APPENDIX 2-1

Principles for the Approach to Regulatory Determination

The UK document CAP 722 – Guidance for the operational of UAV systems has been used as basis for the principles of equivalents and transparency.

1 Assumptions

All assumptions should be made explicit and challenged

It should not be assumed that because something has been considered to be adequate for one type of system that it would be necessarily adequate for another type of system. Many assumptions made during the evolution of manned systems may not hold for UAV systems and vice versa.

2 Best practice

The development of UAV system regulations is an opportunity to improve the safety for all airspace users through the adoption of best practice from both non-UAV and UAV system developments and operations.

UAV system development will bring with it new technology that could enhance existing operations as well as make UAV system operations safe and secure. However a thorough understanding of existing best practice is required so that the lessons in the evolution of the present aviation industry are incorporated.

3 Equivalent risk

UAV operations outside a restricted area shall not increase the risk to existing users and shall not deny airspace to them.

UAV operators should recognise the expectations of other airspace users. This means ensuring that equivalent behaviour and responses are made so that Air Traffic Units and other airspace users can determine courses of action as they would for any other air user in all equivalent circumstances. Risk in this context is heavily focussed on safety and the need to avoid loss of life, although exclusion of air users from airspace can be for security reasons.

4 Equivalent Compliance

UAV operators must ensure that their aircraft show an equivalent level of compliance with the rules, which apply to manned aircraft.

The present situation is that rules already exist for the development and operation of aircraft. The introduction of UAV systems in the first instance should strive to comply with these existing rules. There is a need to ensure that where rules do have to change in future that both manned and unmanned aircraft are treated similarly and that divergence in any future rule making is kept to an absolute minimum.

This applies to both compliance for the airworthiness of UAV systems as well as compliance for their safe and secure operation.

5 Equivalent Operations

UAV operators should seek to operate within existing arrangements.

Existing arrangements can be at a local, national or regional level and are those arrangements that are currently in place and used by manned aircraft. However it is recognised that the introduction of UAV systems may bring with it special circumstances

where these arrangements may not be able to be complied with and that changes to these arrangements will be sought.

Arrangements may be in place specifically for reasons of safety and/or security.

6 Transparency

The provision of an Air Traffic Service (ATS) to a UAV must be transparent to the Air Traffic Control (ATC) controller.

The controller must not have to do anything different using Radio Telephony or landlines than he would with other aircraft under his control. Nor should he have to apply different rules or work to different criteria. UAVs must be able to comply with ATC instructions and with equipment requirements applicable to the class of airspace within which they intend to operate.

7 Regulatory compliance determination

The determination of the airworthiness of a UAV is a separate function from the determination of UAV systems safe and secure operation.

The ability of an aircraft to be fit for flight and to fly in a safe manner is separate from the ability of the aircraft to be flown safely. The first two require a thorough understanding of flight technology and its applications, whilst the latter requires a thorough understanding of operations in various defined environments.

The current regulatory environment does not address manned aviation in a total systems way and so the concept of treating a UAV system in a total systems way is against the principle of equivalent compliance.

The term "airworthiness" in relation to a UAV System refers to the airborne element of the system i.e. the air vehicle. Certification of a UAV system encompasses the ground based systems that are a fundamental part of the communications, command and control of the system. The system may include more than one air vehicle.

The infrastructure required to support the safe operation of a manned aircraft is not part of the certification process although it is part of the regulatory process, i.e. Airport systems, Area Traffic Control systems etc. are not included in the type certificate of an aircraft even though they are a fundamental part of the system that ultimately ensures its safe operation.

8 Legal responsibility

The legal responsibility for aircraft safe operation within a UAV System resides with a designated person.

In International law the Commander of the aircraft bears ultimate responsibility for the safe operation of the aircraft for which they are in charge. Although the Captain of the aircraft is normally the pilot and takes on this responsibility, this does not have to be the case. For a UAV System it is essential that the responsibility of the Commander be recognised in the operational structure on the ground.

There is some evidence accruing that suggests that the Commander in the air in certain circumstances is finding it difficult to discharge this responsibility where significant assistance is not available. Under Visual Flight Rules, Collision Avoidance is becoming increasingly difficult where there exist high traffic densities with increased pilot workload, poorly equipped aircraft and cockpits with significant visual restrictions.