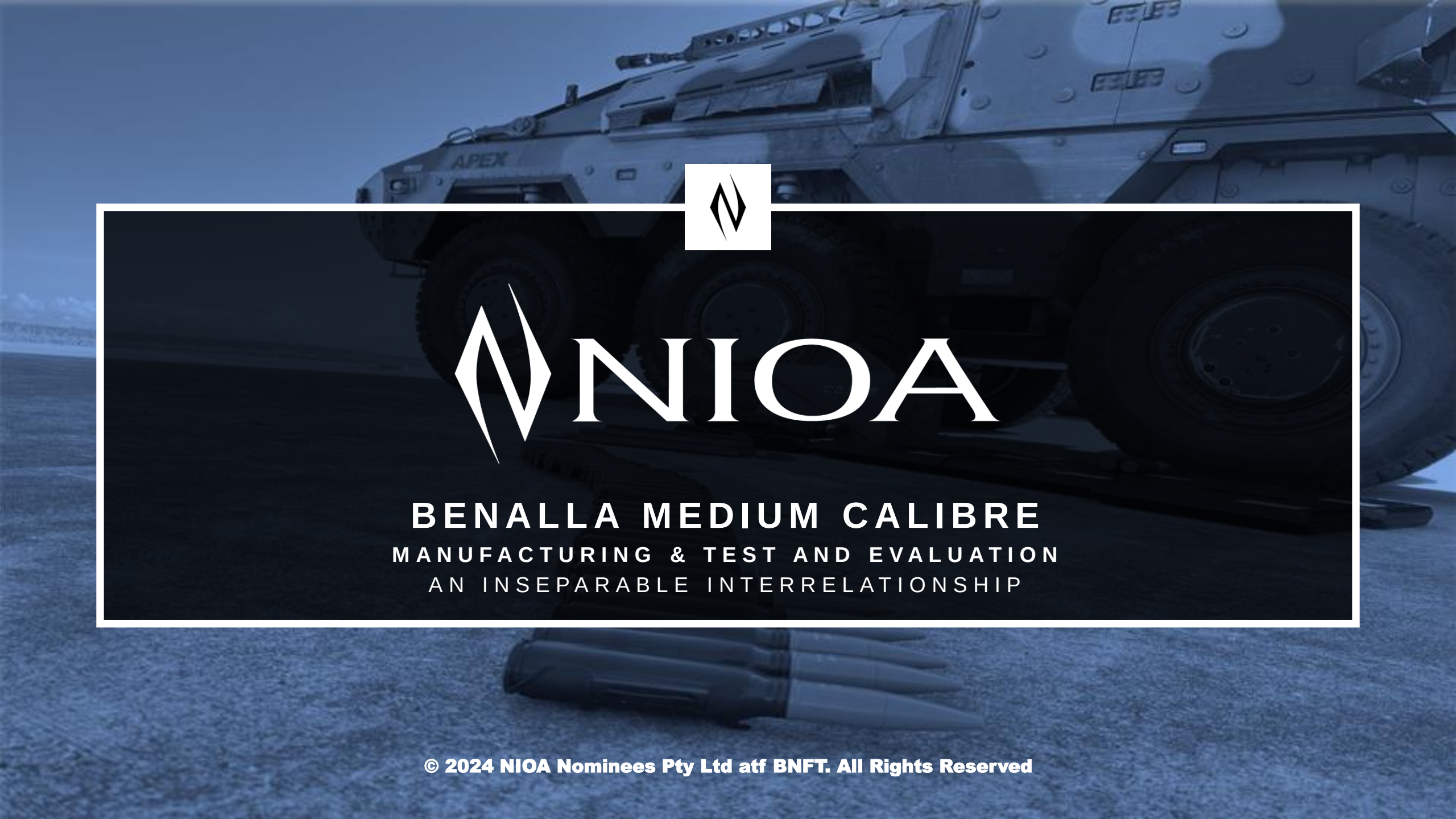


NIOA

BENALLA MEDIUM CALIBRE

MANUFACTURING & TEST AND EVALUATION

AN INSEPARABLE INTERRELATIONSHIP

PRESENTERS / AUTHORS

Mr David Nink

Deputy Chief Engineer at NIOA Australia & New Zealand.

