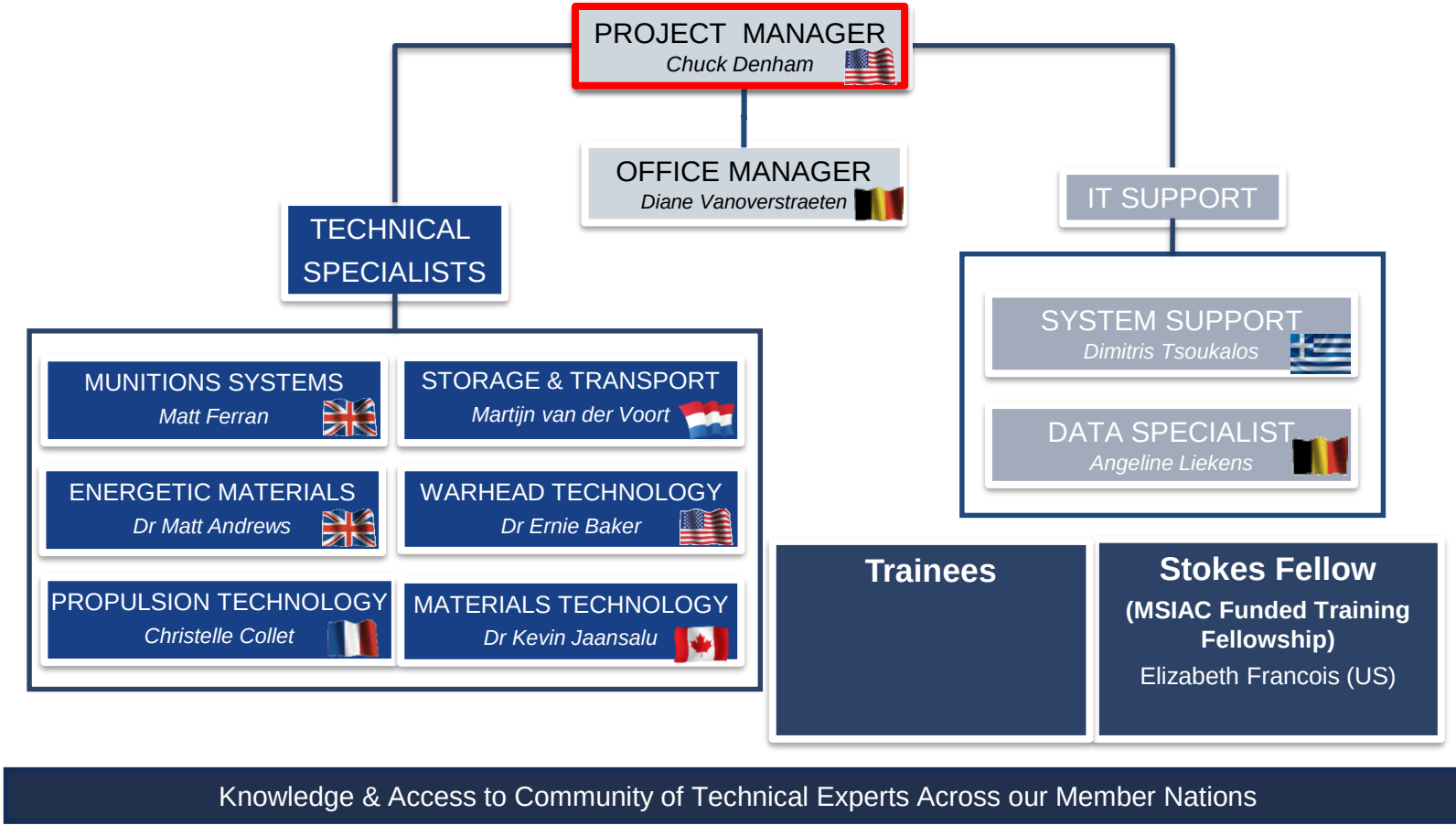


MSIAC Staff



Knowledge & Access to Community of Technical Experts Across our Member Nations

MSIAC Staff



Knowledge & Access to Community of Technical Experts Across our Member Nations

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Workshops

Host & Facilitate Technical Workshops

- Driven by Member Nations' Needs
- Variety of Technical Topics:
  - Member Nations' Requests
  - Specific technical challenges
  - Questions about policy and standards

