

## RA 4657 – Weapon Loading and Armed Aircraft Maintenance

### Rationale

Military registered Aircraft<sup>1</sup> may have the need for preparation, Loading and unloading of munitions<sup>2</sup> for operational and / or training requirements. Once loaded, Maintenance of that Armed Aircraft may be necessary to achieve the operational task. Without defined Safety precautions and appropriately trained and Competent personnel to load<sup>3</sup> munitions, there is a Risk of Inadvertent Release or firing of an Aircraft's weapons which could Cause extensive damage and Risk to Life. ► This RA ◀ details the Safety precautions and training, Competence assessment and Authorization requirements for personnel involved with the Loading of munitions, Maintenance and parking of Armed Aircraft.

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### Regulation

#### 4657(1)

#### Armed Aircraft Maintenance

4657(1) The Military Continuing Airworthiness Manager (Mil CAM)<sup>4</sup> **shall** ensure that ► aviation engineering ◀ orders and / or ► local ◀ procedures<sup>5</sup> are issued to strictly control the Maintenance, Loading and parking of Armed Aircraft.

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#### Armed Aircraft Maintenance

1. The ► aviation engineering ◀ orders and / or ► local ◀ procedures<sup>5</sup> **should** be promulgated by Approved Maintenance Organizations (AMO) in the Maintenance Organization Exposition (MOE)<sup>6</sup> or by Military Maintenance Organization (MMO) in Aviation Engineering Standing Orders (AESOs) ► or equivalent. ◀
2. The ► Mil CAM<sup>4</sup> aviation engineering ◀ orders and / or ► local ◀ procedures<sup>5</sup> **should** detail:
  - a. The requirements for Armed Aircraft that have been diverted, including diversions to non-MOD Airfields.
  - b. ► Processes ◀ for performance failures of Aircraft munitions, Explosive Components or related equipment.
3. Other than flight servicing, munitions **should** be unloaded prior to any Maintenance activity being carried out on the Aircraft. However, in exceptional circumstances and if an operational imperative exists, there may be some permissible Maintenance activities that can be carried out on Armed Aircraft. These activities are detailed in the relevant Technical Information<sup>7</sup> (TI) or can be authorized by Commands, but Authorization **should** be granted prior to any work being undertaken by an appropriately authorized individual<sup>8</sup>.
4. The individual authorizing these permissible Maintenance activities on an Armed Aircraft **should** conduct a Risk Assessment on each occasion. Factors to be considered include but are not limited to:
  - a. The likelihood and Risk of an Occurrence and the outcome.
  - b. The operational sortie imperative.

<sup>1</sup> Refer to ► RA 1161 – Military Registration of Air Systems Operating within the Defence Air Environment. ◀

<sup>2</sup> Refer to DSA03 – Ordinance, Munitions and Explosives (OME), Part 2. A complete device, charged with explosives, propellants, pyrotechnics, initiating compositions or nuclear, biological or chemical material, for use in military operations.

<sup>3</sup> Load also includes the activities of munitions preparation and unloading for the purpose of this Regulation.

<sup>4</sup> Refer to RA 1011 – Military Continuing Airworthiness Manager Responsibilities.

<sup>5</sup> ► Refer to RA 4009 – Aviation Engineering Orders and Local Procedures. ◀

<sup>6</sup> Refer to RA 4816(1): Content of a Maintenance Organization Exposition (MRP 145.A.70(a)).

<sup>7</sup> Refer to RA 4810 – Technical Information (MRP 145.A.45).

<sup>8</sup> Refer to RA 1006 – Delegation of Engineering Authorizations.

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- c. The nature of the weapon load.
  - d. Additional Safety precautions that may be required, such as enhancing supervision or additional fire / rescue assets.
5. Armed Aircraft **should** only be parked at locations or facilities that have a valid Explosives Licence<sup>9</sup>.
  6. For ship hangars – Direction on stowage of Armed Aircraft in ships hangars is detailed in BRd 862(1) MOD Maritime Explosive Orders Vol 1 (Surface Ships).
  7. A formal system **should** be in place whereby unit weapons and air movements staff are advised whenever a thunderstorm level / risk high or moderate is declared by the responsible meteorological office<sup>10</sup>. If declared, munition Loading in progress, including the return of explosives to their normal storage sites, **should** be completed as a priority and no further weapon Loading commenced unless authorized.
  8. If munition Loading to an Aircraft is operationally essential in thunderstorm level / risk high, a dynamic Risk Assessment **should** be carried out taking into consideration the susceptibility of the munitions to lightning strike<sup>11</sup> and authorized by the operational commander<sup>12</sup>. Additionally:
    - a. The activity **should** be conducted in a facility that has a compliant Lightning Protection System.
    - b. If conducted within a Hardened Aircraft Shelter (HAS), the HAS doors are to remain closed to prevent blast and fragmentation propagation.
  9. Implementation of operational arming<sup>13</sup> **should** only be authorized by the operational commander<sup>12</sup> when operationally essential, no other arming options are available and that an appropriately authorized Safety case has been developed<sup>11</sup>. Operational arming **should** only be carried out by an authorized person<sup>14</sup>. Wherever possible, duplicate Safety devices **should** be stowed in the Aircraft prior to taxiing to avoid the need to open panels / stowage.