Mr Matthew Hampton

Engineer at NIOA Australia & New Zealand.

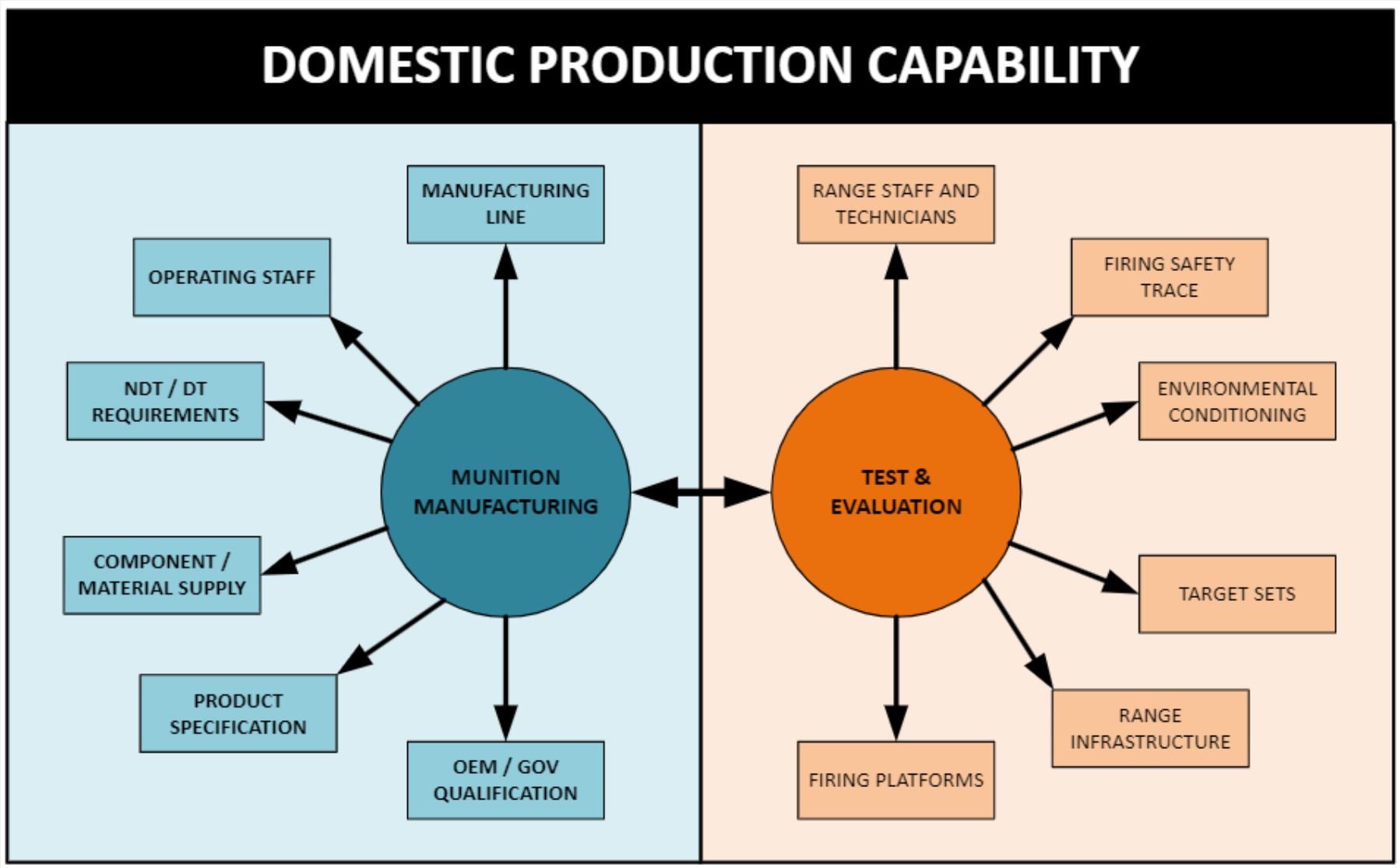
DOMESTIC PRODUCTION CAPABILITY

Reason for pursuing Australian Domestic Munitions Production Capability

- Identified as a critical capability for Australia
- Ensures ‘Supply Surety’ during times of restricted import
- Allows expanded options for Stockpiling critical components
- Offers Australia the opportunity to be a Force Enabler for Allied Partners in the region
- Enables a Stepping Stone approach to domestic Design and Development of munitions, integrating Industry and Academia

WHAT IS REQUIRED FOR A VIABLE DOMESTIC PRODUCTION CAPABILITY?