Workshops & Meeting Plan

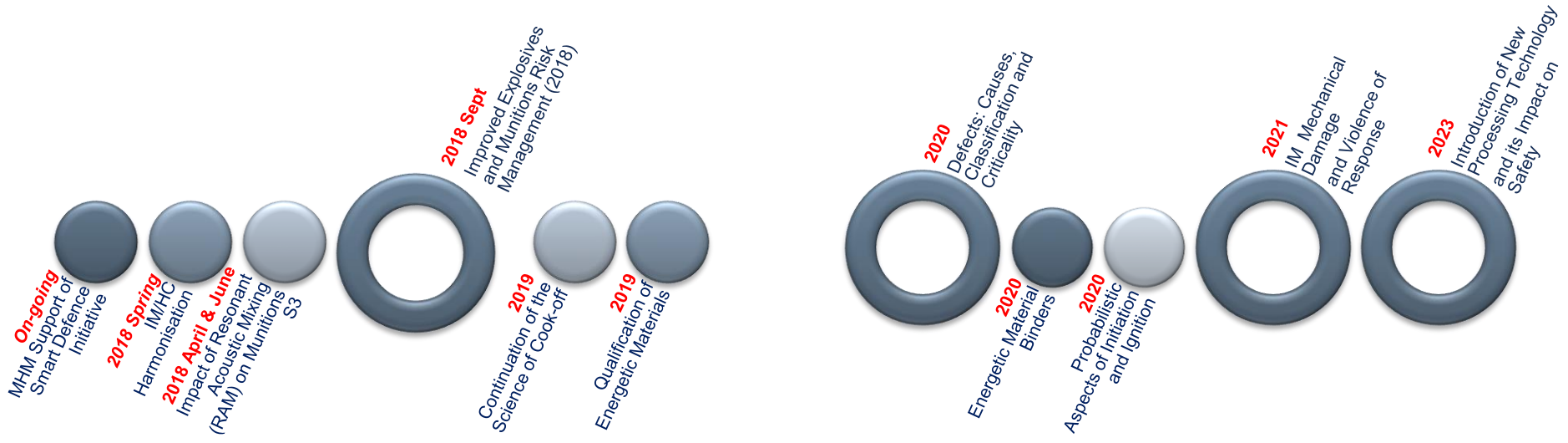
MSIAC Workshop in 2020:

- Defects: Causes, Classification and Criticality

Proposals for years 2021-2023:

- Introduction of New Processing Technology and its Impact on Safety

- IM – Understanding Mechanical Damage and Violence of Response



Workshop – Defects: Causes, Classification, Criticality

Develop methodology by which we approach the problem of defects

- Pulling together of information to inform decisions with respect to the criticality of defects and the sentencing of munitions (i.e. are they S3?)
- How do we formulate a safety argument?
- What are the tools we employ?

Probably best achieved through a overarching discussion group (in parallel to detailed topic areas…)

Presented in more detail during session 8A (11:00)

Technical Meeting on EM Qualification

To direct improvements, seek efficiencies and develop confidence in the qualification process and procedures.

- Reaffirm needs with respect to EM qualification
  - Who are the customers and stakeholders?
  - How is the data used and for what purposes?
- Relationship with other EM requirements (EHDS, SDS, HC)
  - Legal requirements
  - Possibilities to streamline testing
  - Roles and responsibilities
- Processes
  - Who does what?
  - Opportunities to optimise time and resources

DGA

DGA Land Systems,
Bourges, France
18-20 June 2019

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Recent Publications

L-247	Additive Manufacturing for Energetic Materials
L-239	Conclusions from the Improved Explosives and Munitions Risk Management Workshop
L-238	IEMRM Workshop Focus Area 3A: Deployed Missions and Operations & 3B: Storage In The Home Country
L-232	IEMRM workshop Focus Area 1B: Applicability of HD Assignment to Storage
L-231	IEMRM Workshop Focus Area 1A: Improved Criteria for HD Assignment
L-230	Test Methods Applied to Chemical Compatibility, (Releasable to NATO AC/326 SG/A)
L-229	ves
O-207	Reaction Mechanisms for Rocket Motors under Mechanical Insults
O-206	TNT and Blast Equivalency Characterization of Energetic Materials
O-205	Resonant Acoustic Mixing Processing and Safety
O-204	Additive Manufacturing Processes applied to Energetic Materials

