



New Generation Incendiary Machines Background and Progress Summary

For Information

DSE has for many years been operating aerial incendiary 'ping pong' machines used in the light helicopter fleet. These machines have been in service since 1978 and a project to replace these machines has been under way for some time. Evaluation is investigating the operation and performance following incendiary machines: Unit 1. ARLOS Pneumatic Incendiary Machine and Unit 2. Skyworks R2 Electric Incendiary Machine.



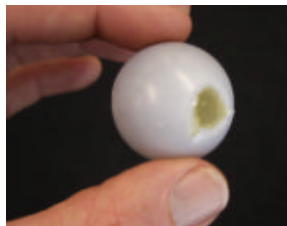
The ARLOS Pneumatic Incendiary Machine (left) requires compressed air to operate. It is the first of its kind, being powered by compressed air instead of electricity. This offers many advantages in output power, simplicity in design and reliability. Initial prototypes of the machine used a portable compressor carried on-board the helicopter, the version being operated uses compressed air sourced from the helicopter's gas turbine engine. Each contract Type 3 helicopter will be fitted with an approved compressed air outlet for use by this machine.

The Skyworks R2 Electric Incendiary Machine (right) operates using the standard electrical outlets within the helicopter. It is an electric powered machine that features a compact design and construction 30cm wide and 50cm high. It dispenses 'caplets' instead of 'ping pong' balls, which use the same potassium permanganate crystals. The "caplet is a small vacuum formed cup with a clear plastic covering to contain the crystals. This offers more efficient packaging as well as eliminating issues with needle penetration of the caplet.



Each one of the machines was bench and field tested in July, 2005. Following these tests a number of modifications were required by DSE and addressed by the suppliers during the second half of 2005. The Department has now taken delivery of one of each of the machines for final field-testing. As both of these machines have distinct advantages over the other, the evaluation process will be extended to encompass additional field-testing over the 2006-burning season.

The ARLOS Pneumatic Incendiary Machine utilises the incendiary balls (right) used by the current incendiary machines; "ping pong balls".



The Skyworks R2 Electric Incendiary Machine utilises an incendiary caplet (left) developed and supplied by the manufacturer of the R2 machine.





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Regulations

The regulatory environment for aircraft operations has changed dramatically since the introduction of the first incendiary machines in 1978. This has made the process of implementing a new generation incendiary machine a complicated process. The contents of an incendiary capsule (potassium permanganate) are a Class 5 Dangerous Good and carriage on an Australian registered aircraft is forbidden. To assess the legal ramifications of helicopter incendiary operations, an investigation was conducted covering all aspects of the operation, including;

- Legal provisions allowing the carriage of dangerous goods
- Legal provisions covering the dropping of articles from aircraft
- Requirements of the helicopter operator to consign and carry Dangerous Goods and conduct incendiary operations
- The requirements of pilots and DSE staff in respect to Dangerous Goods certification and training
- The packaging and transport of Dangerous Goods
- The certification and approval of incendiary machines and installation systems
- The installation and removal of incendiary equipment by pilots and DSE staff

The introduction of these machines will be done in a manner to ensure the safety of both Departmental staff and aircrew and this investigation was most important in establishing a proper framework for the implementation process.

Incendiary Machine Installation in Helicopters

While the assessment of the two new machines has been the main focus, the installation of these machines in the helicopter has become a special project on its own. In the early days of helicopter incendiary work, DSE worked with one operator almost exclusively. This operator, who claimed some propriety of the development, developed the mounting systems for the incendiary machines. In later years as other operators were involved, issues developed with the sharing of this information. To avoid issues like this in the future, DSE has sponsored the development of mounting systems for the Jet Ranger and Squirrel helicopters to be used by both types of new incendiary machines. This will ensure the correct certification of the machines and systems as well as ensuring uniformity through out the fleet. The response from the operators has been very positive. Designs for both types of aircraft have been complete and are now being forwarded for CASA certification.

Incendiary Machine Certification and Implementation

When the old incendiary machines were first introduced they were considered 'role equipment' and were treated as a piece of cargo in the aircraft. Currently, anything, which is bolted to an aircraft, is considered a piece of aircraft equipment and must be treated as such. A CAR35 engineer as delegated by CASA must certify the new incendiary machines. This process examines the structure and operation of the machine with respect to safety in the aircraft throughout the flight envelope. This process has been completed for the R2 machine and is currently in now in progress for the Arlos machine. In addition a system of maintenance for the machines must be certified and documented with only approved personnel to work on the machines.

The machines must be installed in the aircraft using a CASA certified mounting system. As mentioned above, this system has been designed and is in the process of being certified. Once the system design has been approved, each individual aircraft must have the mounting system installed and separately certified.

Compressed Air Systems in Helicopters

The system for delivering compressed air to the incendiary machine must be designed and certified by CASA before installation. In the same manner as the mounting systems above, the Department has sponsored the design of this system and will forward this for certification. Once it is certified, the Department will 'own the rights' to it and will make it available to each of the state fleet operators. Again this will ensure installed systems are certified and uniform across the fleet.

Rollout of the New Incendiary Machines

Once the primary certification of the incendiary machines is complete, the implementation will occur on an aircraft by aircraft basis. Each aircraft will require the mounting system installed and certified and the compressed air system installed and certified. Finally a review of the contractor's Operations Manual must be done to ensure requisite sections are covered. As such, the rollout of these new machines will be a gradual process, dependant on not only the incendiary machines but on availability of aircraft, engineering resources and the inertia in the CASA certification process.

If you have any queries in relation to this matter please contact Don Relf, State Aircraft Unit, telephone 03 94124888.