DOMESTIC PRODUCTION CAPABILITY



DOMESTIC PRODUCTION CAPABILITY

Without a corresponding Test and Evaluation Capability to support a Munition manufacturing line, it is not possible to efficiently Commission, Qualify, Certify or Accept manufactured product or Research and Develop new products for ADF use.

DEFENCE GUIDANCE

The Defence Industry Development Strategy lists seven Sovereign Defence Industrial Priorities (SDIP) and recognizes the criticality of T&E within SDIP 7 – Test and evaluation, certification and systems assurance. This SDIP identifies multiple priority areas of effort to pursue between 2023 and 2030, including the following areas of ***particular relevance*** to munition manufacturing:

- Increasing importance of T&E as Australian domestic manufacturing capabilities grow,
- Expansion of skilled T&E Workforce,
- Innovative use of existing T&E infrastructure to the greatest extent possible; and,
- The importance of close cooperation between Defence and industry.

DEFENCE GUIDANCE

The Defence T&E Strategy, released in August 2021, divides the 2021 – 2030 timeframe between Horizons 1, 2 and 3, focusing on consolidating, modernizing and enhancing the Defence T&E landscape respectively. Noting the completion of Horizon 1 (2021 – 2023), Horizons 2 and 3 most closely relate to this paper, with the relevant areas of effort summarised as follows:

- Horizon 2 (2024 – 2026) – Modernise
  - Developing sovereign T&E facilities with Defence & Industry support
  - T&E Secondments between Defence and Industry; and
  - Conducting T&E using emerging technologies through collaboration between Defence and Industry.
- Horizon 3 (2027 – 2030) – Enhance
  - Sole reliance on Defence T&E infrastructure reduced; and,
  - Shared use of T&E facilities is business as usual.

DESIGN CONSIDERATIONS

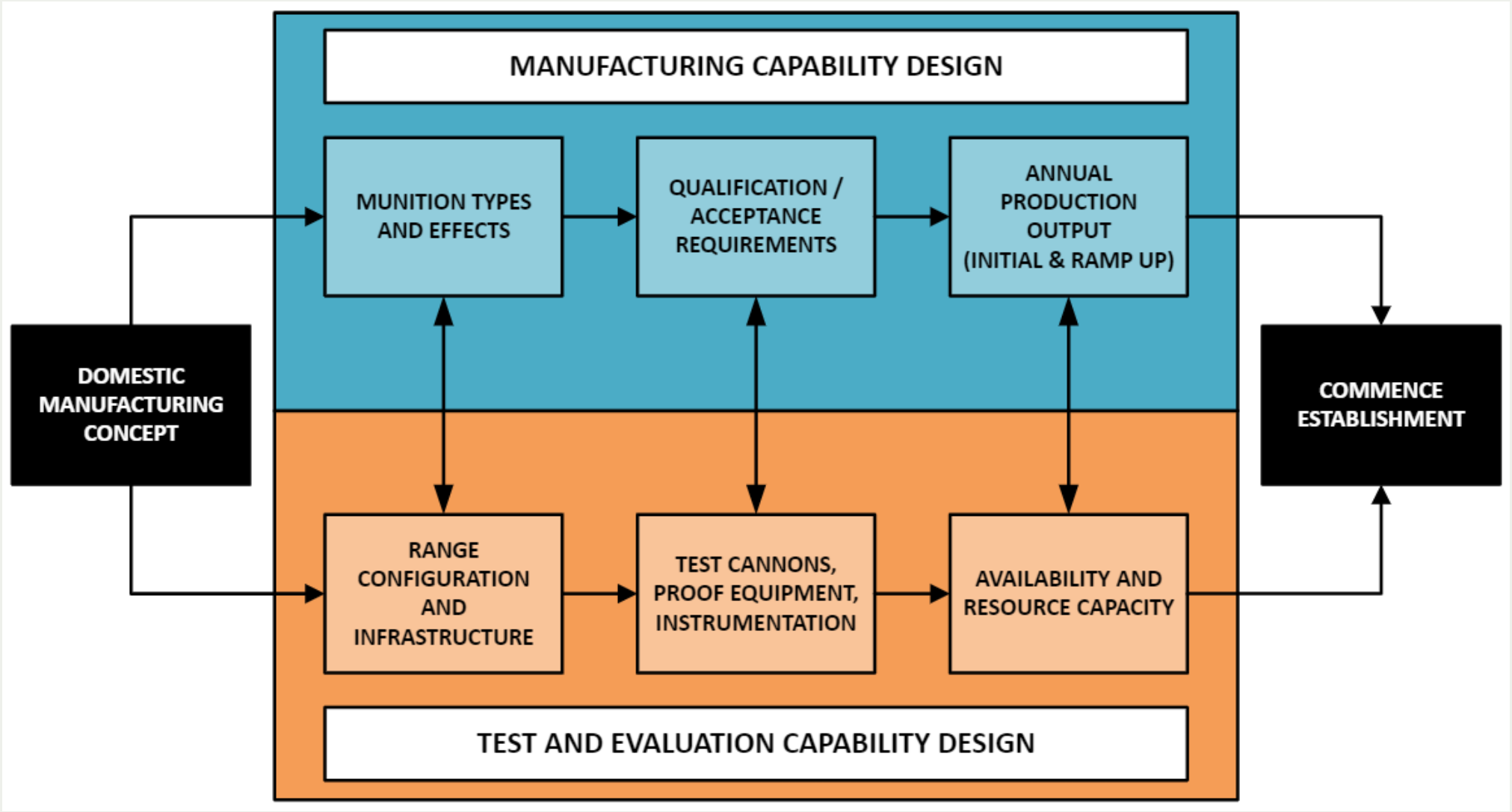
It is not viable to establish and maintain a domestic munitions manufacturing capability without the corresponding T&E capability to support, Qualification, Commissioning, Certification & Acceptance.