Please go to the MSIAC website and have a look:

27 Limited reports and 12 Open reports since last IMEMTS meeting

https://www.msiac.nato.int/contact-access/access-request-form-for-members-of-msiac-nations

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Technical Questions

Answering Technical and non-Technical Questions

- available free of charge to member nations

Questions can easily be submitted using an online form

https://www.msiac.nato.int/products-services/msiac-technical-question-form

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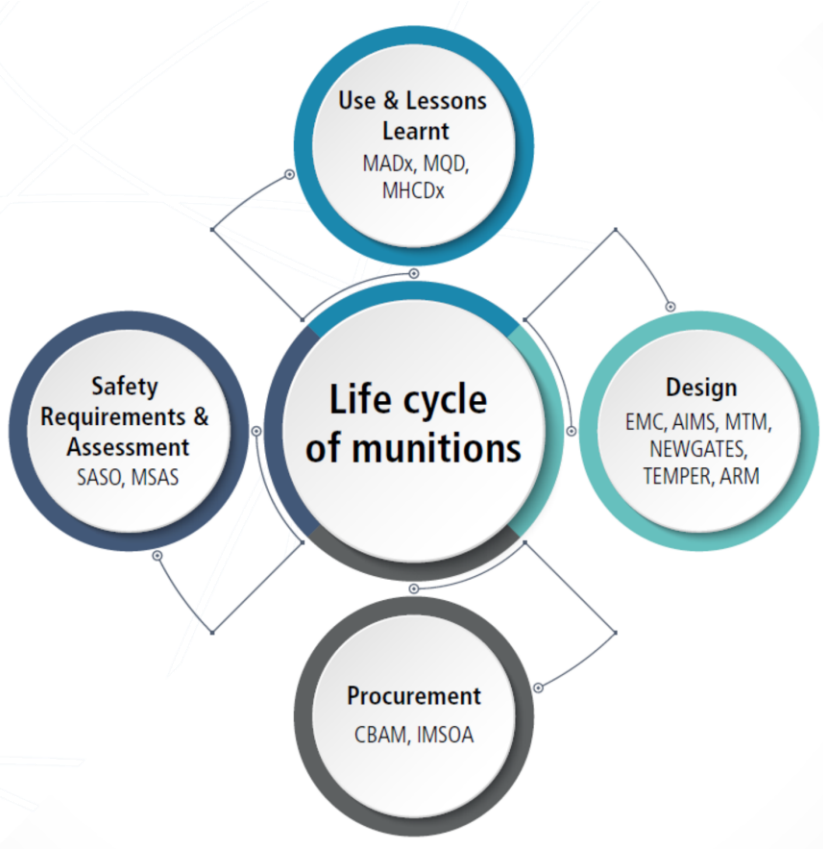
MSIAC Tools

- Large number of products and tools available to MSIAC nations
  - Developed over the last 25 years under NIMIC and MSIAC



The full list of products could be found here: https://www.msiac.nato.int/products-services/products-services

Tools - Website

PORTAL

Advanced IM Search (AIMS)
Web-based platform for quick and easy search of Insensitive Munition Test Results

Energetic Materials Compendium (EMC)
Database providing information on explosives, propellants and pyrotechnics

Mitigation Technologies for Munitions (MTM)
Database providing information on mitigation technologies for munitions

MSIAC Accident Database eXchange (MADx)
Multi-national accident database with government-lead contributions

MSIAC Quantity Distance (MQD)
Consequence analysis tool for storage

Safety Assessment Software (SASO)
Aid in standardisation of the S3 assessment made before introducing munitions into service

WEBLINK

Cost Benefit Analysis Model (CBAM)
Calculate the benefits of introducing IM into munitions inventories

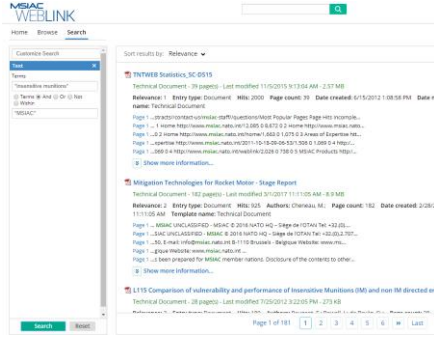
Insensitive Munitions State of the Art (IMSotA)
Snap shot of system improvements and IM technology trends