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10. Where there is a requirement to park an Armed Aircraft at a location or facility that does not have a valid Explosives Licence, the following actions are required:
  - a. An OME Risk Assessment must be carried out<sup>11</sup>.
  - b. The appropriate Head of Establishment and Inspector of Explosives will be notified, seeking their advice, with the aim of being issued an Explosives Licence Waiver for that activity;
  - c. Parking must meet the requirements of explosives Regulations<sup>9</sup>, safe Heading for directional weapons and Flare Danger Areas will be achieved;
  - d. The Aircraft will remain in the Initially Armed state; and
  - e. There will not be any Maintenance activity carried out.

<sup>9</sup> Refer to DSA 03 – OME, Part 2, Defence Code of Practice ►◄ for In-Service and Operational Safety Management of OME, Chap 10, Sect 5.

<sup>10</sup> Refer to RA 3301(2): Meteorological Information Requirements.

<sup>11</sup> Refer to DOSR Publication 001, Guidance on completing Risk Assessment for Explosives Activity.

<sup>12</sup> Refer to RA 1020 – Aviation Duty Holder and Aviation Duty Holder-Facing Organizations - Roles and Responsibilities.

<sup>13</sup> A modified arming procedure, adopted to allow an armed Aircraft to taxi in the finally armed state, to a location with a safe heading, where safety devices are then removed in accordance with (iaw) TI. Also referred to as, end of runway arming.

<sup>14</sup> Refer to RA 4806(5): Personnel Competences and Authorization (MRP 145.A.30(e)).

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**Weapon Loading Personnel Requirements**

4657(2) The ►Chief Air Engineer (CAE)<sup>15</sup> and / or the ◀ Mil CAM<sup>4</sup> ► shall ensure that ►aviation engineering◀ orders and / or ►local◀ procedures<sup>5</sup> are issued, controlling the Loading of munitions to Aircraft by trained, Competent and Authorized personnel<sup>16</sup>.

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**Weapon Loading Personnel Requirements**

11. ►The CAE<sup>15</sup> and / or the Mil CAM<sup>4</sup> aviation engineering◀ orders and / or ►local◀ procedures<sup>5</sup> ► should be promulgated by the AMOs in the MOE<sup>6</sup> or by the MMO in AESOs ► or equivalent.◀
12. The ►CAE<sup>15</sup> and / or the Mil CAM<sup>4</sup> aviation engineering◀ orders and / or ►local◀ procedures<sup>5</sup> for the Loading of munitions ► should include as a minimum:
  - a. The number and composition of Loading teams for each munition.
  - b. Personnel Competence and Authorization requirements<sup>14</sup>.
  - c. The requirements and responsibilities for training, assessing Competence and the awarding of Authorizations<sup>14</sup>.
  - d. Details of any non-explosive and non-expendable stores that are to be subject to similar requirements as munitions.
13. Maintenance personnel authorized to load munitions to Aircraft ► should be subject to adequate recurrent training to ensure continued Competency.

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**Weapon Loading Personnel Requirements**

14. When preparing for war fighting or enduring armed operations, or due to the nature of the working environment, it may be appropriate to increase the frequency of Competency checks.

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**Weapon Loading Training Requirements**

4657(3) The ►CAE<sup>15</sup> and / or the ◀ Mil CAM<sup>4</sup> ► shall ensure that ►aviation engineering◀ orders and / or ►local◀ procedures<sup>5</sup> are issued detailing that munitions load training is carried out in a realistic and representative environment<sup>16</sup>.

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**Weapon Loading Training Requirements**

15. Wherever possible, weapon load training ► should be performed on Serviceable Aircraft. Where a Serviceable Aircraft is not available, it is acceptable for the Aircraft to have other Faults, not relating to the armament system, but their presence ► should not impede the training. The Aircraft Armament System ► should be Serviceable.
16. Weapons used to carry out training and Competency checks ► should be fully representative. When using drill or training weapons, the ►processes◀ and precautions ► should be followed as if a live load is being carried out.

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**Weapon Loading Training Requirements**

17. The ►CAE<sup>15</sup> and / or the ◀ Mil CAM<sup>4</sup> ► in conjunction with the Type Airworthiness Authority, may authorize the use of training Aircraft or training rigs,

<sup>15</sup> ► Refer to RA 1023 – Chief Air Engineers – Air Safety Responsibilities.

<sup>16</sup> Sponsorship of each aviation engineering order and / or local procedure is to be clearly documented iaw RA 4009(1): Aviation Engineering Orders and Local Procedures.◀

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provided that training can be carried out safely and in a manner representative of the real Aircraft.