Key considerations for development of infrastructure and range equipment when supporting munition proofing activities are:

- Maximum / Minimum Range and Elevation
- Target Sets
- Firing Qty and Cadence
- Platform Type
- Data Capture
- Meteorological Restrictions

HOW DOES THE MUNITIONS OEM FIT INTO THESE CONSIDERATIONS?

DESIGN CONSIDERATIONS



BENALLA MEDIUM CALIBRE
CASE STUDY

- Collaboration between NIOA, RNM, RWMS for Manufacturing Line establishment.
- Joint Proof & Experimental Unit (JPEU) P&EE Graytown, L400 Phase 2 Project Office for Proof Cannon Commissioning.
- Program initiated as separate streams of effort, however, quickly became a unified approach to support end outcomes and schedule.
    - Production at Benalla GOCO Facility
    - CWE / EPVAT / Precision Firings at P&EE Graytown
    - Function and Casualty Firings at Wide Bay Training Area

BENALLA MEDIUM CALIBRE
CASE STUDY

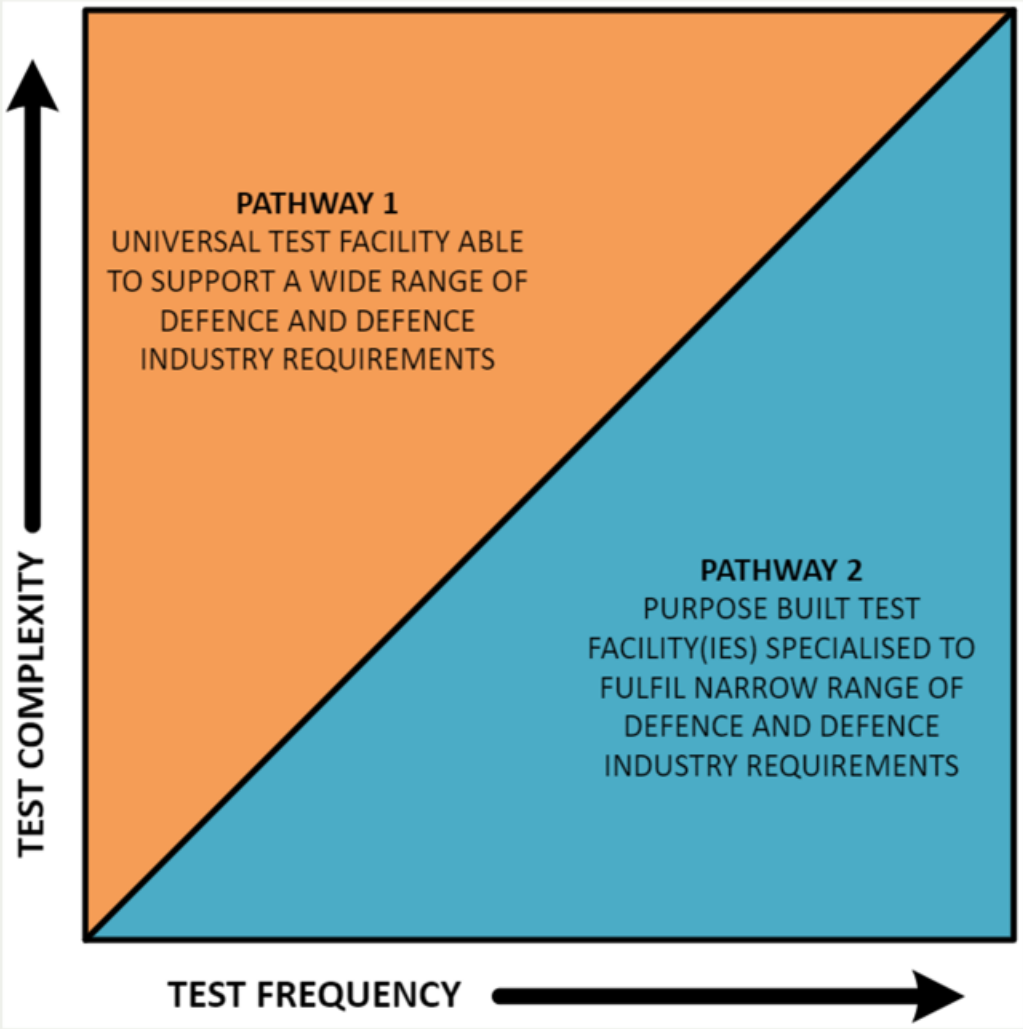
T&E EXPANSION

When investigating the options for enhancement of domestic T&E capabilities, there are two primary methodologies, these being:

- **Pathway 1:** Increasing the range and complexity of activities able to be completed by new (or extant) T&E facilities (both Government and Commercial) to fulfill a wide range of domestic test requirements. Or