MSIAC Hazard Classification Database eXchange (MHCDx)
Multi-national hazard classification database with government-lead contributions

Munitions Standards & Safety Database (MSAS)
Library of international and national standards

NIMIC Excel Worksheets on Gap TESts (NEWGATES)
Database of common gap test set ups and test results

Toolbox of Engineering Models for the Prediction of Explosive Reactions (TEMPER)
Tool for the prediction of explosive reactions to IM threats



Undergoing Significant Development

M-STRAD – Database

MSIAC SRAD/TRAD Safety Distance Calculator and Database (MSTRAD)

To assist nations in their efforts to apply correct procedures and precautions to prevent functioning of electrically initiated devices (EID's) in ordnance from electromagnetic radiation (EMR)

- Will store Susceptibility RADHAZ Designator codes (SRAD) for munitions of contributing member nations
  - Multiple packaging / loading configurations
  - Unclassified information (cf. TRAD codes)
- Will calculate safe distances based on TRAD input
  and using look up tables in AECTP-02
- Will be available to contributing nations
  - (FR, UK, US …others)

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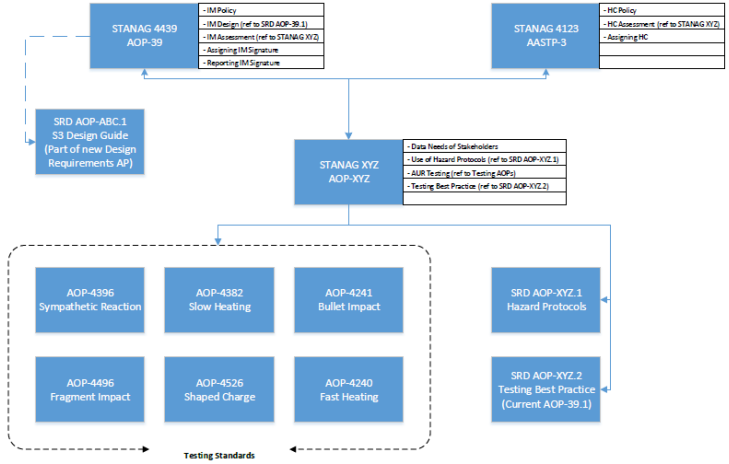
IM/HC Harmonization Update

Goal: To standardize, harmonize and streamline IM and HC policy on requirements and assessment and enshrine this in UN international policy (legislated)

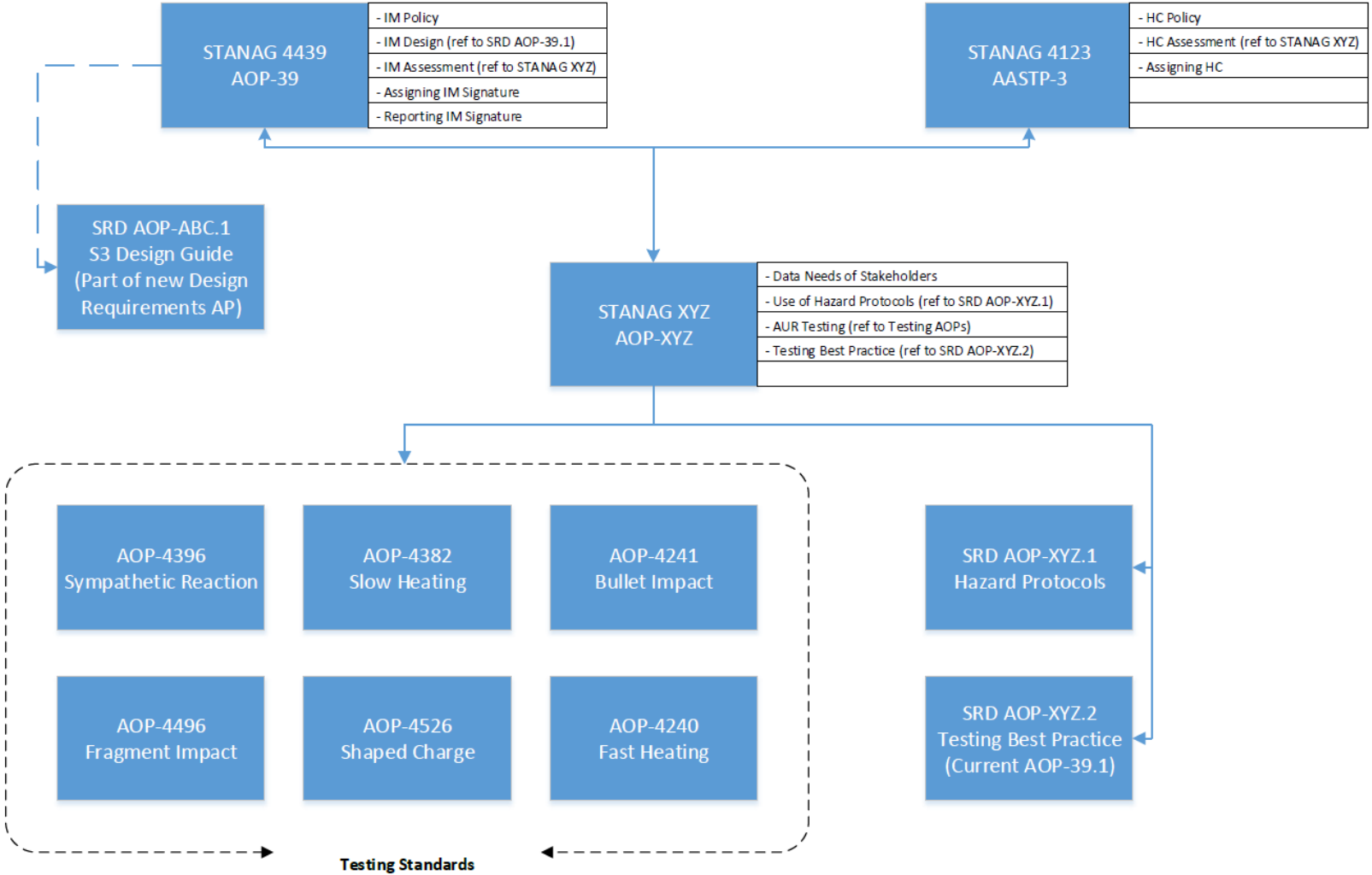
Test Once, use whole body of evidence, increase confidence in assessments, address inconsistencies in application of policy and standards

MSIAC continues to support this effort – Last NATO meeting Koblenz (17th-18th Sep 2019)

- Progress made on restructuring standards
  - AOP-39
  - AASTP-3
  - Introduction of new harmonised testing STANAG / AP
- Opportunity to address areas requiring standardisation
  - NEQ / ENEQ definitions
  - Mode of initiation in stack test
  - Preferred test methods



New Standards Hierarchy



Planning

Next 2 months

- Achieve baseline level of harmonization, establish overall framework, hierarchy of standards etc.
  - Publication of new STANAG / AOP-XYZ (and SRDs)
    - Review and update of current SRD AOP-39.1 (testing best practice)
    - Creation of new SRD based on Hazard Protocols – extracted from current AOP-39
  - Publication of new version of STANAG 4439 / AOP-39
  - Publication of new version of STANAG 4123 / AASTP-3

Next 12-24 Months

- Consider and develop methodology for use of whole body of evidence approach (inc. full scale IM test data) for assignment of Hazard Divisions 1.1 – 1.4, and 1.6
- Consider and develop methodology for the use of “Hazard Types” as a way of expressing hazard in situations other than in peacetime transport
- Work with SG/C to explore viability / need for expressing an “effective” NEQ for siting purposes (e.g. NEWQD in TB700-2)

Future Priorities

Collation and Analysis of IM Test Data

Guidance on Instrumentation for IM and HC Tests

Influence of Mechanical Properties on the Explosiveness of Energetic Materials

Support to Update of STANAG 4297 / AOP-15 on Safety and Suitability for service

Next Generation Polymers and Plasticisers

Ageing Algorithms

Supporting Development of RAM Activities

Review of Risk and Tolerability

Online Hazard Classification Database

Summary

- MSIAC continues to provide support on **Insensitive Munitions** and **Munitions Safety**
- Policy remains an active area for MSIAC with **support provided to AC 326** to facilitate review of standards
- **Workshops** continue to be an important means to help advance munitions safety efforts
- MSIACs Success can be attributed to the excellent collaborative working relationships built across the member nations.