- **Pathway 2:** Increasing the capacity of the Australian T&E landscape to allow increased occurrence of T&E activities through simplified purpose-built capabilities

Typically, Munitions Manufacturing requires frequent but 'relatively' simple test activities to support production.



T&E EXPANSION

CORE CONSIDERATIONS FOR PROOFING T&E SUPPORT	
PROXIMITY	DISTANCE FROM MANUFACTURING LOCATION TO PROPOSED T&E SITE
AVAILABILITY	CAPACITY TO CONDUCT ROUTINE FIRINGS DURING NORMAL SERIAL PRODUCTION, WHILE ALSO CONDUCTING POTENTIAL COMMISSIONING AND / OR QUALIFICATION FIRINGS AND DEVELOPMENT PROGRAMS
SUPPORTABILITY	IS CURRENT INFRASTRUCTURE SUITABLE TO CONDUCT ALL REQUIRED FIRINGS OR IS THERE ABILITY TO SUPPORT SITE UPGRADES
SUSTAINABILITY	CAN THE SITE SUSTAIN A SKILLED WORKFORCE NOT ONLY FOR FIRING BUT TO MAINTAIN EQUIPMENT AND INFRASTRUCTURE
CAPABILITY	WHAT OUTCOMES ARE REQUIRED TO ADEQUATELY SUPPORT MUNITIONS MANUFACTURING

INDUSTRY INVOLVEMENT

Defence Industry Involvement. Munition OEMs have a responsibility to support T&E providers where possible, particularly, as noted within this presentation;

- Understanding T&E requirements to support munitions manufacturing and be self-aware of landscape to inform and support.

- Ensuring where applicable, international best practice is mirrored in Australia and maintain access to International OEMs and T&E providers for Skill Transfers and training opportunities for Australian practitioners.

- Take an Active Role for the conduct of Proofing T&E to support Defence or Commercial Entities, to alleviate strain on extant Australian T&E providers.

THOUGHTS FOR CONCLUSION

THE ESTABLISHMENT OF THE BENALLA MEDIUM CALIBRE MANUFACTURING CAPABILITY AS A JOINT EXERCISE BETWEEN MUNITIONS MANUFACTURER AND T&E PROVIDERS HAS DEMONSTRATED THE COMPULSORY NATURE OF THIS RELATIONSHIP TO SUCCESSFULLY REALISE PURSUED OUTCOMES FOR THE AUSTRALIAN DEFENCE FORCE

THANK YOU

Thank-you for attending today's session!

Other NIOA Presentations (Wed, 20 Nov – Thu, 21 Nov)

Title	Presenters	Session Details/Presentation Time
Benalla medium calibre manufacturing and 30 x 173mm manufacturing, 'The installation and operation of a Modern multi-calibre LAP line' **[NTP-Part 1]**	Dr. Emma Coen Mr. Jeff Gordon Mr. Andrew Kay	Session 3B - Manufacturing **Wednesday,** Nov 20, 2024 9:50 AM - 10:50 AM Bradman Theatre [Presentation Time **10:20 AM - 10:50 AM**]
Benalla medium calibre manufacturing and test and evaluation, an inseparable interrelationship **[This Presentation – NTP-Part 2]**	Mr David Nink Mr Matthew Hampton	Session 4C - Regulation and Risk Management **Wednesday,** Nov 20, 2024 11:20 AM - 12:50 PM Menzies Theatre [Presentation Time **11:20 AM - 11:50 AM**]
Cross qualification, the pathway to higher levels of interoperability **[NTP-Part 3]**	Mr Rudi Bekker Mr Peter Schaumburg	Session 6A - Risk Management / Interoperability **Wednesday**, Nov 20, 2024 4:00 PM - 4:30 PM Royal Theatre [Presentation Time **4:00 PM - 4:30 PM**]
National Australia Explosives Laboratory (NAEL)	Mr. William E. Post (SMS) Mr. Kirt N. Sasser (SMS) Dr. Emma Coen	Session 7C - Test Evaluation **Thursday**, Nov 21, 2024 10:10 AM - 12:10 PM Menzies Theatre [Presentation Time **11:10 AM - 11:40 AM**]
Successful integration of process hazards analysis into manufacturing and testing of explosives materials and articles	Mr. Scott E. Genta (SMS) Mr. William E. Post (SMS) Mr. Jeff Gordon	Session 7C - Test Evaluation **Thursday,** Nov 21, 2024 10:10 AM - 12:10 PM Menzies Theatre [Presentation Time **11:40 AM - 12:10 PM**]

AUTHORS

About NIOA

NIOA is a family-owned global firearms, weapons and munitions company. Our operations include NIOA Australia, NIOA New Zealand, the Australian Missile Corporation, Barrett Firearms (USA) and joint venture company Rheinmetall NIOA Munitions. Since our early beginnings in regional Queensland, Australia in 1973, we have always been driven by loyalty, trust, serving people and exceeding their expectations. That means delivering world-leading products and technologies for the benefit of our customers wherever they are around the globe. NIOA is the largest privately-owned supplier of munitions to the Australian and New Zealand Defence, Law Enforcement, and Commercial markets.

US-based Barrett Firearms, the most recent addition to our group, is the world leader in long range, large calibre precision rifle manufacturing, supplying the US military and more than 75 US Department of State approved countries around the world, as well as law enforcement agencies and sport shooter.

About the Author(s)

Mr David Nink is the Deputy Chief Engineer at NIOA Australia and has been heavily involved in the Test and Evaluation (T&E), certification and manufacturing of munitions for ten years. David has a bachelor's degree in Mechanical Engineering, and an advanced diploma in Engineering Technology and is chartered by Engineers Australia specializing in Mechanical Engineering.

Mr Matthew Hampton is an Engineer at NIOA working predominantly on the Test & Evaluation (T&E) of small arms weapon systems and munitions. Matthew has a bachelor's and master's degree in Chemical and Materials Engineering and is chartered by Engineers Australia specializing in Chemical Engineering and Systems Engineering.

NIOA

FIND US ON

www.nioa.com.au